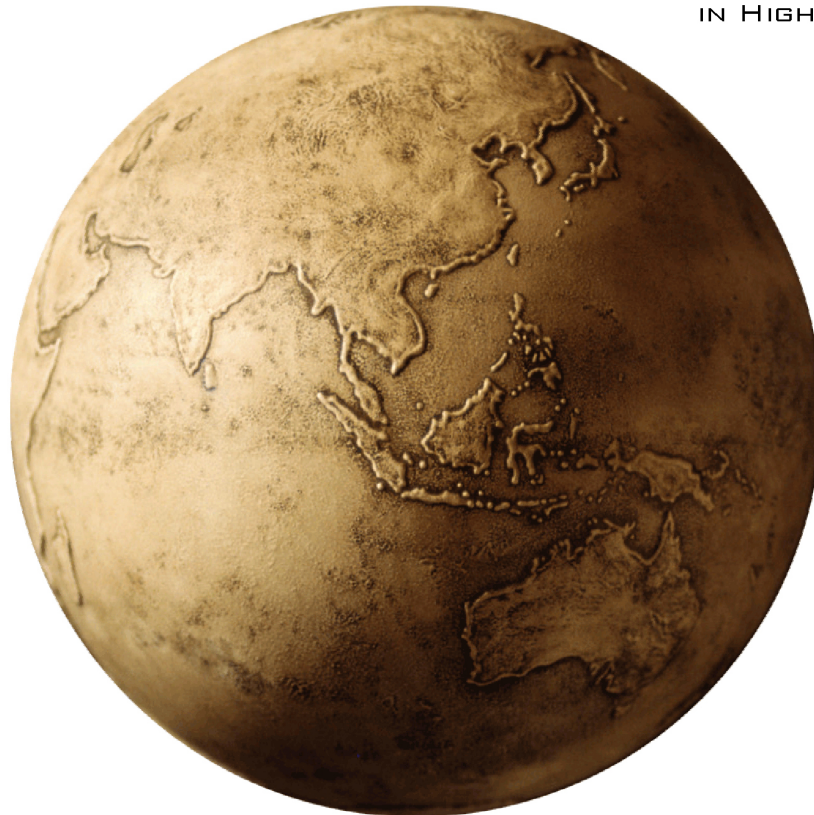International Journal of

Teaching & Learning

in Higher Education

ISETL

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Purpose

The International Journal of Teaching and Learning in Higher Education (ISSN 1812-9129) provides a forum for the dissemination of knowledge focused on the improvement of higher education across all content areas and delivery domains. The audience of the IJTLHE includes higher education faculty, staff, administrators, researchers, and students who are interested in improving post-secondary instruction. The IJTLHE is distributed electronically to maximize its availability to diverse academic populations, both nationally and internationally.

Submissions

The focus of the International Journal of Teaching and Learning in Higher Education is broad and includes all aspects of higher education pedagogy, but it focuses specifically on improving higher education pedagogy across all content areas, educational institutions, and levels of instructional expertise. Manuscripts submitted should be based on a sound theoretical foundation and appeal to a wide higher education audience. Manuscripts of a theoretical, practical, or empirical nature are welcome and manuscripts that address innovative pedagogy are especially encouraged.

All submissions to IJTLHE must be made online through the Online Submission Form. In addition, all manuscripts should be submitted in English and in Microsoft Word format. The following Submission Guidelines pertain to all manuscript types, that is, Research Articles, Instructional Articles, and Review Articles. Ultimately, authors should follow the guidelines set forth in the most recent edition of the Publication Manual of the American Psychological Association (APA).

Review Process

Following a brief editorial review, each manuscript will be blind reviewed by two members of the Review Board. The review process will take approximately 90 days. At the end of the 90-day review process authors will be notified as to the status of their manuscripts - accept, revise and resubmit, or reject - and will receive substantive feedback from the reviewers. Manuscript authors are responsible for obtaining copyright permissions for any copyrighted materials included within manuscripts.

Research Articles

Instructional Articles

Transdisciplinary or Pedagogically Distinct?
Disciplinary Considerations for Teaching Certificates in Higher Education

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This research provides an analysis of disciplines and disciplinary differences regarding the pedagogical value and content of post-graduate teaching certificates in higher education. Findings and recommendations are based upon a survey (N = 450) of department heads and doctoral students at Canadian research-focused universities. Participants were surveyed regarding their perceptions of the value of a credentialed teaching certificate for new academics seeking employment, as well as whether they believe the pedagogical knowledge and skills that typically comprise teaching certificates are valuable. Examining whether a strongly held disciplinary identity in more senior academics contributes to these differences, the survey results demonstrate significant differences between disciplines for the overall value and, in some areas, the content of teaching certificates, especially in department head responses. Relatedly, the open-ended survey comments show a deeply ingrained disciplinary identity, particularly for those holding the department head roles, which in turn reflected several participants' perceptions of disciplinary teaching and learning knowledge and skills as holding superior value to generic, transdisciplinary programs. Recommendations include a renewed focus in educational development initiatives on linking transdisciplinary approaches to specific disciplinary contexts, further connecting overarching pedagogical theories to pedagogical content knowledge as it is translated in practice.

With a few notable exceptions, centralized centers for teaching and learning within institutions of higher education provide teaching development activities in a transdisciplinary format, often using generic teaching development approaches. The term *transdisciplinary* signifies an approach pertaining to multiple fields and branches of knowledge, and in higher education it can be associated with centralized, coordinated pedagogical programming using an overarching or generic understanding of teaching and learning. Transdisciplinary approaches have been criticized as processes "in which educational developers parachute into disciplines with their generic canon about student learning, emphasizing the deep and surface binary, and about reflective practice" (Manathunga, 2006, p. 24). Generic approaches have also been identified as problematic because academics have perceived differences in their focus on teaching and learning across the disciplines (Gurung, Chick, & Haynie, 2009). Nevertheless, the justification for transdisciplinary approaches is warranted on the basis that they provide institutional economies of scale (Jenkins & Burkill, 2004; Kanuka, Heller, & Jugdev, 2008). Research has shown that academics can identify over 140 distinct disciplines (National Forum, 2015). Rowland (2002) asserts further that as disciplines are increasingly fragmented into "highly specialized sub-disciplines, so the very idea of the discipline itself becomes redundant" (p. 61; see also Brew, 2003). Alternatively, it has been argued that there are opportunities for metadisciplinary awareness through teaching programs when they are offered in a transdisciplinary format, which can be achieved through collegial conversations and collaborations across disciplines (Chick, Haynie, & Gurung, 2009). Finding a balance between discipline-specific versus transdisciplinary teaching knowledge and skills has been hotly debated in the literature, leaving those who offer teaching development with few clear ways forward. This conundrum is further complicated by the fact that providing comprehensive but individualized teaching services and programs for more than 140 unique disciplinary areas would be unfeasible for most, if not all, institutions of higher education.

While acknowledging the impracticality of providing pedagogically unique teaching programs exponentially, it is also widely recognized that academics have a strong preference for engaging in teaching development activities in their own discipline. This preference arises from academics' tendency to relate to their own pedagogical content knowledge alongside a distinct disciplinary culture and discourse, often learned early in a career through associations in home departments or units, professional associations, and scholarly fora (National Forum, 2015; Wareing, 2009). Healy (2005) argues further that, given the perceived importance of a discipline within academics' identity, it is reasonable to assume the nature of the teaching varies between disciplines. Even though it is acknowledged in the literature that faculty members strongly believe they have a distinct disciplinary identity and reflect a clear sense of disciplinary attributes and boundaries, the existence of such disciplinary boundaries has also been challenged in the literature. Barnett (1994), for example, argues that "disciplines are not the harmonious enterprises sometimes assumed but are, rather, the territories of warring factions, often leaving a bloody mess in their internecine struggles" (p. 61). Relatedly, Gibbs (2000) notes that various teaching activities described as being discipline-specific are, in fact, applied widely across disciplines – while also acknowledging that transdisciplinary (or, generic) principles

of teaching and learning apply with varying significance in different disciplines. These varying pedagogical differences are often witnessed within each discipline's signature pedagogies (Gurung et al., 2009; Shulman, 2005), which form a relationship between pedagogical content knowledge (PCK) and disciplinary ways of thinking in practice.

Given the strong disciplinary identities that exist, as well as the enduring perceptions amongst academics that there are important differences between disciplines, this study aims to gain further insights into disciplinary considerations within the umbrella of transdisciplinary teaching programs. In this study, we explore these disciplinary differences regarding the perceived value of a transdisciplinary credentialed teaching program for new academics, such as those typically offered through an institution's centralized certificate in teaching. Specific research objectives include (a) gaining insights into the perceived value of transdisciplinary teaching certificates for new academics and (b) perceptions of transdisciplinary pedagogical knowledge and skills within different disciplines.

Literature Review

Issues related to disciplinary considerations for centrally supported institutional activities, including teaching development programs and initiatives, have tended to trigger binary positions in the literature. Research and discourse on this topic vary widely. There are views, for example, that teaching development is "best not seen as a generic and practical activity … If it does, it will inevitably be sucked into the reductive discourse of culture compliance" (Rowland, 2002, p. 62). Alternatively, Jenkins and Burkill (2004) assert that most teaching issues that new and early academics encounter are generic in nature, though they do acknowledge that a disciplinary focus can help to head off common criticisms. Other discourse in the literature expresses similar sentiments, emphasizing that disciplinary relevance may address academic preferences to engage in teaching development within their own disciplinary context. For example, a recent study by the National Forum (2015) confirms perceptions of specific pedagogical approaches as being uniquely connected to the disciplines, but also highlights the importance of transdisciplinary skill development, such as critical reasoning and independent thinking, concluding that "teaching approaches cited by disciplinary groups as central to their pedagogy are not exclusive to any discipline – in other words, people may prefer to talk with disciplinary colleagues about teaching, even though colleagues in other disciplines have similar issues" (p. 16). Wareing states that disciplinary division "offers a partial explanation for challenges made to the validity of cross-university activities, such as postgraduate certificates in learning and teaching," explaining that

academics working on "transdisciplinary activities encounter unfamiliar social networks and customs, and need to develop new skills and bodies of knowledge before feeling confident and comfortable outside their original discipline" (2009, pp. 917-918). Such views demonstrate the need to gain further understanding of disciplinary perspectives and contexts that could be integrated into generic educational development initiatives, such as teaching certificates.

An analysis of current literature on transdisciplinary approaches to teaching programs suggests that while there is strong evidence of academics' preference for distinct disciplinary approaches within teaching programs, the pedagogical evidence supporting such disciplinary divides in teaching is rather thin. For example, it has been suggested that there is little evidence in the literature on disciplinary differences with respect to how students learn in specific disciplines, including the research on curriculum and learning theories (Gibbs, 2000; Manathunga, 2006). Wareing (2009) also provides an overview of the literature, suggesting there is little evidence to support disciplinary differences. Rather, academics perceive their discipline to be "methodologically, pedagogically and conceptually better than other disciplines … [and] academics construct 'stories' to explain the superiority of their own disciplines over others" (pp. 921-922). These stories, according to Wareing, construct and maintain disciplinary distinctiveness and superiority, ultimately resulting in lower perceived relevance for transdisciplinary teaching programs.

Much of the literature reviewed argues that academics *perceive* there to be differences in the way teachers teach and learners learn based on the discipline. For example, Yeo and Boman's (2017) recent work calls attention to disciplinary differences in faculty conceptions of assessment, stating that "a universal approach to assessment practice is not realistic…significant variance between disciplinary approaches should be expected" (p. 3). However, much of the literature reviewed also argues that because there is scant evidence of actual (versus perceived) disciplinary differences, there is, in fact, justification for transdisciplinary teaching programs. While far less research on this topic has been conducted with students, some literature illustrates that students hold similar disciplinary perspectives. Goldschmidt (2014), for example, reveals that students appear to have similar perspectives with respect to their identity and the value of disciplinary practices. Research by Prior (1998) also substantiates this perspective, with findings that show working with students in their own disciplines creates a sense of belongingness or membership, highlighting the importance of such disciplinary identities. This disciplinary identity has also been confirmed in other recent higher education research (see, for example,

Figure 1
Pedagogical content knowledge and signature pedagogies.
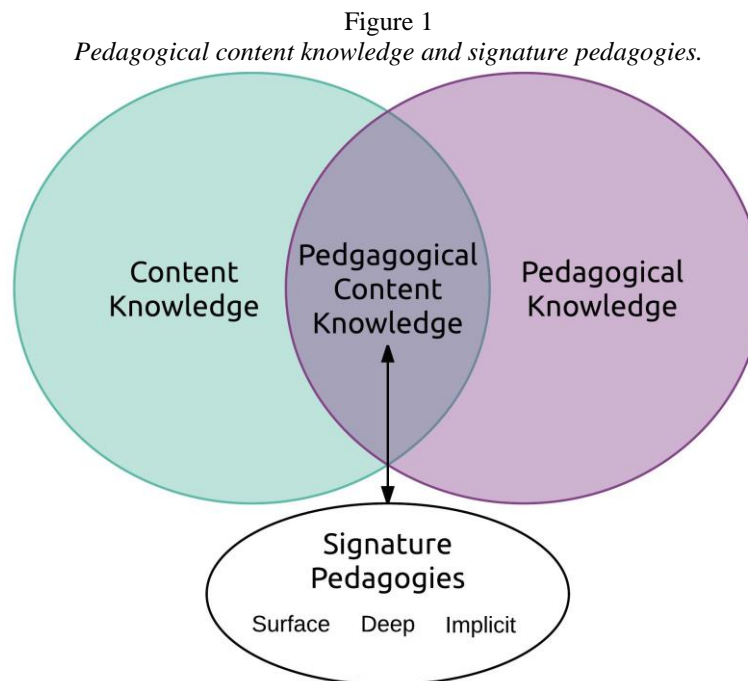
Note. This figure illustrates the intersection of disciplinary content and pedagogical knowledge, relating to the elements of signature pedagogies, as outlined in Shulman (1986; 2005).

Smith, 2016) on undergraduate meaning making processes in disciplinary contexts.

Our review of the research is consistent with Lueddeke (2003) in that much of the literature in this area is normative and descriptive, with fewer studies than might be expected on academics' values and beliefs with respect to teaching practices within disciplinary contexts. While an extensive review is beyond the scope of this study, Donald's (2002) 25 years of research provides noteworthy evidence that not only shows disciplinary differences in the ways students and academics think, but also illustrates that certain teaching and learning practices can hinder or help student learning within the disciplines. It is also worth noting that absent in much of the literature advocating for a transdisciplinary approach to teaching programs is important seminal research over several decades conducted by scholars including Biglan (1973), Kolb (1981), Becher (1989), Healey (2000), and Donald (2002).

Conceptual Framework

Transdisciplinary teaching programs that reflect an underpinning assumption that teaching and learning activities are, carte blanche, generic are at odds with research showing embedded disciplinary dictums about the nature of learning, which can ultimately guide pedagogical approaches. Shulman (1986) has referred to the intersection of disciplinary content and pedagogy knowledge as pedagogical content knowledge. The dichotomy between transdisciplinary and disciplinary knowledge of pedagogy has been questioned due, largely, to the work of Shulman (see also Grossman, 1989; Gudmundsdottir, 1988; Wilson, Shulman, & Richert, 1987). Recognizing the importance of both pedagogical knowledge and disciplinary (content) knowledge, Shulman developed a framework for teacher development by introducing the notion of pedagogical content knowledge, illustrated in Figure 1.

Extending this work on content knowledge and disciplinary context for teaching and learning, Shulman (2005) articulated the idea of signature pedagogies in the professions (or, disciplines), which involve three dimensions: a surface structure, reflecting concrete or operational components of any particular field; a deep structure that reflects a set of assumptions about the best way to impart a particular body of knowledge and skills; and, an implicit structure involving the beliefs, values, and dispositions of the profession or discipline (pp. 54-55). Together, pedagogical content knowledge and signature pedagogies provide a foundation for investigating implicit and explicit perceptions of transdisciplinary and discipline-specific considerations for educational development via programs such as teaching certificates.

Shulman (1986) has argued that a distinct form of pedagogical content knowledge (PCK) exists and that

this knowledge builds upon, but is different from, subject matter knowledge. Shulman defines PCK as going "beyond knowledge of subject matter per se to the dimension of subject matter knowledge *for teaching*" (emphasis in original, p. 6). In this way, rather than viewing teaching development from the perspective of pedagogical knowledge versus content knowledge, Shulman argues for the integration of these two knowledge bases. Warning that the contemporary trend to solely prioritize pedagogy over content has created a missing paradigm, Shulman's (1986) foundational work continues to ring true today in highlighting a "sharp distinction between knowledge and pedagogy…[t]he missing paradigm refers to a blind spot with respect to content" (p. 5) within teaching research and practice as a gap that must be addressed.

Shulman's conceptualization of PCK has relevant and direct implications for teaching programs in higher education. According to Shulman (1986), those who are involved in the design, development, and facilitation of teaching and learning activities need to acquire knowledge about content, as well as overall program development. Hence, to facilitate effective classroom teaching, academics need to understand not only the pedagogical strategies unique to their disciplines (e.g., the subject matter being taught and the culture of their discipline), but also learning theories, which are transdisciplinary and relevant to understanding students' intellectual development. For example, the seminal research by Perry (1970) and more recent research by Baxter Magolda (2004) on students' intellectual development are applicable across and within the disciplines. This kind of understanding provides a foundation for PCK that enables academics to make ideas more accessible to the students they teach.

If teaching in higher education is to be effective, academics must struggle with issues of both their disciplinary ways of knowing and overarching bodies of pedagogical knowledge. This means that academics need to develop a repertoire of teaching methods that reflect the uniqueness of their disciplinary culture, as well as the broader constructs of the cognitive sciences and educational research on students' intellectual development. This presents an intersection between learning how to facilitate the students' intellectual development and understanding the unique ways of constructing knowledge within and between the disciplines. It is here that PCK connects to signature pedagogies that implicitly and/or explicitly build disciplinary habits of mind by "educating students to practice the intellectual moves and values of experts in the field" (Chick et al., 2009, p. 2), therefore creating discipline-specific strengths while also building metadisciplinary awareness by fostering linkages and connections within and between the disciplines.

Related prior research has also revealed some important insights on the intersection of disciplinary

content and transdisciplinary pedagogical knowledge. An overview of this literature reveals both support and change in instructors as a result of developing pedagogical content knowledge. Noteworthy in the empirical research reviewed by Van Driel, Verloop, and De Vos (1998) is that there might be value to having disciplinary experts study subject matter from a transdisciplinary pedagogical perspective. As such, the constructs put forward by Shulman (1986) and the related research on PCK and signature pedagogies were used to frame the research in this study.

Research Design and Methodology

The purpose of this research was to gain further insights on (a) the perceived value of transdisciplinary teaching certificates and (b) participants' perspectives on transdisciplinary pedagogical knowledge as compared to discipline-specific content knowledge. The study utilized a survey methodology via a cross-sectional design (Cohen, Manion, & Morrison, 2011) for collecting and analyzing participants' perceptions and views of teaching development program content within post-graduate teaching certificates. Following an analysis of the literature on teaching development programs within higher education, the survey was designed according to five recurring areas of focus for teaching development of academics across disciplines: 1) varied teaching methods; 2) diverse assessment strategies; 3) undergraduate class size; 4) philosophies of teaching and theories of learning; and 5) course management and instructional design, such as learning outcomes and syllabi (Arreola, 2007; Hunt, Wright, & Gordon, 2008; Kenny, Watson, & Watton, 2014; Smith, Heubel, & Hansen, 2016). The survey was designed to explore these five areas broadly, with eight specific questions focused on teaching program content, each of which was followed by a textual comment box, therefore capturing participant views through both closed and open-ended data. A specific survey question related to discipline was also included, and two survey questions explored the perceived value of a credentialed teaching certificate for primarily teaching-focused (instructional) versus primarily research-focused (tenure track) academic positions. The survey concluded with an open-ended comment box to capture additional unstructured perspectives.

Sample

This study used a convenience sample of two groups of participants: doctoral students ($N = 128$), who are the target audience for taking post-graduate teaching certificates, and department heads ($N = 322$), who are responsible for leading academic hiring in Canada. Department heads from six of Canada's U15 universities (research-focused with

medical faculties) were identified via information listed on publically available websites. Six hundred participants meeting the inclusion criteria were emailed invitations to participate in the online survey for a response rate of 54% ($N = 322$). For doctoral students, to ensure participation was voluntary, institutional research ethics approval required that survey invitations were provided by a member of the Graduate Students' Association (GSA), not a faculty member. Therefore, a GSA member at Canadian research-intensive university distributed the invitation for doctoral participants via an email listserv, resulting in 128 usable doctoral survey responses. To enable current and recently completed doctoral students to participate, those who held or were transitioning to post-doctoral fellow positions were included in the target sample (for clarity, doctoral student is the term used for this group). Disciplinary sub-groups were determined according to the Canadian Tri-Agency framework, which includes the Health Sciences (doctoral students $n = 33$, department heads $n = 63$), Natural Sciences & Engineering (doctoral students $n = 56$, department heads $n = 90$), and Humanities & Social Sciences (doctoral students $n = 20$, department heads $n = 133$). In a few instances, responses related to these disciplinary categories were not provided and therefore could not be quantitatively analyzed; however, since all of the survey questions described below contained both a quantitative and descriptive field (open-ended comment boxes), adjustments were made by analyzing all open-ended comments.

Data Analysis

To analyze and compare responses of department head and doctoral student groups according to discipline, data analysis centered on demonstrable relationships, differences, patterns, or themes between groups regarding both the value and content of teaching development within post-graduate teaching certificates in higher education. For the open-ended text-based survey items, responses were analyzed using generic qualitative coding techniques (Merriam, 2009) inclusive of descriptive, process, in vivo, pattern, and simultaneous coding, then organized into theoretical units that emerged from the saturated categories and themes. For the quantitative survey items, responses were analyzed using descriptive and inferential statistical procedures via SPSS software. Likert-type scales ranging from 1 (*strongly agree*) to 4 (*strongly disagree*) were used to measure participant perceptions. Because there is a debate in the literature about treatment of Likert-type scales (e.g., Jamieson, 2004), where the outcome variables included Likert-type items that are ordinal in nature, both a parametric (i.e., t-test for comparing doctoral student and department head groups, and a one-way ANOVA for comparing across three disciplinary groups) and corresponding non-parametric test (i.e., Mann-Whitney and Kruskal-Wallis respectively) were conducted, with the most conservative results selected (López, Valenzuela,

Nussbaum, & Tsai, 2015; Polit, 2009). Post-hoc tests were conducted to determine whether the mean difference for items between disciplines was significant, with Tamhane's T2 selected for post-hoc tests because it is robust to homogeneity of variances (i.e., it does not assume equal variances) (Efrosini, Kokaliari, & Roy, 2012, p. 574).

Limitations

Since this research focuses on participants from research-intensive universities, it is limited by the nature of the methods and sample utilized. There is a need for further research on these issues, including additional quantitative, qualitative, and mixed methods studies using other sample types and sizes across different higher education contexts.

Results

Survey findings illustrate several significant differences according to discipline and role (department head or doctoral student), not only for the content comprising post-graduate teaching certificates, but also for the overall perceived value of such certificates (for further information on overall perceived value for academic employment, please see Kanuka & Smith, 2018). As the following results show, the quantitative results demonstrate where significant differences between doctoral student and department head groups occur according to discipline, with the open-ended comments providing insights into why these disciplinary differences exist.

Quantitative Results

To determine whether there were differences between the three disciplinary categories of Health Sciences, Humanities & Social Sciences, and Natural Sciences & Engineering, analysis of doctoral students' and department heads' combined and isolated quantitative responses were completed as follows.

Disciplinary differences for academic hiring. Significant differences between disciplines for combined department head and doctoral student responses can be explained by examining the isolated responses of each of these roles. For department heads, a one-way ANOVA showed significant differences ($p < 0.001$) between disciplines (see Q1 in Table 1), with Health Sciences department heads placing significantly higher value on a post-graduate teaching certificate as positively influencing interview selection for tenure or tenure-track positions. Tamhane post-hoc tests confirmed significant differences occurred between department heads, with those in Health Sciences placing significantly higher value on Q1 than those in Humanities & Social Sciences ($p < 0.001$) and in Natural Sciences &

Table 1
Perceived Value of Teaching Certificates for Academic Hiring by Discipline

	Discipline n (%)[†], Mean (SD, total n)		

Q1. If an applicant for a _tenure or tenure track_ faculty position in your department has a 'for credit' (formal, externally recognized) Certificate in Teaching and Learning in Higher Education from a respected university, it would positively influence selection for an interview.

	Health Sciences	Natural Sciences & Engineering	Humanities & Social Sciences
Dept. heads	52 (83.9%), 1.81** (0.74, 62)	66 (74.1%), 2.21** (0.73, 89)	84 (64.2%), 2.35** (0.76, 131)
Doctoral students	28 (87.5%) 1.72 (0.85, 32)	43 (79.6%) 1.85[††] (0.74, 54)	17 (85.0%) 1.85[††] (0.67, 20)
Dept. heads and doctoral students combined	80 (85.1%) 1.78*** (0.78, 94)	109 (76.2%) 2.07*** (0.75, 143)	101 (66.9%) 2.29*** (0.77, 151)

Q2. If an applicant for an _instructional position_ (e.g., non-tenure/non-tenure track lecturer, sessional) in your department has a 'for credit' (formal, externally recognized) Certificate in Teaching and Learning in Higher Education from a respected university, it would positively influence selection for an interview.

	Health Sciences	Natural Sciences & Engineering	Humanities & Social Sciences
Dept. heads	54 (87.1%), 1.57* (0.72, 62)	77 (88.5%), 1.71 (0.73, 87)	111 (85.4%), 1.89* (0.74, 130)
Doctoral students	28 (90.3%) 1.48 (0.68, 31)	48 (90.5%) 1.55 (0.67, 53)	19 (95.0%) 1.60 (0.60, 20)
Dept. heads and doctoral students combined	82 (88.2%) 1.54[†††] (0.70, 93)	125 (89.2%) 1.65 (0.71, 140)	130 (86.7%) 1.85[†††] (0.72, 150)

[†] Number and percentage of (2) agree and (1) strongly agree survey responses by discipline.
*$p < 0.05$ and **$p < 0.001$, one-way ANOVA shows significant differences in department head responses between disciplinary categories.
[††]$p < 0.01$, t-test shows significant differences between doctoral students and dept. heads in Natural Sciences & Engineering and Humanities & Social Sciences.
***$p < 0.001$, one-way ANOVA shows significant differences, with Tamhane confirming significant differences between all three disciplines for combined responses.
[†††]$p = 0.003$, one-way ANOVA shows significant differences, with Tamhane confirming significant differences between Health Sciences and Humanities & Social Sciences disciplines for combined responses.

Engineering ($p = 0.003$) disciplinary groups. Regarding interview selection for non-tenure track instructional positions (see Q2 in Table 1), the one-way ANOVA and Tamhane post-hoc tests both showed significant differences ($p < 0.05$), with department heads in the Health Sciences placing significantly higher agreement on post-graduate certificates than department heads in the Humanities & Social Sciences. For doctoral students, responses for Q1 and Q2 showed no significant differences between disciplines.

To further analyze whether differences exist between doctoral students and department heads in each disciplinary category, a t-test was used to compare means between these two groups. Regarding hiring for a tenure or tenure-track position (see Q1 in Table 1), a t-test comparing roles demonstrated that, as compared to department heads in those disciplines, doctoral students in the Natural Sciences & Engineering ($t(141) = 2.86$, $p = 0.005$) and Humanities & Social Sciences ($t(149) = 2.77$, $p = 0.006$) disciplines placed significantly higher value on a post-graduate teaching certificate as positively influencing interview selection. However, regarding non-tenure track instructional hiring (see Q2 in Table 1), a t-test demonstrated no significant differences between doctoral students and department heads according to discipline for the

perceived value of a teaching certificate as positively influencing interview selection.

Disciplinary consistency for teaching development. Analysis showed few significant disciplinary differences for department head and doctoral student responses regarding the value of developing teaching knowledge and skills via a post-graduate certificate. To analyze department head perceptions of the value of content that comprises teaching certificates (for more information, see Table 1A in Appendix A), a one-way ANOVA demonstrated significant differences for department heads between disciplines ($p \leq 0.005$) for teaching development of learning outcomes. Tamhane post-hoc tests further illustrated that department heads in the Health Sciences placed significantly higher value on teaching development for writing learning outcomes than those in Natural Sciences & Engineering ($p = 0.025$) and Humanities & Social Sciences ($p = 0.004$) groups. Regarding teaching development focused on knowing how students learn based on learning theories in higher education, a one-way ANOVA demonstrated significant differences for department heads between disciplines ($p < 0.05$), with Tamhane post-hoc tests showing that those in the Health Sciences again placed higher value on this than those in the Natural Sciences & Engineering ($p = 0.025$) disciplinary group. For doctoral student responses, a one-way ANOVA showed significant differences ($p < 0.05$) between disciplinary groups for only one item: knowing how to develop a syllabus/course outline (for more information, see Table 2A in Appendix A). A one-way ANOVA showed significant differences ($p < 0.05$) between disciplinary groups, with the more conservative Kruskal-Wallis test confirming significant differences between mean ranks ($p = 0.040$). Here, Tamhane post-hoc tests demonstrated slightly significant differences ($p = 0.057$) between two disciplines, illustrating that doctoral students in the Health Sciences placed somewhat higher value on teaching development for syllabi/course outlines as compared to those in the Natural Sciences & Engineering.

Overall, those in the Health Sciences perceived teaching certificates to be of greater value for academic hiring, with doctoral students and department heads alike in the Health Sciences providing significantly higher mean values for Q1 and Q2, ultimately illustrating agreement that teaching certificates would positively influence interview selection, particularly for non-tenure track instructional positions. In contrast to doctoral student responses, department heads in the Natural Sciences & Engineering and the Humanities & Social Sciences provided the lowest mean values for these questions, indicating lower agreement with teaching certificates as positively influencing interview selection, especially for tenure-track positions.

However, unlike the diverging responses apparent for academic hiring, responses regarding development of teaching knowledge and skills (see Tables 1A and 2A) via a post-graduate certificate were more consistent, with very few significant differences in doctoral student and department head survey responses according to discipline. In the few areas where differences did exist, results reflected similarities to the academic hiring findings, with those disciplines outside of the Health Sciences providing lower mean values.

Open-Ended Survey Results

Analysis of the open-ended responses focused on core themes and patterns emerging from the textual comment items. Specifically, analysis centered on participant descriptions of the value and content typically comprising teaching certificates, as related to the questions posed, as well as overall participant explanations reflecting disciplinary context and considerations.

The importance of discipline. Participant comments lend further insights by describing the reasons why there are significant disciplinary differences regarding the overall value of a teaching certificate, especially for department heads and, in particular, for academic hiring. As compared to the doctoral students, department heads provided a larger range of open-ended comments, with several of their descriptions revealing deeply ingrained disciplinary perspectives and values. For instance, one department head noted that the "credibility of the instructor is also important to the value of such a certificate. As is knowledge of how to teach in specific disciplines." In regard to Engineering courses, one department head also described the importance of disciplinary knowledge:

> It is most important that the candidate, especially a sessional, have knowledge of the subject at hand. The weakness in the universities is that Faculty do not know how the real world operates….It is not the lack of ability to design a course - it is the lack of understanding what the subject matter is.

Echoing this comment, a Humanities and Social Sciences department head noted that disciplinary expertise takes priority: "for us there exist credentials already on the teaching of particular languages. These credentials would have more relevance than a Cert in Teaching and Learning." Even though Health Sciences department heads provided higher overall quantitative values in several areas, similar disciplinary qualifications were still identified as important within the open-ended results, with one participant stating that "A Masters in Education is a good option as well, but I don't find it is well regarded in nursing education." Placing priority on experience with and knowledge of disciplinary ways of knowing and being was a recurring theme in

department head comments, in several cases setting up a binary between disciplinary versus transdisciplinary teaching abilities and qualifications.

The theme of prioritizing disciplinary experience and expertise continued in department head descriptions of the importance of research in developing disciplinary skills and knowledge within universities. As one department head stated, "What we teach is grounded in our research. If teaching training and pedagogical theory helps, fine, but that is second to experience and actual content." Another department head also emphasized the importance of both disciplinary competence and research contributions:

> I strongly agree that all those [teaching] competences are important, but they do not override a candidate's competence in his/her own discipline and his/her ability to conduct original research and publish it in scholarly venues. This is the reason I did not "strongly" agree in the first two questions.

In all of these examples, what comes to the fore is the persisting priority of disciplinary and research expertise, as well as experience with disciplinary knowledge systems and methods, even if transdisciplinary teaching knowledge and skills are also viewed as somewhat valuable.

Disciplinary perspectives on teaching development. Qualitative results also shed insights into why there are significant disciplinary differences for department head responses regarding certain topics that typically inform the knowledge and skills developed in teaching certificates. With respect to developing abilities to write a syllabus, one doctoral student emphasized institutional context and subject area, as follows: "Support for this kind of training and teaching certification really depends in part on where you earned your PhD and gained post-doctoral training in the first place (+/- subject area)." Likewise, a department head also emphasized disciplinary context and content, noting that "it doesn't take long to learn how to develop a syllabus. I[t]'s the discipline that takes the time to learn, the content: the form is easily acquired." This perspective was also reinforced in other department heads' comments about learning outcomes, with one participant noting that "[a]fter all, a big part of identifying learning objectives has to do with content, not just 'form.'" Such perspectives were echoed by another department head, who said that "Learning outcomes may be defined in a variety of ways and may be discipline specific, so learning about these in the type of course/certificate implie[d] by this survey, may not have a major impact for some disciplines." These participant descriptions continue to illustrate the ways in which several participants, particularly department heads, placed high value on discipline-specific knowledge and skills.

Another area where the open-ended comments help to explain the reasons why significant disciplinary differences occur for department heads is in regard to

developing an understanding of how students learn based on learning theories. One department head described his or her discipline as a "specialist field with its own literature on best practices, rather different from more general theory on learning in [post-secondary education] PSE settings." Another agreed:

> Whilst this is valuable, I have found it critical that the teaching imparts knowledge at the cutting edge of the discipline, preferably by a Faculty member who is an international expert in the discipline being taught. There is nothing that substitutes for this in engaging the attention and motivation of the students in class.

The importance of discipline was reiterated by several department heads, as illustrated in comments such as "the discipline matters more to us" and "Again this may be quite discipline specific, and so learning theories may not equally apply to all students in all disciplines." In this way, discipline-specific knowledge and skills were often given priority over the development of teaching knowledge and skills.

Emphasis on disciplinary ways of knowing and being, as well as discipline-specific teaching approaches, continued in the department head comments with respect to developing diverse instructional and assessment methods, in some cases contrasting doctoral student responses. For example, one doctoral student "absolutely" agreed with development of diverse teaching methods, noting that "Although some methods work better than others in specific fields, the goal of all university-level teaching should be to engage students in the learning process." In contrast, several department heads agreed but provided disciplinary caveats:

> Agree, provided the facilitator is an expert in the discipline taught. Problem based learning by "non experts" is, in my opinion, futile and an unproven theory. It is also not supported by recent student feedback in disciplines such as medicine, where students are looking to be taught by practicing physicians and reject non-physicians.

Several other department heads emphasized the importance of disciplinary teaching and learning knowledge and skills, demonstrated in comments such as, "Again, this is very diverse and specific to the course material/topics to be taught," and, "Some of these methods may be irrelevant to certain disciplines." Crystalizing many of these recurring sentiments, one department head put it this way: "One of the great weaknesses of current workshop and training methods is that these do not translate into various disciplinary contexts or into discussions of curriculum." Providing

several insights into the reasons why several participants, particularly department heads, demonstrated differing views on both the value and content of teaching certificates, the open-ended results illustrate deeply held values of and emphasis upon discipline-specific teaching and learning knowledge and skills.

Results Summary

Results from the survey data demonstrate differences between participant responses according to discipline and according to their roles as either a department head or doctoral student. Quantitative survey data showed significant differences between these groups for academic hiring, with department heads in the Natural Sciences & Engineering and Humanities & Social Sciences groups indicating lower agreement with teaching certificates as positively influencing interview selection, especially for tenure-track hiring. In terms of teaching certificate content that informs what knowledge and skills are developed, while few differences appeared, there were notable differences between disciplines regarding participants' perceptions of the value of knowing how to write learning outcomes and how students learn based on learning theories (department heads), as well as for knowing how to create a syllabus/course outline (doctoral students). Here again, differences occurred between disciplines outside of the Health Sciences, as these disciplines provided lower mean values. The open-ended comment results further illuminate the reasons why participants, specifically department heads, showed these differences. Open-ended comments illustrated thematic perceptions (largely of department heads) that reflect deeply held disciplinary values related to teaching and learning knowledge and skills, ultimately reinforcing the primacy of disciplinary ways of knowing and being over the transdisciplinary pedagogical focus of teaching certificates.

Discussion and Recommendations

Given teaching development programs are typically offered in a transdisciplinary format in institutions of higher education, many, if not most, disciplinary narratives, cultures, and pedagogies are only tangentially situated in the program content. Much of the literature on transdisciplinary teaching programs provides a compelling rationale for this practice, specifically, creating economies of scale with programs that address many needs across disciplines in higher education. Perhaps as importantly, research on the intellectual development of students who enter programs in higher education is relevant across disciplines. For example, Baxter Magolda and Terenzini's (1999) analysis of trends and implications for learning in the twenty-first century revealed that critical and reflective thinking, complex cognitive thinking, application of knowledge to practical problems, and self-directed/self-regulated learning are essential skills for all undergraduates. All such metacognitive knowledge and skills are necessarily transdisciplinary. These kinds of metacognitive knowledge and skills, also referred to as higher-ordered learning that necessitates meaning construction (Donald, 2002), are premised on learning theories that span the disciplines. These approaches are empirically and theoretically informed, though as the results in this study show, theories tend not to be considered as important as other content typically provided in teaching programs, as department heads' responses across disciplines (especially in Natural Sciences & Engineering, as shown in Table 1A) demonstrated. On this front, the findings indicate that teaching development programs likely need to provide greater focus on, and explanation of, *why* knowledge of learning theories and teaching philosophies are important, explaining specifically how these theories apply to practice. For example, learning theories help us to deeply understand, articulate, and perhaps shift our teaching and learning paradigms (Barr & Tagg, 1995). Such findings illustrate a continued need for connecting theoretical and empirical foundations to our contemporary disciplinary contexts, not only within the scholarship of teaching and learning (Kanuka, 2011), but also within teaching and learning practices.

Recognizing the importance of both PCK and transdisciplinary knowledge, a key focus for teaching development programs would be to work closely and collaboratively with all faculties in a manner that recognizes the distinctive form of teacher-practitioners' PCK. In doing so, disciplinary ways of knowing can be used by faculty to guide their actions in highly contextualized classroom settings. At the same time, it is important for those in faculty development roles to remain cognizant that many, if not most, issues facing new academics occur across the disciplines. Wareing (2009) presents compelling literature illustrating that there exists as many differences *within* disciplines as there are *across* disciplines, with discourses that not only reinforce boundaries between disciplines, but also "mythologize the superiority of one's own discipline over others" (p. 926). Supporting this assertion, the findings in this study indicate that pedagogic issues included in cross-university teaching programs that apply across all disciplines can be dismissed by some academics because the constructs and content terminology are inconsistent with the perceived importance of disciplinary ways of knowing.

Prior research has shown that while efforts to connect the disciplines have been initiated, results reveal that these activities have "had limited effectiveness as a sole strategy" (Quinnell, Russell, Thompson, Marshall, & Cowley, 2010, p. 22). Quinnell et al. also assert that

individual academics need to make meaning of the transdisciplinary information, arguing "academic staff are first and foremost disciplinary experts, they are best placed to comment on which models and practice of scholarship describe the scholarship of learning and teaching within the context of their own disciplines" (2010, p. 21). At the same time, internationally, broader initiatives aimed at helping to foster teaching and research discussions between and across disciplines and institutions, such as the Quality Assurance Agency for Higher Education's recent *Focus On: The Post-Graduate Research (PGR) Student Experience* (n.d.) report and resources for the United Kingdom, point to evidence of these continued conversations.

Mindful of the benefits of transdisciplinary approaches, the results from this study indicate that academics may fail to translate transdisciplinary knowledge and skills to their own disciplinary contexts and everyday classroom practices. Indeed, rather than make meaningful connections with transdisciplinary theories and constructs of teaching and learning, more established academics (such as department heads) may dismiss this information as irrelevant. Based on our findings, it is misguided to place the sole responsibility of translating transdisciplinary theory to practice on academics within their own specific disciplines. In order to address this issue with current teaching certificates that, as one department head affirmed, "do not translate to various disciplinary contexts, or into discussions of curriculum," those in centralized centers for teaching and learning and in specific departments have an opportunity to work collaboratively to strike a better balance between transdisciplinary and discipline-specific teaching development.

The data in this study also support Healey's (2000) assertion that there are differing levels of engagement between the disciplines, recommending that links between the scholarly literature on learning and teaching are essential, and concluding that our understanding of how academics view interfacing with transdisciplinary programs on teaching and learning is worthy of further exploration. Quinnell et al. (2010) describes this as "interfacing with SoTL [scholarship of teaching and learning] theory and practice" (p. 24). On this front, findings from this study do support Quinnell et al.'s advocacy for the development of epistemological frameworks establishing ways of knowing for PCK, with results from this study also underscoring the importance of developing further such ontological frameworks, to articulate ways of knowing and being in the disciplines. Specifically, the data from our study of research-focused universities indicates that several academics, particularly those in more established roles, do not view transdisciplinary pedagogical theories as easily translating to their own disciplines; as such, linking transdisciplinary content to

specific disciplines needs to be further built into teaching development programs up front. Data from this study indicate that failure to do so can result in a lack of understanding for how pedagogical theories apply to practice. In particular, despite the fact that much has been written on the relationship between theory and practice in education, the data from this study indicate that several academics across disciplines continue to view educational theories as irrelevant jargon that is disconnected from their everyday teaching practices. These results indicate that more work needs to be done to interface between disciplinarity and transdisciplinarity in teaching development activities.

Conclusion

The purpose of this research was to provide an analysis of disciplines and disciplinary differences in perceptions regarding the value and content of post-graduate teaching certificates in higher education. Findings from this study provide additional insights on disciplinary differences for the perceived value of transdisciplinary teaching development for new academics, as well as differences between disciplines and roles (department heads and doctoral students) regarding the perceived value of various knowledge and skills typically targeted through content within transdisciplinary teaching certificates. Examining whether a strongly held disciplinary identity in more senior academics contributes to these differences, the quantitative survey research results demonstrate significant differences between disciplines for the overall value and, in some areas, the content of teaching certificates, especially in department head responses. Relatedly, the open-ended data show a deeply ingrained disciplinary identity, particularly for those holding department head roles, which in turn reflect several participants' perceptions of disciplinary teaching and learning knowledge and skills as holding superior value to generic, transdisciplinary programs. To address these issues, educational development initiatives must expand the capacity to link transdisciplinary content to specific disciplines, further connecting overarching pedagogical theories to pedagogical content knowledge as it is translated into practice.

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Appendix A
Additional Survey Data

Table 1A
Department Heads' Perceived Value of Teaching Knowledge and Skills

	Discipline n (%)[†], Mean (SD, total n)		
	Health Sciences	Natural Sciences & Engineering	Humanities & Social Sciences
Knowing how to develop a syllabus and/or course outline.	50 (90.9%), 1.55 (0.77, 55)	76 (96.2%) 1.44 (0.57, 79)	107 (98.1%) 1.31 (0.50, 109)
Knowing how to write learning outcomes.	48 (88.9%) 1.52*(0.69, 54)	65 (83.3%) 1.86* (0.75, 78)	86 (80.3%) 1.92* (0.76, 107)
Knowing how students learn (based on learning theories) in higher education.	50 (89.2%) 1.66** (0.67, 56)	62 (79.5%) 1.99** (0.73, 78)	85 (79.4%) 1.94 (0.77, 107)
Knowing how to design a course (e.g., design, develop, deliver, evaluate).	48 (87.2%) 1.60 (0.71, 55)	77 (97.4%) 1.48 (0.55, 79)	104 (96.3%) 1.43 (0.63, 108)
Knowing how to write a teaching philosophy for a dossier/portfolio.	44 (80.0%) 1.86[††] (0.78, 55)	56 (71.8%) 2.17[††] (0.73, 78)	81 (75.7%) 2.06 (0.71, 107)
Knowing how to successfully facilitate large classes.	44 (80.0%) 1.78 (0.81, 55)	70 (91.0%) 1.65 (0.64, 77)	99 (91.7%) 1.69 (0.65, 108)
Knowing how to use diverse teaching methods.	51 (92.7%) 1.53 (0.63, 55)	69 (76.4%) 1.77 (0.66, 79)	98 (90.7%) 1.71 (0.68, 108)
Knowing how to use diverse assessment/evaluation methods.	47 (87.0%) 1.54 (0.77, 54)	76 (96.2%) 1.72 (0.53, 79)	(91.7%) 1.68 (0.68, 108)

[†]Number and percentage of (2) agree and (1) strongly agree survey responses by discipline.
*significant at $p \leq 0.005$ and **significant at $p < 0.05$.
[††]Differences between Health Sciences and Natural Sciences & Engineering were shown to be slightly significant ($p = 0.055$ for one-way ANOVA, and $p = 0.051$ for Kruskal-Wallis), though not shown to be significant in Tamhane post-hoc tests ($p = 0.063$).

Table 2A

Doctoral Students' Perceived Value of Teaching Knowledge and Skills

	Discipline n (%)[†], Mean (SD, total n)		
	Health Sciences	Natural Sciences & Engineering	Humanities & Social Sciences
Knowing how to develop a syllabus and/or course outline.	29 (100.0%), 1.24* (0.44, 29)	42 (98.3%), 1.53* (0.62, 47)	17 (100.0%) 1.24 (0.44, 17)
Knowing how to write learning outcomes.	27 (93.1%) 1.45 (0.63, 29)	45 (95.7%) 1.75 (0.61, 47)	16 (94.1%) 1.53, (0.62, 17)
Knowing how students learn (based on learning theories) in higher education.	28 (96.6%) 1.69 (0.54, 29)	43 (93.5%) 1.76 (0.64, 46)	15 (88.2%) 1.77 (0.66, 17)
Knowing how to design a course (e.g., design, develop, deliver, evaluate).	26 (100.0%) 1.21 (0.41, 29)	45 (97.8%) 1.35 (0.53, 46)	17 (100.0%) 1.24 (0.44, 17)
Knowing how to write a teaching philosophy for a dossier/portfolio.	26 (89.7%) 1.83 (0.81, 29)	41 (87.2%) 1.85 (0.69, 47)	16 (94.1%) 1.77 (0.75, 17)
Knowing how to successfully facilitate large classes.	27 (93.1%) 1.52 (0.63, 29)	45 (95.8%) 1.68 (0.56, 47)	16 (94.2%) 1.65 (0.79, 17)
Knowing how to use diverse teaching methods.	29 (100.0%) 1.38 (0.49, 29)	45 (95.7%) 1.49 (0.59, 47)	16 (94.1%) 1.35 (0.79, 17)
Knowing how to use diverse assessment/evaluation methods.	29 (100.0%) 1.48 (0.51, 29)	43 (91.1%) 1.70 (0.69, 47)	15 (88.2%) 1.65 (0.86, 17)

[†]Number and percentage of (2) agree and (1) strongly agree survey responses by discipline.
*significant at $p < 0.05$.

Interdisciplinary Professional Learning Communities: Support for Faculty Teaching Blended Learning

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In higher education, despite disciplinary expertise and teaching experience, faculty who are asked to implement curriculum into new modalities, particularly ones that rely heavily on technolo-gy such as blended learning, may be intimidated and overwhelmed. However, instructors may be more willing to explore new modalities if they feel that support is available. Professional Learning Communities, or PLCs, support instructors embarking on teaching in new modalities and and us-ing new technology to support and expand their instruction. The current study looks at how a PLC was utilized to support faculty who piloted a blended learning model of course instruction. Seven faculty members from different disciplines shared their perceptions of how PLC meetings affected their ability to teach in the blended learning modality. Various sources of qualitative data, including surveys, interviews, and meetings notes, were analyzed to see the ways in which the faculty mem-bers viewed and utilized the PLC. Faculty reported that the PLC provided support, new ideas, and enhanced teaching and learning outcomes. The interdisciplinary nature of this collaborative group was particularly helpful in allowing instructors to expand their pedagogical practices within this new modality. They also felt more comfortable in their own ability to teach in this modality after receiving feedback from their peers who were also teaching blended learning sections for the first time. This preliminary study provides support that PLCs can assist in shaping faculty skills and boost interdisciplinary collaboration when faculty adapt their teaching to a new pedagogical modali-ty, such as blended.

A greater focus on student learning outcomes and innovative approaches to teaching have been a driving force in higher education. Blended learning is one resulting instructional culmination of this shift. While the literature does not present a single, agreed upon definition of blended learning, Garrison and Vaughn (2008) nicely summarize it as the "thoughtful fusion of face-to-face and online learning experiences" (p. 5). Institutions choosing to implement this type of experience will face the challenge of determining their own definition of blended learning, and they will need to give equal attention to why blended learning is being implemented, as this purpose will drive the mixed-modality initiative (Niemiec & Otte, 2009).

The creation of this alternative learning experience does not simply mean modifying lesson plans and placing content online. Technology is a necessary tool in this learning model, but consideration regarding how it will contribute to the delivery and understanding of the topic being presented should be considered. According to Schaber, Wilcox, Whiteside, Marsh and Brooks (2010), an ideal blended experience consists of deeper and more active learning tasks that are not solely modeled by the instructor. The blended modality requires teachers to rethink their instruction and create experiences that are novel or that they have never tried in a traditional or online classroom environment. Faculty are challenged to re-evaluate their content and how they teach. Blended learning requires that teachers put a considerable amount of time into a lesson that takes place outside of the purview of their classroom. In asking teachers to take such a leap, it is important that they are supported, yet orthodox and generative views

of higher education pedagogy offer little solace to the professor who now needs to design investigatory and creative learning opportunities through a Learning Management System (LMS).

As teachers at our institution undertook an opportunity to pilot blended learning classes within their discipline, faculty began meeting once or twice a month. Though not mandatory and not billed as formal professional development, these ad hoc meetings allowed blended learning instructors from multiple colleges and disciplines to discuss and share challenges and triumphs encountered as they engaged students in this new modality. Through the collaboration and support instructors sought in these informal roundtables, a Professional Learning Community (PLC) had unwittingly been established. PLCs have been discussed as a vehicle for collaboration within many sectors, but particularly in education. Annenberg Institute for School Reform (n.d.) differentiates PLCs from other professional development by the fact that they are ongoing, context specific, aligned to a goal of reform or change, and "grounded in a collaborative, inquiry-based approach to learning" (p. 1). Instructors from various disciplines, who embarked on the blended learning experience for the first time, formed a PLC to share their experiences. The current qualitative study was conducted to capture the impact of the PLC on the blended learning first year experience for faculty, through the use of surveys, faculty interviews, and meeting notes. This data clearly shows that the PLC provided necessary support to teachers implementing blended learning, which ultimately impacted the overall outcomes of students in their classes in positive ways.

Literature Review

In reviewing the literature for this study, a brief synopsis of blended learning, the faculty preparation necessary to implement blended learning, and the role of PLCs in supporting this faculty preparation will be summarized.

Blended Learning

Blended learning is defined and described in the literature in a variety of ways. Kitchenham (2005) defined it as the combination of Internet and classroom resources to provide students with specific skills. Pape (2010) provided one of the most elaborate definitions of blended learning, describing it as an experience that goes beyond the walls of the classroom and that appeals to diverse learning styles, fosters independent learning, and includes online options to enhance the learning experience. For the purpose of this study, blended learning will be defined as a combination of traditional classroom methods and online digital media and technology. Instructors who teach blended learning classes work to create opportunities for students to explore course topics both inside and outside the classroom. More specifically, blended learning will be defined as a class that meets 50-70% of the assigned class time in the face-to-face classroom setting and spends 30-50% of the assigned class time completing course work in a different setting.

Faculty Preparation

King and Arnold (2012) identify course design, communication, and motivation as the three most important factors for faculty to consider in successfully implementing blended learning. Planning for activities that promote active and self-directed learning along with increased use of technology involves a rethinking of teaching practice on the part of instructors. Classes may require revision or a complete redesign to support a learner-centered approach, as this is the key to blended learning (Bates, 2010; Napier, Dekhane, & Smith, 2011). A change in the delivery method, as well as the teaching style, needs to be considered and accommodated to ensure success. Due to the nature of implementing these "planned" and "pedagogically valuable" experiences (Laster, Otte, Picciano, & Sorg, 2005), which provide meaningful learning in areas where a professor might be used to simply lecturing content, faculty must be prepared for an investment of time in planning for blended classes (King & Arnold, 2012).

Lesson planning for blended courses requires different considerations than lesson planning for traditional seated or online courses. Instructors are challenged to identify how to introduce topics in class and expand upon those topics through independent learning activities. This should be considered, because a portion of the face-to-face instruction is replaced with time spent outside of class participating in activities and assignments that reinforce concepts previously introduced. Instructors should also focus on finding engaging ways to allow students to interact with the material. One researcher recounted that it took three weeks of intensive preparation to have a pilot three-week blended unit within a traditional course ready to go; as the unit was presented, refinements were made based on student and course needs and feedback (Kenney & Newcombe, 2011). Creating active learning activities can be challenging for instructors as class time and the online environment are both considerations (Singleton, 2013). Additionally, preparation prior to implementing technology into the blended learning environment is also critical. This may include teachers participating in professional development activities that provide the opportunity to utilize new technologies prior to incorporation into their curriculum. This type of hands-on learning experience allows them to use a variety of technologies and gain experience with them prior to implementing them into blended learning classes.

All these disparate considerations should be taken into account when instructors begin teaching in a blended environment. This additional planning time and commitment can be a challenge to instructors; one way to support faculty through implementation is in peer groups where they can "deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger, McDermott, & Snyder, 2002, p.4). The creation of a PLC to provide this needed support became important for the successful implementation of blended learning courses.

Professional Learning Communities (PLC)

PLCs are referred to by many different names; however, in reviewing the literature, it was determined that the goals and outcomes for the groups assembled was consistent: to support the faculty who were participating in the groups. Teaching strategies were shared, advice was provided, and support was felt by those who participated. Below is an overview of the research on PLCs.

Background. Professional development for teachers who are embarking on new methods and modalities of teaching is important. To ensure that teachers have the best opportunity for success, they need to be supported by their colleagues and administration. Stacey and Gerbic (2008) called for more investigation of "successful models of professional development and support of teachers who take up this new mode of teaching [blended learning]" (p. 967). Pape (2010) supported this claim by indicating that more research was necessary to determine the best

professional development practices for blended learning. However, existing research did support the fact that traditional professional development workshops and trainings needed to be supplemented or completely replaced with PLCs (Pape, 2010). In a study conducted by Pape (2010), when face-to-face study groups were created and began to meet regularly to discuss curriculum development and to share results about blended learning, there were positive results for both the instructors and the students. This was a key element that led to successful implementation of blended learning.

In a synthesis of 11 different empirical studies on PLCs, Vescio, Ross and Adams (2008) identified four essential characteristics that are shared by effective PLCs. The first is collaboration between faculty, which required providing them the opportunity to be open in their practice, reflect on their practice, and ultimately engender change. A focus on student learning is also necessary, because the ultimate goal of collaboration and reflection is to impact students. Teacher authority allows the teacher to make the most advantageous decisions for their learners and enables them to experiment and innovate. Finally, continuous teacher learning makes the experience a form of professional development in which teachers are constantly self-evaluating and engaged in becoming better teachers (Vescio et al., 2008).

Benefits and Goals. Cochrane-Smith and Lytle (1999) see PLCs differing from other kinds of professional development efforts in the primacy of the teacher. Where professional development may be seen as giving teachers knowledge, PLCs shift that model so that faculty instead explore their own knowledge of their practice. Benefits of PLCs included better understanding of personal teaching philosophy, more confidence in capability of implementing technology, collaboration and relationships formed with colleagues outside of their discipline (Stacey & Mackey, 2009). In addition, other benefits of participation in PLCs included an increase in faculty motivation and job satisfaction, development and maintenance of faculty relationships, and reduced faculty burnout (Roth, 2014). Improved teaching practices, including reduced time lecturing and increased implementation of active learning opportunities for students, benefits the faculty and students in the class (Roth, 2014). In most cases, teaching practices were improved.

When the goal of the PLC was improving student learning, faculty from various disciplines could come together and share ideas. Cross-discipline professional communities facilitate new ideas and practices (Roth, 2014). PLCs establish support for teachers who feel isolated in their profession, which helps to improve teaching practices and impacts student learning (Roth, 2014). Interdisciplinary design fosters individual learning, critical thinking, and communication skills as new practices and ideas as shared across disciplines.

Group members are considering and integrating concepts and ideas from multiple disciplines into an existing framework that allows for professional and personal growth (Moore & Carter-Hicks, 2014; Stacey & Mackey, 2009). The teaching discipline is secondary to the desire to learn from each other, share common interests, and work toward a common goal (Roth, 2014). Collaboration leads to the implementation of new teaching practices, which encourages further discussions in future meetings (Stacey & Mackey, 2009)

Our Blended Experience

Implementation of blended learning at our university began during a pilot summer session with a single introductory math course. In the fall, blended learning classes were offered in six courses in two colleges, including math, sciences, and psychology, and eventually composition was added in the spring. Course objectives and competencies in these blended courses remained the same as the traditional courses. The model is a mix of face-to-face and online class meetings, either 33% outside of the classroom for classes that meet three times a week or 50% for classes that meet twice a week. Though institutions might view blended learning as a cost saving measure to increase the number of course offerings without having to build additional classrooms, instructors participating in this particular pilot study remained in the classroom on the independent, or blended, days. Students were afforded the opportunity to work in the classroom or ask the instructor questions, though they were not mandated to be there. On the independent learning days, learners were asked to complete assignments that went beyond the scope of the traditional course lessons. Deeper learning was fostered with extensive promotion of critical thinking skills that focused on deeper applications of the curricular competencies. Many of the lessons included applied problems that related directly to their majors or the contemporary workplace.

As these courses began, instructors involved in teaching blended learning courses started to meet regularly. The courses being offered in the blended learning modality were initially housed within two colleges. In the spring of 2015 another course was added which was housed in a third college. Therefore, the PLC meetings and discussions were increasingly interdisciplinary in nature. Initially instructors met every two weeks to discuss and share their progress and struggles within this new modality. However, considerations were made regarding the number of meetings that faculty are expected to attend; therefore, it was decided that the PLC would meet monthly. An agreed-upon day and time was established. These meetings, though formally calendared and highly encouraged by the

administration, were largely voluntary, and there were no repercussions if a faculty member's schedule precluded their attendance.

This study recounts and summarizes the perspectives of faculty from various disciplines who met once per month to share best practices, discuss concerns or challenges, and support one another as they implemented a blended learning model into one of their classes. The purpose is to provide an overview of the experiences of the faculty who participated in the PLC and to detail the interdisciplinary nature of the meetings. Additionally, an exploration of how the meetings led to the creation and management of meaningful blended learning experiences will be discussed. Finally, the effectiveness of the PLC in supporting faculty who taught in this modality will be promoted as an effective method for professional development in implementing blended learning.

Method

This study analyzed the perceptions and experiences of eight faculty members who implemented blended learning for the first time. Faculty members were from a variety of disciplines including math, English, psychology, business, physics, and biology. In order to be included in this study, the instructor had to teach one blended learning section of his/her respective course during the summer, spring, or fall semesters. Instructors, who agreed to teach a blended learning course within this timeframe were considered to be part of a pilot group. Of the seven instructors, six taught fulltime in the face-to-face modality and one taught fulltime in the online modality. One of the instructors who taught fulltime in the face-to-face modality had two years of online teaching experience. None of the instructors had experience in teaching a blended learning class prior to this experience.

Table 1
Faculty Perceptions of PLC

Statements (n=6)	Strongly Disagree(%)	Disagree (%)	Neither Agree or Disagree (%)	Agree (%)	Strongly Agree (%)
I looked forward to sharing my experiences with my colleagues at our blended learning meetings	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (50.0%)	3 (50.0%)
I gained valuable information from hearing about my colleagues' experiences	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (16.7%)	5 (83.3%)
I often felt like I wanted to be there more than I had to be there	0 (0.0%)	0 (0.0%)	1 (16.7%)	3 (50.0%)	2 (33.3%)
After hearing about different techniques and my colleagues tips and experiences, I would often experiment with those ideas in my own blended classes	0 (0.0%)	0 (0.0%)	1 (16.7%)	3 (50.0%)	2 (33.3%)
The blended meetings enhanced my teaching and student outcomes	0 (0.0%)	0 (0.0%)	2 (33.3%)	4 (66.7%)	0 (0.0%)
Overall, the blended learning meetings were helpful and supportive in my experience of teaching blended learning	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (33.3%)	4 (66.7%)

The faculty also participated in a PLC that was formed and facilitated by a dean from the College of Humanities and Social Sciences, which houses the disciplines of English, math, and psychology, all of which were represented in the blended pilot; however, faculty from disciplines in other colleges, including the physical and biological sciences and business, were also included in the blended project and the PLC. The PLC employed an informal roundtable format and met one time per month for one hour. During each meeting, everyone who participated in the group was provided the opportunity to share their experience with the blended learning class. An administrator was responsible for time-keeping to ensure the meeting moved along and that everyone was given the opportunity to share and receive feedback from peers. Administrative facilitation was limited to listening and connecting ideas among faculty rather than attempting to solve problems or critique approaches being described.

Data Sources and Analysis

Interviews and surveys were used to collect information from faculty members who taught blended learning courses in the fall and/or spring semester. Faculty interviews were conducted at the end of the fall semester for all faculty who taught a blended learning course. The interviews were transcribed and coded. In addition to the interviews, a faculty blended learning survey, consisting of seven Likert-style questions and three short answer responses, was administered to collect information from instructors. Finally, notes from the monthly PLC meetings were used to support information reported in the interviews or provided on the faculty survey.

Surveys. Six out of eight faculty members completed and returned the faculty survey that was distributed at the end of the first year of blended learning. The survey consisted of ten items including seven Likert-style questions and three short answer questions (Appendix A). The survey gathered feedback on the blended meetings that were held in the first year of implementing blended learning classes. The seven Likert-type scale questions were run through SPSS for basic descriptive statistics (Table 1) while the three short answer response questions were coded to identify emergent themes.

Interviews. Faculty interviews that were conducted at the end of the first semester were analyzed and coded. The Center for Innovation in Research and Teaching (CIRT), a faculty driven initiative that facilitates excellence in research and writing, conducted the interviews and collected the data to help to make the interviews more anonymous. These five interviews asked open-ended questions about the faculty's general views and experiences piloting the blended classes. These interviews were later transcribed and provided to the research team. They were then analyzed and coded for theme (Table 2)

Meeting notes. At the monthly meetings, a note-taker recorded the responses from each participant. Different challenges as well as successes were shared during these meetings. At each meeting participants would briefly describe how their class was progressing; what, if any, challenges or struggles they faced; and what was going really well. Teaching pedagogy, class management, struggling students, LMS issues, and overall feelings about the blended learning classes were shared during this time. These experiences were all captured at each meeting.

The text of the surveys, interviews, and meeting notes were hand-coded into meaning units by each researcher. The researchers each coded individually to gain better facility and understanding of the data prior to meeting altogether. After this initial coding, researchers then met to share their codes and to further analyze and categorize the data into themes based on shared characteristics that the researchers found in the interpretation of the data (Saldaña, 2013). Over the course of several discussions of categories and themes, inter-rater reliability was established between researchers and individual understandings, and codes were solidified into agreed upon themes as outlined in the next section.

Results

In a survey of faculty participants, all strongly agreed (50%) or agreed (50%) that they looked forward to sharing their experiences with colleagues in the PLC (Table 1). One participant stated, "More than anything else, the meeting gave moral support, a sense of not being alone." The theme of support was echoed by others who stated, "[I]t was reassuring to know that I was not alone in the experience," and, "[I]he meetings were a great support." Additionally, they reported gaining valuable information from listening to their colleagues' experiences. In regard to the motivation to join the group, five members reported "wanting" to be involved rather than feeling an obligation or being required to attend the meetings. One participant reported neither agreeing nor disagreeing with this statement of motivation to be a part of the group.

Five out of six participants in the PLC reported experimenting with different ideas that were shared in the PLC. Overall, all of the participants reported that the PLC was helpful and supportive in their experience of teaching the blended learning class.

In addition to the Likert responses, survey short answers and interview responses were analyzed. Themes identified included support, collaboration,

Table 2
Examples of Participants Perceptions of Blended Learning

Theme	Examples
Support	"moral support"; "a sense of not being alone"; "provided encouragement"; "the meetings were a great support"; "encouragement along the way"
Collaboration	"able to brainstorm ideas"; "brainstorming provided new learning experiences to be implemented into the classroom"; "it helped me to realize that we often face common challenges but each of us had a different take on the solution so it was great to see different approaches"; "great help to hear about techniques my colleagues used in their blended classes"; "shared best practices" "could experiment with new things in my teaching"; "helped me to create stronger learning experiences"
Comfort	"sharing of ideas and issues made me feel more comfortable teaching blended"; "helped me personally to be comfortable with my implementation"
Student Experience	"the meetings helped me make better decisions on course structure and delivery and that helped with student outcomes"; "helped me be more prepared therefore the students benefited from it"; "allowed me to help students with the blended format"; "an idea from my blended class has since been implemented in all of my classes"; "positive effect on the student outcomes in all my classes, not just the blended section"
Preparation	"I think that was very similar to a regular class."; "it wasn't an unreasonable workload."; "The work is not the same, of course, but is not 10 times more."

comfort, student experience, and preparation. Faculty reported that the PLC provided moral support, a feeling of not being alone, and encouragement. Participants openly discussed their experiences and challenges while receiving feedback from their peers who were sharing those experiences in their classes. One participant stated the following:

I considered pulling the plug on the blended learning experience when technical issues plagued my class causing a lot of confusion for students in the beginning of the semester. However, the support from others teaching blended learning classes provided me the support to continue with the experience during the technical difficulties and once they were resolved.

Collaboration led to the ability to step outside of one's comfort zone and try various teaching strategies in the classroom. Through the realization that, due to the nature of our disciplines, "we often face common challenges, but each of us had a different take on the solution," a new approach could be considered and implemented. When one peer reported successful implementation of an activity or teaching technique, this "offered insights to improving practices" for the entire group. For example, one instructor reported that her students particularly enjoyed working in teams on the blended days; this inspired another instructor, who had previously only provided individual activities, to employ collaborative assignments for some of the independent learning days. The shared information and collegial support allowed for more experimentation in each instructor's pedagogy and encouraged them to try teaching approaches not always highlighted within their discipline.

Collaboration led to feeling comfortable in the implementation of blended learning experiences. It provided confirmation that there is not one correct way to conduct a blended learning class. One participant reported, "Listening to the different ideas and methodologies used by my colleagues helped me realize that not all blended learning looks the same. It made me comfortable with my implementation." Another instructor reported that though she "did not directly implement anything gleaned from a colleague," she reported that "the encouragement along the way helped me personally to be comfortable with my implementation." In addition, comfort came from feeling better equipped to teach in this modality. By attending the PLC meetings, instructors reported feeling more prepared and, therefore, more comfortable in implementing blended learning.

Student learning experiences were impacted indirectly through the PLC meetings as reported by the instructors. One participant noted that the experiences shared in the blended learning meetings had a positive effect on student outcomes because "they helped me be more prepared, therefore students benefit from it." Activities that were successfully implemented in the

blended learning section of the course were often later implemented into traditional sections of the course being taught by the same instructor. One instructor explained, "An idea from my blended learning class has since been implemented in all my classes. This idea alone has had a positive effect on the student outcomes in all my classes, not just the blended learning section." In addition, the opportunity to discuss pedagogy with other instructors from various disciplines helped in "making better decisions on course structure and delivery, and that helped with student outcomes."

However, in regard to the work of preparing for the classes—for example, classroom management, grading, and working with students—there was not consistency among the responses faculty provided. One faculty member reported that the workload was about the same and that the type of work was just distributed differently: "But as far as managing the class otherwise, getting the grades in and working with the students, I think that was very similar to a regular class." This instructor reported that "it wasn't an unreasonable workload." Interviewee 2 supported this by stating, "The work is not the same, of course, but is not 10 times more." However, Interviewee 2 then went on to report, "[I]t was a little tricky to handle the grading and making sure that the students get feedback for their work."

Meeting notes from the PLC meetings reflect a framework for the discussions that were most pressing to the instructors. Notes while roundtable sharing in meetings captured the present concerns, challenges, and triumphs in comments such as "going well," "students are responding to visual pieces," and "trying to figure out the best place to post something." These meeting notes were used to triangulate data from the surveys and interviews and helped to provide the framework of topics in the discussion section.

Discussion

There is a learning curve for instructors preparing to teach a blended learning class for the first time. At the beginning of this pilot program, many instructors reported planning as if they were teaching a new class. Blended learning was not something that they had experienced before, and even those who had traditional and online teaching experience were stymied in how to adjust lessons and materials to fit to the blended learning modality. Within the PLCs, faculty were able to share ideas, shortcuts, and time management strategies, which assisted with feeling less overwhelmed and more prepared for the semester ahead.

Preparation and Classroom Management

The literature identifies that preparation for a blended class is different and can put added demands on the instructor's time (King & Arnold, 2012), but supports and best practices shared in a PLC helped to overcome some of those challenges. Faculty teaching blended learning classes for the first time had different perspectives regarding the preparation, perhaps based upon their discipline. One faculty member reported the following:

> Initially, I thought that it was going to be very easy and that was not the case. It was not difficult but it was thinking about teaching differently than I had taught before. I thought that with using my ground and online experience that I would just combine those together and then you would get blended learning. I found that that did not necessarily work out the way that I thought it was going to. I had trouble in the beginning.

Another faculty member reported that in implementing blended learning, "You get pushed out of your comfort zone, and you have to figure some things out."

A variety of different topics were mentioned in regard to the workload for blended learning instructors. One dilemma was whether an instructor should simply adjust existing material used to teach the same class in a traditional face-to-face setting or create all new materials to fit the new learning environment being implemented. Instructors expressed that preparing for the blended learning class took considerably more time than preparing for a traditional class. They compared it to preparing to teach a class for the first time, even though they were teaching the same curriculum in traditional classes. Interviewee 1 stated, "I think for me, there was a little bit more work in preparing what they had to do during the week." Interviewee 3 also felt there was more preparation, because of the following:

> [Y]ou [are] trying to really find something that is engaging for the students and getting things organized. So there's a lot of prep work, I think with this class more than other ones I have done, but I think that if it continues that it will probably decrease a bit.

In addition to supporting each other, collaboration encouraged brainstorming to problem solve. This also generated ideas to provide new learning experiences in the classroom since they came from various disciplinary perspectives. The way a physics instructor might approach explaining a difficult concept is likely different than how a composition instructor might approach a challenging writing task, yet in discussing these concerns through the lens of blended learning, faculty garnered new approaches. As one group member would share an activity that he/she conducted, others would take notes and consider ways to implement or modify that same activity for their

classes. Using an informal roundtable format, this environment was intended to provide a different approach to classroom design and facilitation issues where faculty felt free to share their own challenges in a non-judgmental environment. The new approach may or may not lead to a better outcome, but it would have never been considered if not for time set aside for the group to collaborate.

The PLC was valuable in that it helped instructors to realize they were not alone. The instructors shared the same feelings and views in regard to the workload and preparation for the blended learning class. By discussing best practices, instructors were able to take ideas that were shared and work to implement them into their classes. They were also able to report if the strategies or techniques shared and implemented worked or did not. This helped to determine if the problems experienced were unique to the blended learning experience or if they were discipline-specific.

Faculty who participated in the PLC freely shared their positive experiences and the challenging aspects of blended learning. By sharing experiences in the group, members were able to receive support in areas in which they encountered difficulties; faculty also shared ideas that were working well, allowing others in the group to decide if they wanted to integrate the new shared learning strategy into their own classroom. In these exchanges we found support for the idea that there are pedagogical benefits alongside greater understanding when learning from each other through "disciplinary dialogues and collaboration" (Baker & Däumer, 2015, p. 51).

LMS and Classroom Management

Classroom management was sometimes found to be a challenge when the online discussion forums were being used in larger classes. Some of the blended learning classes had more than 90 students enrolled. In PLC discussions, best practices for using the discussion forums were shared. It was suggested that rather than individual posts, students could work in groups and post completed work to be reviewed in the forums. This would reduce the number of posts in the forums. It would also ensure collaboration among the students as this was the goal in the use of the discussion forum Also, initial technical issues with the LMS led to some student and faculty confusion. There was a glitch in the discussion forum in one of the blended learning sections; therefore, students were not able to complete tasks assigned on the blended learning days. Once the issue was identified and corrected, this problem was alleviated; however, during the diagnosis and correction, the PLC helped to support and encourage the instructor who was struggling. The instructor considered canceling the blended learning experience for the semester and returning to a traditional modality.

However, colleagues came forward with suggestions to help alleviate the technological problems until they could be formally corrected. This support and the suggestions that were made encouraged the instructor to continue and complete the semester with successful outcomes.

Future PLC Meetings

These PLC meetings also created a yearning for even more collaboration. One instructor suggested that in future semesters the PLC meeting should begin by each instructor taking a turn at providing a 10-minute "mini-teach" to demonstrate and describe a method used in their blended classes in hopes of seeing "more discipline-focused examples to determine if they could be modified to fit my discipline."

Limitations

Within this study, several limitations were noted. This was a pilot study; therefore, the information collected serves as a baseline. The effectiveness of PLCs was founded in this study, but comparisons cannot be made. Additional studies on PLCs in blended learning will help to determine the effectiveness of PLCs in higher education to support faculty who are embarking on blended learning.

Additionally, the data that was analyzed in this study was self-reported. The participants shared their experience in the PLC and with blended learning in face-to-face meetings, as well as in a survey at the end of the semester. Due to the very small sample size and based upon information that was shared in the meetings, it was hard to maintain confidentiality in this study. The lack of confidentiality may have had an impact on the way that individuals responded in the meetings and on the surveys.

Conclusion

Findings from this preliminary study identify important aspects of faculty experiences and their need for support in adapting to teaching in a blended learning environment. Professional learning communities may be the avenue to promote effective faculty collaboration and to sustain support for one another. Further research should be conducted by expanding the population surveyed and interviewed to different college campuses nationally and internationally. As groups continue to meet in the second and third year of implementation of this professional development support model, it will be interesting to observe if and how the group evolves when individuals have more experience and knowledge. Continuing to conduct research on PLCs that incorporate diverse academic fields such as fine arts, theology, and education, in addition to the disciplines

already represented, would be an area for possible expansion on this topic. This present study contributes to a growing body of research addressing pedagogy and practices in the blended learning environment and to a foundation for increasing interdisciplinary collaboration among professionals in higher education.

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Exploring the Intersections of Interdisciplinary Teaching, Experiential Learning, and Community Engagement: A Case Study of Service Learning in Practice

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Virginia Tech

In 2009, the National Academy of Sciences (NAS) called for more interdisciplinary and community-engaged approaches to teaching and learning in the agricultural and life sciences to better respond to the food system challenges of the 21st century. As a result, institutions from across the nation have responded with a number of experiential learning and service-learning frameworks and practices aimed to enhance the academic experience for both student and community stakeholders. Sustainable agriculture education, with its explicit focus on experiential learning, interdisciplinarity, and values-based programming, has emerged as a promising approach to strengthen the fabric of agriculture and life sciences education. The purpose of this paper is to illustrate the complex role of service learning as a central approach to undergraduate teaching and learning where interdisciplinary teaching, experiential learning, and community engagement are core goals. Specifically, we conducted a single embedded case study of a sustainable agriculture education program at a land grant university to explore how this triad was organized and possible service learning outcomes. Our case study was informed by semi-structured interviews of faculty and community partner stakeholders, participant observations of faculty and students, and secondary data analysis of course syllabi and other programmatic artifacts. Despite different understandings and practices of service learning by faculty within this, we found a common core of best practices. We conclude with criteria and best practices to guide teaching and learning from this triad perspective.

The collegiate experience is an ever-moving target where administrators and faculty attempt to enhance teaching and learning to ensure the highest competency of graduates to attain employment or pursue a graduate degree. Teaching and learning invariably cycles through new and innovative approaches, while the core of the practice remains historically the same. The National Academies of Science (2009) and The Association of American Colleges and Universities (AAC&U) prime the conversation toward the need for engaged, student centered pedagogy and high impact practices identified by George Kuh (2010). Evidence-based high impact practices that when designed, implemented, and assessed effectively have been found to help student persistence and increase learning gains are first-year seminars and experiences, common intellectual experiences, learning communities, writing-intensive courses, collaborative assignments and projects, undergraduate research, diversity and global learning, service and community-based learning, internships, and capstone courses and projects (Kuh & O'Donnell, 2013).

High impact practices across college campuses continue to advance student success. Service learning is one high impact educational practice (Kuh, 2010) that engages the student, university, and community in learning through authentic situated experiences where individuals learn through participation and engagement (Fenwick, 2003). However, ensuring that the authentic experiences are occurring with full participation and meaningful engagement is frequently challenging. Often, the mark is missed with experiences situated on the periphery of complex community organizations, as Jacoby (2003) describes, a kaleidoscope lens where all

of the facets of service learning collide. We introduce a framework and best practices for exploring the practice of service learning through interdisciplinary teaching, experiential learning and community engagement as a core to situate the student, university and community in a reciprocal and authentic experience. We posit that service learning as a pedagogical practice fosters experiential, interdisciplinary and community-engaged curricula. An in-depth discussion of the literature sets the conceptual and programmatic stage for this case of service learning in practice. The discussion of the literature is then followed by the design and results of a single-embedded case study which explored an interdisciplinary sustainable agriculture education (SAE) minor in which the practice of service learning is central to the student experience. The centrality of experiential, interdisciplinary, and community-engaged curricula within this case study sets the stage for broader conversation of implications across disciplines.

Experiential Learning as Foundation

Experiential learning historically is defined as "learning by doing" in the most practical sense and as connecting education to personal experience in the most organic, and it is informed by the work of John Dewey (1938). If experiential learning is understood as values-based, then all education is created within experience, but not all experiences are equally educational (Dewey, 1938). Creating a dualistic view of experiential learning, Dewey (1938) describes the traditional structure of education as disjointed experiences where the connectivity is lost upon the student and further

Figure 1
Triad model for service-learning pedagogy
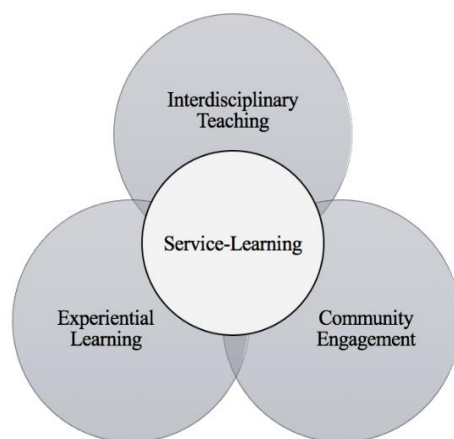
growth hindered due to the lack of quality within the experience. A clear conceptual view of experiential learning takes into account the embeddedness of mind and body in experience which is shaped by previous and future experiences (Dewey, 1938). Fenwick (2003) cautions the philosophical beliefs of experience in everyday life where experiential learning must have clear boundaries established before all experience becomes coopted as experiential learning. Dewey (1938) spoke of philosophy in his seminal work "Experience and Education," making transparent the need to state philosophical underpinnings of experiential learning as methodology. Translating experiential learning to a widely used model, Kolb (1984) suggests that learning happens when meaning making of experiences occurs. The experiential cycle depicts meaning making consisting of having concrete experiences, reflecting on those experiences, conceptualizing, and experimenting (Kolb, 1984). These conceptual starting points guide a large literature base on experiential education; however, there are aspects missing from these frameworks that are being further discussed in conversations on the changing needs of undergraduate curriculum.

Focus on the split of mind and body introduced by Fenwick (2003) as a place of contention, with the experience of learning being broken down into measurable parts. Experience in a holistic sense should be addressed by taking into account the temporal, spatial, and historical context of the learning environment interwoven with behavior, choice, language, culture, and society (Fenwick, 2003). "Accepting the moment of experiential learning as occurring within action, within and among bodies…understands the body as a site of learning

itself, rather than as a raw producer of data that the mind will fashion into knowledge formations" (Fenwick, 2003, p. 129).

Sustainable agriculture education addresses many complex issues facing society today, including "ecological or environmental health benefits; economic viability and a policy resource use that does not compromise the lives of future generations; and social benefits including social justice, human empowerment, and human health and safety" (Delate, 2006, p. 445). Incorporation of multiple disciplinary perspectives relevant to interdisciplinary exploration, a triad approach to teaching and learning (Figure 1), exemplifying experiential, interdisciplinary, and community-engaged approaches and frameworks has emerged as a best practice (Clark, Byker, Niewolny, & Helms, 2013; Hammer, 2004; Jacobsen et al., 2012; Niewolny et al., 2012; Parr, Trexler, Khanna, & Battisti, 2007; Parr & VanHorn, 2006). SAE represents an emerging field in agriculture and life sciences in which experiential learning is a core component (Clark et al., 2013; Grossman, Sherard, Prohn, Bradley, Goodell & Andrew, 2012; Hammer, 2004; Niewolny et al., 2012; Parr et al., 2007; Parr & VanHorn, 2006). Parr and Van Horn (2006) developed seven guiding principles to describe the practice of teaching and learning within SAE programs: 1) interdisciplinarity, i.e., integration of natural and social sciences; 2) experiential learning, i.e., learning tied to purposeful activity with integration of theory and practice; 3) systems thinking, i.e., holistic understanding of complex systems; 4) skill development, i.e., practical and social skills; 5) linking of the real world with classroom, context, and real-world problem solving; 6) community building with students, staff, and faculty;

and 7) adaptive curriculum management, constant feedback, and change of innovative curriculum. Furthermore, when examining the need for curriculum in SAE through the participation of stakeholders in a Delphi study, the concepts of content knowledge, experiences, and skills were addressed as necessary to prepare students for transition to the career field (Parr & Van Horn, 2006). Parr and Van Horn (2006) found that experiential learning helps students develop lifelong learning capacity, attitudes, conscious awareness, and applicable skills (Parr & Van Horn, 2006). Hands-on experience, holistic views of teaching and learning, transformative change, and the importance of the context/environment in which learning occurs is central to curricular design (Battisti & Passmore, 2008; Francis, Jordan et al., 2011; Galt, Parr, Van Soelen Kim, Beckett, Lickter, & Ballard, 2012; Hammer, 2010; Parr & Trexler, 2011; Parr & Van Horn, 2006).

Parr and Trexler (2011) recently evaluated hands-on programs and observed the use of experiential learning theories in practice "where horizontal co-construction of knowledge, rather than simply privileging faculty expert transmission" of knowledge, occurred (Parr & Trexler, p. 178). The researchers suggest the most effective learning approaches share certain commonalities in which experiential learning components stand out: 1) the integration of theory and practice into coursework and fieldwork; 2) incorporation of learner-centered activities that emphasize peer-to-peer social relations, and 3) the application of facilitation and mentoring as core instructional methods. Examples of experiential learning in practice range from short-term and long-term service-learning opportunities and capstone projects. Service learning incorporated into a semester long course or spanning the students' progress through an academic program can vary greatly. For example, a semester long service-learning experience could include 20 hours of fieldwork with a community partner and a tangible outcome, such as a project presentation or proposal paper (Clark et al., 2013).

Interdisciplinary Teaching and Multiple Knowledge Perspectives

Conceptualizing interdisciplinarity is a mode of inquiry that relies on multiple knowledge perspectives and methods of inquiry that embodies activity within social interactions and includes a continuum of actions that start with a communication of ideas and spans to a formal collaboration of ideas (Lattuca, 2001). Interdisciplinarity, when viewed through a sociocultural lens, recognizes disciplines as cultural tools where individual thinking and activity are influenced by the discipline that the individual is situated within (Lattuca,

2001). Interdisciplinary teaching requires the blending of different "disciplinary languages," which Lattuca and Creamer (2005) equated with: 1) expanding or increasing the fluency in disciplinary languages, 2) learning new methods of inquiry and new concepts and understanding of a phenomenon, 3) connecting with different scholarly communities, and 4) enhancing practices and beliefs. Further, Lattuca and Creamer (2005) found that when faculty respond to challenges to their own discipline-based understandings, their professional identity and epistemological views shift.

Academic work traditionally segments knowledge into specific disciplines, as exemplified by the longstanding separation of the natural and social sciences. The danger of continuing this segmented model is losing understanding of how all of the pieces and parts interact (Lattuca, 2001). Godemann (2006) described the complexities of generating knowledge that can solve today's complex problems as requiring know-how that spans society and educational contexts and surpasses the scientific community and disciplinary methodology. Conceptualizing interdisciplinarity as a mode of inquiry that relies on multiple knowledge perspectives and methods, as well as embodies activity within social interactions, offers guidance to practice. Godemann (2006) also communicates a clear definition: interdisciplinarity seeks to answer complex problems that span multiple disciplines where "new knowledge structures are established by the integration of different disciplinary perspectives theories and methods" (Godemann, 2006, p. 52). Important to note is the distinction between multi- and interdisciplinarity. Multidisciplinarity takes into account multiple disciplinary perspectives but does not integrate these to create an interdisciplinary understanding of a problem (Zalanga, 2009).

Faculty involved in interdisciplinary research and teaching reflect on their own and other disciplines, thus gaining new knowledge and perspectives. Moreover, considering faculty work as learning through a sociocultural lens in a collaborative and interdisciplinary manner can create space for new approaches to research, teaching, and extension/service in higher education. Enhancing curriculum in higher education through partnerships between institutions, colleges, governmental and non-governmental organizations, and the community would be the first step toward an interdisciplinary education.

Community Engagement and Social Change

Community engagement is evolving as a practice that academics, practitioners, and community stakeholders use to incorporate a wide array of efforts to connect *local* and *civic* initiatives. This emerging paradigm supports these initiatives in higher education by emphasizing community-based

learning opportunities and experiential approaches to engaged campuses. One important way of fostering a civically and politically engaged and socially responsible undergraduate is through service learning and volunteerism opportunities that result in true educational engagement (Strand, Marullo, Cutforth, Stoecker, & Donohue, 2003). Similarly, Butin (2010) described an ideal scholarship of engagement reflecting the mission and/or vision of universities, with service-learning and/or community engagement being everyday threads to faculty-student interactions. Therefore, engagement is an essential component to SAE curricula, connecting students, faculty, and community together in a mutually beneficial learning process and providing "an opportunity for all, faculty, staff, students, and public, to learn together in seeking solutions to real problems" (Byrne, 2000, p.17).

The scholarship of engagement is a movement in academia toward revitalizing teaching, research, and service (Austin, 2010). Votruba (2010) emphasized the important role of engagement in higher education, suggesting that engagement should be institutionalized as a core area academic concern the same way that research and scholarship are prioritized. Glass and Fitzgerald (2010) listed three qualities that should be inherent in an engaged campus and in engaged scholarship overall for social change. Engagement should: 1) have a scholarly goal with resulting knowledge benefitting both academia and society; 2) cut across the mission of teaching, research and service and cannot be separated from the core mission of institutions; and 3) be reciprocal, be mutually beneficial, and represent a systematic relationship between university and community partners. Engaged scholarship should focus on connecting the intellectual assets of the institution to public service through community development, with faculty expertise fulfilling the institutional mission (Glass & Fitzgerald, 2010).

Reciprocity and mutual benefit between the university and community are essential for building civic community/university engagement. Community members engaged in research and education as *community intellectuals* enhance the engagement of campuses by embedding grassroots knowledge and practice into curricula (Wynne, 2006). Establishing trust, respect, and appreciation between faculty, students, and community partners foster social relationships that are mutually beneficial. These academic-community partnerships have the potential to enhance academic scholarship via the development of civically-engaged curricula. Moreover, communities benefit from such partnerships, which result in greater problem-solving and decision-making capacity that can be applied in their daily lives (Wynn, 2006).

Service Learning: Bringing Together Theory and Practice

Following Fenwick's (2003) explanation of learning as a sociocultural experience and Lattuca's (2001; 2002) interdisciplinary approach to sociocultural learning, we explore and understand learning in this study to emphasize the importance of "cognition and the social activity embedded...through interactions with others, with the tools of different communities of practice, and in a variety of contexts" (Lattuca, 2002, p. 719). Specifically, we draw upon Lattuca's (2002) interdisciplinary approach as a way to highlight how disciplinary positions frame assumptions, practices, processes, values, and relations to other disciplinary perspectives. Lattuca (2001) provides insight into interdisciplinary teaching as a sociocultural practice where faculty gain new teaching strategies and insights, are intellectually stimulated, and are more reflective on both their own learning and their students' learning. This pedagogical orientation views learning as both integral and inseparable from social practice and thereby promulgating mutually constitutive associations between and among activity, agent, and world. Third, Lattuca's sociocultural approach to interdisciplinary teaching, scholarship, and research reinforced how the work of faculty and community partners can and should inform interdisciplinary practice.

Service learning can be utilized to facilitate community-engaged scholarship by engaging students in complex world problems for the benefit of the local community while connecting the experience to knowledge gained in the classroom through readings, discussion, and other learning activities. Galt, Clark and Parr (2012) focus on service learning as a practice to enhance integrated learning, making connections between "course work and community and theory and practice" (p. 5). Service-oriented fieldwork is a way for students to experience working toward answering complex questions while meeting the needs of the community partner and their own (Galt et al., 2012).

When understanding service learning as a pedagogical practice, the importance of the objectives and desired outcomes of the learning activity cannot be overstated. The facilitator and student must be able to clearly define steps that need to be taken to achieve desired goals, provide opportunities for student reflection on the service experience, and measure outcomes to assess student learning and community benefits (Duncan & Kopperund, 2008). According to Kendall (1990), "Service-learning programs emphasize the accomplishment of tasks which meet human needs, in combination with conscious educational growth" (p. 40).

Duncan and Kopperund (2008) stated that all service learning must occur within a meaningful

community-based setting to become meaningful to the students participating in the program. The researchers further defined three essential criteria for service-learning, it must: 1) promote learning and academic rigor, 2) require the student to engage in reflective thinking, and 3) advance a student's sense of civic responsibility. Also important is the application of knowledge learned within classroom walls to the real world so that "*thinking…leads to action*" (Duncan & Kopperund, 2008, p. 44). Incorporating the practice of service learning into curricula also addresses problems in education identified by Rogers (2004): "[E]spoused theory is what we *say* we are doing, often with complete faith in our ability to fulfill these aims and ambitions. Theory in use is what in fact underpins the actions which we take, what we actually *do*. There is frequently a considerable gap between these two" (p. 6). The following single, embedded case study explores service learning as a concrete example of the triad approach to teaching that bridges the gap between espoused theory and practice.

Methods

Introduction of the Case: Civic Agriculture and Food Systems (CAFS) Program

The Civic Agriculture and Food Systems (CAFS) minor program within the College of Agriculture and Life Sciences at a land-grant university spearheaded an approach to community engagement through service learning by involving students, community partners, and faculty in interdisciplinary, collaborative teaching and learning. Collaborative teaching teams in the minor were comprised of faculty and graduate students from multiple disciplines and departments including agricultural education, horticulture, animal science, plant science, and nutrition, and it also included a community member serving as a community-partner liaison and an educator in the four core courses (Clark et al., 2013). This one intimately involved community partner was engaged in course design, management, and assessment, as well as leadership in the larger decision-making body for the minor while representing other community partners involved in each of the four core courses. The interdisciplinary nature and draw of the minor was further reflected in that the undergraduate student population enrolled in the minor were from all eight colleges of the university (Clark et al., 2013).

The CAFS taskforce—a decision-making body of faculty members, the community-partner liaison, institution administration, and graduate students—collaboratively developed overall programmatic core values, goals, and student learning outcomes for the minor. Undergraduates minoring in CAFS were required to take four core courses designed to build upon one another: 1) Introduction to Civic Agriculture; 2) Ecological Agriculture; 3) Concepts in Community Food Systems; and 4) Capstone in Civic Agriculture and Food Systems. The minor integrated service learning into credit-earning courses, thereby helping students to meet university requirements while at the same time strengthening community/university relationships that serve as a seedbed for community engagement in higher education (Clark et al., 2013; Galt et al., 2012; Niewolny et al., 2012).

Single Embedded Case Study: Purpose, Design and Analysis

The purpose of this study is to illustrate the complex role of service-learning as a central approach to undergraduate teaching and learning where interdisciplinary teaching, experiential learning, and community engagement are core goals. Because the study investigated a sociological phenomenon, a qualitative approach was appropriate in that the researcher was seeking to explain how things worked in context and with specific people engaged in the experience. Careful attention was paid to underlying philosophical and epistemological beliefs affecting the overall research design and process. Yin addresses some overarching themes that should be given ample attention when using the case study approach to data collection. In particular, he posed three overarching themes connecting different philosophies of case study research: (1) the triangulation of multiple sources of evidence, (2) the study of the phenomenon in the context giving attention to rich depth of detail, and (3) the process of analytic generalization as opposed to statistical methods of generalization. Using a single case study methodology also requires an in-depth understanding of the context of the particular case, which includes its social, historical, and political dynamics. This potentially complex environment requires the researcher to interpret the collected data in a way that enables him or her to extract deep meaning, i.e., knowledge that goes beyond information that can be tallied, charted, and correlated. A common use of case studies in educational psychology is for explanatory purposes such as, for example, the outcomes of a curricular approach needing to be evaluated for effectiveness (Yin, 2012). A case study approach would appropriately be used to explain how learning took place in context, using descriptive and explanatory measures in the assessment process. Furthering the usefulness of the case study, applying qualitative methods to the evaluation of an academic program would lend itself to a description of the "context, evolution, and operations of the program" (Yin, 2012, p. 144).

This study implemented a single embedded case study framework informed by Yin (2012), utilizing semi-structured interviews during the Fall 2013

Table 1
Terms that Faculty Used to Describe Service-Learning

Reciprocity	Engagement	Trust	Partners	Time	Model
Dialogue	Expectations	Observation	Community	Commitment	Scholarship
Reflection	Relationships	Purpose	Planning	Process	Value
Experience	Communicate	Connection	Problem-solving	Needs	Equity
Important	Contribute	Reality	Social	Identify	Intentionality
Participation	Citizen	Development	Optimism	Critical	Coordination
Practice	Civic	Consistency	Overwhelming	Transparency	Understanding

semester involving seven faculty members and one community partner liaison (n=8), all of whom taught in a core course and were members of the CAFS taskforce used for this study. The faculty represented six departments within the College of Agriculture and Life Sciences with disciplinary backgrounds spanning the social and natural sciences. The community partner liaison, who met selection criteria for this study due to the unique role that has been established within the organizational structure of the university, served as a collaborative teaching team member in the minor by connecting the needs and experiences of the multiple community partners engaged in facilitating student service-learning experiences in the field that ranged from brief semester long assignments to comprehensive capstone projects. The community partner liaison also functioned as the collective voice of community partners within the CAFS Taskforce. This function allowed for community partner collaboration as co-educators without impeding time burdens on the multiple partners. Selection of the community partner liaison for interviews was directly informed by the selection criteria of membership in the CAFS taskforce as well as membership in one of the four core course collaborative teaching teams.

Field observations were conducted during the Fall 2013 semester during (1) an introductory core course involving a collaborative teaching team, (2) weekly teaching team planning meetings, and (3) CAFS taskforce monthly planning meetings. The observed collaborative teaching team was comprised of two faculty from two departments, one community partner liaison, and one graduate teaching assistant (GTA), namely the researcher for this study who acted as participant-observer. The CAFS Taskforce meetings included faculty collaboratively teaching in one of the four core courses, a community partner liaison, institutional partners, college administration, one graduate student, and an administrator from the College of Agriculture and Life Sciences. It should be noted that not every member attended each monthly meeting.

Constant comparative methodology (Charmaz, 2006) was conducted using Atlas ti, the qualitative analysis software. Open coding of field notes, memos, interview transcripts and course artifacts were conducted simultaneously with data collection. Embedded and analytic memos were included in the open coding process to inform future analytic memos. Coding, using the constant comparative method, involved attaching labels to observations, interactions and collected materials that were sorted and synthesized forming tentative categories. Analytic memos synthesized data, creating a logic trail that can be traced to the individual primary documents and field notes that informed the process.

Results

When describing a framework for service learning, the triad of experiential, interdisciplinary and community-engaged curriculum was emphasized. Through an analysis of participant interviews, observational field notes and course documents (e.g., syllabi and assignment guidelines), we described the process and characteristics of an interdisciplinary minor that embeds service learning as an experiential and community engaged pedagogical practice to achieve student learning outcomes and programmatic goals. Additionally, integrating service learning at the level of a college minor rather than individual courses or short-term campus-based experiences created opportunity for recognition of community-university partnerships and service-learning curricula as academically rigorous practice. We share findings that explore best practices and challenges to implementing the triad.

The Multiple Meanings of Service Learning: An Interdisciplinary Perspective

As reported by faculty and the community partner liaison, service learning represented an essential component of the minor because it enabled students to have the experience of learning in community-based settings and, therefore, was incorporated in all core courses in the minor. However, it should be noted that the definition of service learning was not universally understood by faculty. See Table 1 for different terms

used by faculty to describe service learning. Their descriptions varied from field trips facilitated by faculty and community partners with a group service and tours done on site to the incorporation of critical reflective classroom activities connecting experiences in the field with concepts learned in the classroom.

This difference in understanding was of significance when developing a framework implemented by faculty of different disciplinary backgrounds working toward the same trajectory of problem solving complex issues while building upon student learning through the core courses toward a capstone project where the student incorporates all of the learned concepts and the experiences. For example, one faculty member shared his confusion about what service learning meant: "I get confused, what's service learning and what's experiential learning...[]There needs to be structure there, an explicit understanding of what this is meant to do."

Each core course integrated multiple community partners who volunteer to participate as educators in the field. Matching community partner interest with specific courses and students happens in conversation, further facilitated by the community partner liaison, where mutual needs and benefits were recognized and a "good fit" was established. In the introductory course, students were assigned to a community partner and then went through three steps of the service-learning approach: 1) developing a learning contract, 2) participating in group discussion, and 3) undertaking written assignments related to their service-learning experience. For the learning contract, students developed their learning goals in collaboration with their assigned community partner.

Critical and reflective thinking and writing were practiced throughout all the courses in the minor, which raised questions for faculty when they spoke about the service-learning component. While most classroom-based learning activities have well defined objectives and desired outcomes, transferring this structure to field-based activities was challenging for some faculty. Thus, faculty spoke of the importance of clearly defining steps to achieve formalizing the service-learning process and measuring the outcomes of the service-learning experiences (Duncan & Kopperund, 2008). An example of how this goal was implemented for this minor was the inclusion of input of the community partner liaison in evaluating student participation and formalized grading criteria for Fall 2013 courses.

Challenges Incorporating Service Learning for Community-Engagement

Although service learning is a potentially powerful teaching tool, faculty faced a number of challenges in implementing that component in their classes. These challenges included keeping students engaged in the

process, identifying and incorporating "good" community partners in the experience, and enlisting the participation of collaborating faculty. Faculty accepted the challenges of including a service-learning component since it afforded important learning opportunities and, in some cases, professional benefits for faculty. While the incorporation of service into scholarship and teaching practice had the potential to enhance and bring community engagement to the forefront of faculty work, prior to the development of the minor there was little support for faculty to include service learning.

One participant explained the addition of the institution to the list of benefactors in service-learning curricula: "We would not be getting the support for pulling off things like this if it wasn't going to benefit the larger institution." She expanded her understanding of service-learning from a historical perspective:

> ...[T]his is the first time I have felt comfortable enough to say I think [service- learning] is worth academic credit. That doesn't mean that we haven't done service before this, but it's been through extracurricular clubs...where there is no academic credit and I would not want to take that away from the environment at all, it is very important. To actually set up a formal course and give academic credit, it's got to be more than just doing the service. And so it takes a while to say, Okay, I feel comfortable with this now and I think that it works.

Best Practices for Service-Learning for Experiential Education

The use of criteria for best practices to establish a common educational experience raises service learning to a level of academic rigor that can be fully appreciated by faculty across the institution. Through implementation of these criteria the triad approach to teaching and learning is emphasized in practice and a scaffold approach to student learning is realized. A scaffold approach here is used to describe the process of building competencies as the students progress through the courses in the minor toward the capstone project. A best practice for service learning in the classroom (Table 2) was developed through analysis of interview transcripts and observational field notes.

Faculty also spoke to the specifics of designing a curriculum that includes a service-learning component. In particular, they cited three critical considerations: 1) the number of hours students must spend outside the classroom at the community-partner location, 2) the limited number of students that can be managed per semester in the field, and 3) help for students to make meaningful connections between the service learning and academic content. In terms of that third consideration, a faculty member stated that students "get the meat of what

Table 2
Best Practices for Service Learning in the Classroom

1. Introduce Service-Learning
   a. Service-Learning Assignments Embedded in Curriculum
   b. Service-Learning Discussions Embedded in Curriculum
2. Community Partner Liaison: Participation in Course Planning
3. Student-Community Partner Relationship Building
   a. In-Class Introductions/Guest Speakers
   b. Field Trips to Community Partner Locations
4. Learning Contracts: Student-Community Partner Locations
5. In-Class Discussion Groups: Reflection & Dialogue
6. Written Critical Reflections: Connecting Course Concepts to Experience
7. Evaluation: Community Partner Evaluates Student Performance
   a. Course Grade Associated with Performance
8. Capstone Project or Undergraduate Research
   a. High Impact Practices
   b. Connect to Institutional Practice
   c. Participation Builds Toward Project or Outcome

we teach in the class...we're kind of the toolbox...open it up... [they] explore by going out to their service-learning site. That's really for some students the most valuable experience at [institution]." The best practices for service learning in the classroom are established as a planning tool whereby the triad approach to teaching and learning—experiential, interdisciplinary and community-engaged—are both recognized and implemented through a high impact practice. Service learning, incorporated into individual courses and larger programs such as minors and majors, should be a priority in higher education to achieve student learning outcomes and connect campus to community.

Although service learning is a potentially powerful teaching tool, faculty faced a number of challenges in implementing that component in their classes. These challenges include keeping students engaged in the process, identifying and incorporating "good" community partners in the experience, and enlisting the participation of collaborating faculty. Chris, for example, had this to say about facilitating service learning: "[You take] baby steps...no need to make yourself crazy..." Humor is connected also with the challenges. Nonetheless, faculty accepted the challenges of including a service-learning component since it afforded important learning and, in some cases, professional benefits.

Discussion & Conclusion

Reflection is a core component in best practices found in this study for creating an effective service-learning curriculum. Kolb (1984) views the process of reflection as the process of learning from experience after the learner first engages in an experience (actual or simulated) and then reflects on that experience and forms an abstract conceptualization of it. In the final stage of the process, the learner engages in an experimental activity that tests the learned concept. Reflection is seen as an essential part of the experiential learning cycle. The concept of reflection was later emphasized by Schon (1987), who differentiated between reflection in action (reflection and action occur simultaneously), and reflection on action (when the learner reflects on the experience after the fact). Schon's assertion that reflection occurs both in action and after has implications for practitioners and researchers of experiential learning. For practitioners of experiential learning, the practice of incorporating reflection in curriculum design—either through discussion, written assignments such as journals and critical reflection responses, creative multimedia sources such as blogs, websites, or e-portfolios—is of importance whether facilitating informal experiences in the field or in a formalized classroom environment.

The transformative potential of experiential learning is also a consideration when facilitating educational experiences. Critical reflection, which surpasses the view of reflection in and on action, has been suggested as the pathway to transformative learning (Brookfield, 1987; Mezirow, 1991; Schon, 1987). Understanding that critical reflection is necessary for connecting experience to knowledge in a meaningful manner will go far in reinforcing the educational experience. Brookfield described three stages in the process of critical reflection: 1) identifying the assumptions of the learner, 2) creating

a critical view of assumptions and their relationship to learner's experience, and 3) reorganizing assumptions to make them integrative of experience. Learners, through their desire to search for meaning in experience, will subject their beliefs to the transformative potential of critical reflection in the progress of self-development (Fenwick, 2003).

Within the framework of this study, service learning was viewed as an experiential and community engaged approach to facilitating an interdisciplinary minor. Incorporation of a service-learning component in courses that aim to bridge theory with practice and incorporate an experiential, interdisciplinary, and community-engaged curriculum, insofar as this program, appeared to be evolving. Common standards for an effective service-learning curriculum can be addressed through implementing the best practices for service learning in the classroom (Table 2). Furthermore, establishing course practices and assignments that focus on connecting the course content to student experiences and expanding the concepts to include complex world issues relevant to the community spaces students are learning within create opportunity for critical reflection. Critical reflection and intensive writing are practices to identify needs and create comprehensive capstone projects at the end of the service-learning experience where the student works with the community partner to create lasting artifacts and relationships. Through service learning, as practiced in this program, faculty strived to include a reciprocal process, beneficial to the student, community, faculty, and institution. For faculty looking to include service learning as a practice in their programs, service learning should be clearly defined for the faculty, students and community partners involved. Training on facilitation should be offered to faculty teaching in programs that are designed with service learning as core to the curricula to ensure a common understanding of service learning and incorporation of the triad approach.

A way to enhance service learning in a course is to incorporate the community partner into the teaching team as a co-educator in the process. This incorporation was shown to be instrumental in achieving student learning outcomes in the core courses of the program. The literature is currently lacking in studies that target community partners who are engaged in service learning as community educators and who facilitate the student experience in the field. Thus, a suggested avenue for future research would be to investigate the roles and outcomes of a community partner as a co-educator.

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Adjunct Professors' Perception of Their Teaching Effectiveness

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This study examines the extent to which adjunct professors (a) perceived that they have applied six effective teaching principles (Ramsden, 2003), and (b) perceived that they have been educationally prepared to implement such principles. A purposeful sampling of adjunct professors was conducted. Relationships between whether or not the respondents had a professional teaching degree (bachelor's, master's, or doctoral degree in education) and dependent variables (a) and (b) were addressed. Adjunct professors holding professional teaching degrees perceived that they implemented effective teaching principles to a statistically significantly greater extent than did their non-professional teaching degreed counterparts. Adjunct professors holding professional teaching degrees also perceived that they were better educationally prepared to implement effective teaching principles than were their peers without such degrees.

This study found that adjunct professors' perceived ability to implement effective principles of teaching varies widely between groups and is most closely associated with their holding a professional teaching degree. The old sink or swim method of identifying those successful professionals from business or sciences to be used as knowledgeable professors in higher education can leave a lot to be desired in the classroom. Identified in this study were findings that indicated being knowledgeable, or even highly proficient, in your field does not reflect an understanding of what effective teaching practices are or how to use them in the classroom. Certainly, it would seem a large number of men and women who have obtained a wealth of knowledge in specialized professions throughout their working careers, and then make themselves available for institutions of higher learning to employ, can adapt to the needs of the classroom and become excellent instructors and professors. This study found that, for many without a professional teaching degree (PTD), this is not the case.

This study examines the extent to which adjunct professors (a) perceived that they have applied six specific effective teaching principles as identified by Dr. Paul Ramsden (2003) and (b) perceived that they have been educationally prepared to implement educational principles in the classrooms. A purposeful sampling of adjunct professors was conducted by the author in 2016 to determine relationships between whether or not the respondents had a professional teaching degree (bachelor's, master's, or doctoral degree in education) and dependent variables regarding whether the queried adjuncts in this study know or understand effective teaching principles to assist in their teaching. It also examined how prepared they perceived their education, in whatever field, prepared them to become educators, specifically in their fields of expertise.

In particular, the study compared the differences in use of Ramsden's (2003) effective teaching practices (ETP) by those adjunct professors with professional teaching degrees (PTDs) and those adjunct professors who do not have such degrees. The study findings reported that adjunct professors holding professional teaching degrees perceived that they implemented effective teaching principles to a statistically significantly greater extent than did their non-professional teaching degreed counterparts. Adjunct professors holding professional teaching degrees also perceived that they were better educationally prepared to implement effective teaching principles than were their peers without such degrees. There were six independent variables included in the analysis of relationships: a) the adjunct professor's years of experience as an adjunct professor; b) grade level taught at the college or university, graduate or undergraduate; c) participants' gender; d) participants' age; (e) participation in professional development training; and f) whether the adjunct professor has attained a professional teaching degree or not. This last variable is the one of primary interest. In order to achieve the aim of this paper, a detailed background on ETP will be presented first. Next, the methodology will be presented and quantitative analyses conducted. Finally, the results and their implications will be discussed.

Adjunct faculty employment by institutions of higher education (IHE) has become the most pervasive change in higher education today. Few institutions advise students when using adjunct professors, which can have less than expected result depending on the adjunct's use of ETP. Although having full-time professors does not ensure ETP will be used, the full-time professor will usually have presented many more classes than a part time professor and will present a more dependable level of instruction than many part-time instructors with or without a PTD.

IHE, through necessity, will continue to use a high number of part time instructors. Currently over 68% of professors teaching college or university students are adjunct faculty instead of full-time faculty. That is not who most students, or parents, assume populate the

Table 1
Six Effective Teaching Principles and Their Properties

1. Principle 1: Concern and respect for students and student learning and its properties:
   a. Don't over control activities – Be normal.
   b. Instill confidence in student learning by allowing curriculum to flow.

2. Principle 2: Appropriae assessment and feedback and its properties
   a. Prepare a quality class syllabus and explain it to the class.
   b. Use firm fairness as an instructional technique
   c. Look for and applaud course internalization

3. Principle 3: Independence, control and engagement and its properties:
   a. Appreciate students' levels of understanding.
   b. Allow students to learn at their own pace.
   c. Accommodate students' differences in learning abilities.

4. Principle 4: Concern and respect for students and student learn and its properties:
   a. Don't over control activities, be normal.
   b. Instill confidence in student learning.
   c. Allow curriculum to flow.

5. Principle 5: Appropriate assessment and feedback and its properties:
   a. Prepare a quality class syllabus and explain it to the class.
   b. Use firm fairness as an instructional technique.
   c. Look for and applaud course internalization.

6. Clear goals and intellectual challenge and its properties
   a. Establish learner-centered instruction.
   b. Set clear goals with clear intellectual standards.
   c. Prepare students to attain high standards

United States IHE faculty populations. Because fiscal realities require IHE to cut teaching costs to minimum levels, adjunct professors are likely to be standing at the front of a classroom rather than full time professors. Does this mean the students are being short changed in their education or that degrees are being issued to students ill-prepared to enter the work force and succeed? The answer to that is heavily aligned with the skill and professionalism of the individual adjunct, his or her understanding of professional educational practices, and his or her appreciation of the effective teaching practices required to make learners out of students.

Effective Teaching Principles (ETP) - Ramsden (2003)

The effective teaching principles that are used to inform this study were designed by Ramsden (2003) to be helpful in training professors, including adjunct professors, who lack PTDs as instructors in higher education. The effective teaching principles are: 1) interest and explanation; 2) concern and respect for students and student learning; 3) appropriate assessment and feedback; 4) clear goals and intelligent challenge, 5) independence, control and engagement; and 6) learning from students (See Table 1). These principles are further

broken down into properties of good teaching that then begin to allow discussion on how they are inter-related to each other and to the holistic constructivist theories and properties of transformational learning, andragogy, self-learning, and critical thinking.

The absence of formal teacher training, or not having received a professional teaching degree, does not remove the responsibility from adjunct professors to understand their curriculum or their students' individual learning needs when presenting course instruction (Brookfield, 2013; Illeris, 2014; Knowles, 1988; Ramsden, 2003, 2011; Weimer, 2013). Pratt and Associates (2002) observe that higher education instructors have a responsibility to learn teaching techniques and principles that meet the needs of their students.

Taylor and Cranston (2012) and Illeris (2014) write that while it is not within a researcher's power to give higher education instructors step-by-step guidance on how to teach, there are "core elements" (p. 8) to teaching that should be integrated into ETP. Taylor and Cranston's (2012) recommended that core elements are the following: individual experiences of the instructor that frame an instructor's approach to teaching; critical reflection into the course content and the process that it was presented to each class; a holistic orientation to the

emotional and social dimensions of student needs to reduce argumentation and increase critical reflection and cognition; awareness of the context of course material in relation to students' perception of their need for the material and any personal or sociocultural conditions involved; and finally, a creation of an authentic relationship between students and the instructor.

Ramsden's writings agree with core elements delineated by Taylor and Cranston (2012). These elements have assisted Ramsden in developing the six effective teaching principles for higher education adjunct professors that inform this study. Ramsden suggests the six effective teaching principles are meant to be starting points from which each instructor can "understand and articulate clearly what is and what is not useful" (p. 87), and he suggests that higher education instructors be given teaching tools to start their understanding of teaching styles and learner needs that were not presented to them in their own college programs. What is the goal? Together with the instructor's course content experience, these six principles can build instructors' knowledge and confidence to become better learner-centered instructors.

New or seasoned adjunct professors can individually learn from Ramsden's ETP, or the principles can become the subject of professional development programs for new and seasoned adjunct professors. With modern technology being used so abundantly in education, ETP of many styles avail themselves to become a pre-teaching learning program for adjunct professors (Santos, 2012). Indeed, the results of adjunct professor pre-instruction training, using principles comparable to Ramsden's, have been found to be significant for instructor and non-traditional learner efficacy during classroom instruction (Musaitif, 2013; Santos, 2012). Student achievement was seen to have improved when results from adjunct professors with pre-instruction training were compared to instructor control groups not given instructor pre-instruction training (Borjarczyk, 2008; Santos, 2012).

Background

The desire to understand and improve adult education has increased since Lindeman (as cited in Knowles, 1980) first identified differences in how children and adults learn. The six principles as identified by Ramsden underscore the comprehensive and humanistic nature of learning. In higher education these principles have prompted research into brain activity, cognition, and student and teacher motivation (Glickman, Gordon, & Ross-Gordon, 2010) that contribute to the understanding of the special requirements that exist for adult learner needs. The area that has received only a modicum of attention and research is that of effective teaching principles to be used in adult higher education classrooms (Weimer, 2013).

Although many adjunct professors are content knowledge experts in their fields, they often lack training in, or have no familiarity with, effective teaching principles (Kezar & Maxey, 2012). Adjunct professors who perceive that they are not familiar with ETP may lack the skills to overcome student or institutional obstacles that impede their ability to understand student learning needs in their classrooms (Ramsden, 2003). Harris and Cullen (2010) conclude that even though important research has been conducted into these issues with full-time college and university professors, little research has been done with adjunct professors.

This area of research brings about an increased level of importance when applied to the adjunct professor population that is increasing in universities and colleges throughout Pennsylvania. The increased personnel budgeting constraints do not always allow faculty to be positioned as, and where, a university or college may desire (Santos, 2012). The result is the increased use of adjunct professors in undergraduate and adult classes (Kezar & Maxey, 2012). Adjunct professors' content experience and expertise (Concordia, 2014) are utilized on a class-by-class basis where teaching does not require a full-time instructor with full pay and benefits but does require a content knowledge instructor. The question becomes the issue of the adjunct professor knowing, or understanding, theories and principles with which to teach university and college students (Brookfield, 2013).

Little research has been done into the perceived use of ETP by adjunct professors with or without professional teaching degrees in university and college classrooms (Weimer, 2013). Consequently, this study offers a significant contribution to the literature, because it identifies whether a purposefully selected population of Pennsylvania adjunct professors, with and without professional teaching degrees, perceive that they (a) apply effective teaching principles and (b) have been prepared to apply these principles.

Mitigating Factors

The employment of adjunct professors is on the rise in Pennsylvania IHE (Linda Hayden, personal communication, September 20, 2013). In response to the increased cost of education and institutional budgetary constraints, Pennsylvania IHE will continue the hiring of part-time adjunct professors to fill classroom teaching needs. Higher education does not require teaching certification from these adjunct professors (Santos, 2012), thus leaving the quality of instruction up to each instructor (Musaitif, 2013). Ramsden (2993), Bain (2004), Weimer (2013), Brookfield (2013), and Illeris (2014) have reservations about the quality of the instruction in classrooms where ETP are not being used. Ramsden has indicated that

the use of the six ETP developed for higher education adjunct professors can be presented in professional development training to make adjunct professors more proficient and professional.

The use of the effective teaching principles is only as good as the adjunct professors' or institutions' application of those principles (Ramsden, 2003; Weimer, 2013). No single principle will fulfill all of the needs for all adjunct professors; however, through adjunct professors' use of researchers' findings about principles for teaching, world-community higher education requirements can be met (Ramsden, 2011). Instructor motivation to learn new ETP, feelings of inclusion into the faculties where they teach, office space for their use, a lack of teaching theory and learner needs, and a lack of proficiency in the use of college and university technology are all factors that impact adjunct professors' application of ETP (Komos, 2011; Merriam & Brockett, 2007). Factors such as these can be overcome with effectively planned and presented professional development training.

A more difficult factor to overcome is resistance from members of the faculty who battle or attack new procedures and principles (Bain, 2012). Adjunct professors with previously constructed course syllabi or lesson plans can tend to resist new principles that they perceive as ineffective as or at least no more effective than what they are already using (Bain, 2004). Until they can be convinced evidence-based teaching principles and strategies can be effective in their style of teaching, change is unlikely to occur (Brookfield, 2013).

Adjunct Faculty Perceptions of Their Personal Training in Pedagogy

Several studies whose methodologies are perception-based, as is this study, have produced correlations between workers', teachers', administrators', and students' perceptions of their performance and their actual performance as self-evaluated, peer-evaluated, or supervisor-evaluated (Kezar & Maxey, 2012). As this study requested self-reported perceptions from adjunct professors, this information is relevant. Mabe and West (1982) found that self-evaluations of workers' performance were positively correlated with actual workplace performance as assessed by their peers. This correlation is highest when the self-evaluators are intelligent and invested in the organization where they work as the participants in this study are invested with their teaching and the perceived use of ETP (Mabe & West, 1982). John and Robins (1994) found that self-perceptions in the workplace demonstrate convergent validity when compared with actual work performed as assessed by staff developed criteria. The self-evaluations were only slightly more positive than peer evaluations (John & Robins, 1994).

Many adjunct professors without PTDs perceive that their teaching skills are less than complete because "Most university faculty members hardly received any training in teaching skills because their universities in the past did not pay special attention to assisting them to teach better" (Chang, Lin, & Song, 2011). Moore (as cited in Lyons, 1999) related that adjunct professors perceive their acceptance as faculty is lacking in most IHE while Gappa and Leslie (1993) argued that their academic backgrounds in their specific fields prepared them for the content knowledge in the subject IHE hired them to teach, but not specifically for instruction using ETP. Santos (2012) found that the adjunct professors she hired for her university Teacher Professional Development courses were well versed in technology, budgeting, leadership, and other subjects that they were hired to teach, but not well versed in the ETP she had expected they would know. She found that many non-PTD holding adjunct professors' perceptions of their teaching abilities did not match their classroom performances (Santos, 2012)

Cox, McIntosh, Reason, and Terenzini (2011) found that in the schools and faculty they studied "there appears no clear pattern indicating a relationship between institutional policy and faculty perceptions" (p. 819) of what good teaching practices contain. IHE policies about "[Cultures of teaching] were more prevalent at institutions with [learner-centered] policies" (Cox et al., 2011, p. 819), but faculty actual practices of "old and comfortable" (p. 820) classroom procedures over-rode policies in many cases. To wit, where IHE report they prefer and advocate learner-centered teaching practices, Fletcher, Djajalaksana, and Eison (2012) found that part-time faculty continue to use "lecture (48%), whole-group discussion (17%) and group questioning (23%) as their three most frequently employed methods of instruction" (p.78). While these teaching strategies can be effective forms of instruction and learning, Fletcher et al. (2012) asserted that, regardless of IHE policies adjunct professors feel [perceive] they know their preferred teaching styles and "seem to rely more on traditional approaches in teaching their classes" (p. 79).

Mullens (2001) found that adjunct professors display differing levels of instructional competence and their perceptions of their own abilities. When instructing within their content knowledge areas, instructor efficacy and quality in subject matter use is high. At the same time adjunct professors' pedagogical skills are very high in some classes and less than marginal in others (Mullens, 2011). Chang et al. (2011) noted that "students are most satisfied with what teachers [adjunct professors] teach, while least satisfied with how they teach" (p.53). Santos (2012) pointed out that this disparity, between the teaching ability stated by adjunct professors and the student satisfaction with subject

matter taught in their classes and how the instruction was delivered, is what prompted her to develop a pedagogy professional development program for adjunct professors that were hired to instruct in her IHE.

Relationships Between Adjunct Faculty Perceptions and Adjunct Faculty Performance

Assessing adjunct professor performance is difficult because most IHE only use student reported evaluations for part-time instructors (Gappa & Leslie, 1993; Kezar & Maxey, 2012). Kezar and Sam (2010) found that many IHE have no developed evaluation system for adjunct professors. Cox et. al. (2014) explained that IHE are encouraging a shift from teacher-centered to learner-centered pedagogies, although some full-time faculties are resistant to that shift. Kezar and Sam (2010) found that "many non-tenure-track [part-time] faculty consider themselves as professionals with in-depth training and are socialized to academia" (p. 65) and resist pedagogical changes even when IHE change policies. Cox et al., (2011) indicated that if IHE desire a change from pedagogies such as lecture, they are compelled to reeducate their faculties to a new culture of pedagogy incorporating learner-centered activities and abandoning a reliance on teacher-centered strategies.

Santos (2012) reported that a number of the non-PTD trained adjunct professors she had hired reported that they were confident that they could adequately teach subjects in their content knowledge areas; however, they did not know about ETP. She found that their perceptions were misguided. Until she initiated a pedagogy relevant professional development training program, student achievement resulted in both student and administrative frustration and higher than anticipated student drop-out rates from her program (Santos, 2012). Studies of adjunct professors have indicated that they believe that they provide quality education to students and a quality service to the IHE where they teach (Kezar & Sam, 2010).

Brookfield (2013) observed that higher education teachers who do not use or understand ETP "turn learning spaces into dead zones of mind-numbing busy-work, in that people's creativity is exercised for the sole purpose of finding new ways to manage the boredom" (p. 5). Bishoff (2010) wrote that when students are taught, not as individuals, but in a "one-size-fits-all" (p. 7) manner, instructors are mostly ineffective and often lose their ability to instruct effectively. Ramsden (2003, 2011), developer of six effective teaching principles that inform this study, concurred with Bishoff (2010) in his first principle, interest and concern for students, by stating that instructors need to begin the process of learning methods to entice students to accept the responsibility for becoming learners.

ETP are now available and have become a pivotal portion of improving classroom results (Bain, 2012). However, delivering effective instruction to fulfill student's learning needs does not always come naturally to instructors (Brookfield, 2013). Teaching principles emphasize adapting to learning principles to help students internalize and learn course material (Weimer, 2013). Professors are more effective when they understand that effective learning occurs when the student is made responsible for assimilating the information presented by the professor (Bain, 2012) and "delivering that instruction takes experience and training" (p. 15).

Professors trained in ETP are able to decide what principles are the most appropriate for their fields of study and the most effective for their student populations learning success (Ramsden, 2011). Teachers should "expect students to change their interpretation of the world where they live through developing their understanding of the subjects they have studied" (Ramsden, 2003, p. 39). The responsibility for fulfilling that expectation places instructors in a position where they need to know student learning styles and adapt ETP into their classes to meet those needs (Ramsden, 2003).

Classroom focus has shifted toward learner achievement and away from instructor superiority (Weimer, 2013). Ramsden (2003) noted that the problem for many instructors is that their undergraduate students are unable to understand how and when they are meeting class directions and requirements in order to learn the course material. Part-time instructors may be unsure what ETP are or when to use them to remedy that problem (Kezar & Maxey, 2012).

Method

The primary aim of this study was to examine the relationships between adjunct faculty members' perceptions of (a) their implementation of ETP and (b) their educational preparedness to implement ETP and whether or not they possess a PTD.

On-line electronic sampling was conducted using a researcher-designed electronic survey instrument, and SurveyMonkey software facilitated the survey's distribution. All collected data were self-reported.

Pilot testing of the researcher-designed survey was conducted with randomly selected volunteer Neumann University adjunct professors. Following pilot testing the internal validity of the survey instrument was assessed using both Cronbach's alpha and respondent feedback. The Cronbach's alpha was calculated to be 0.94, indicating a very high level of internal validity of the survey.

The main body of the survey instrument utilized a Likert-scale survey instrument, in compliance with Vogt et al. (2012) Likert-scale survey development recommendations, with ETP questions familiar to the

Table 2
*Adjunct Professor Participant (APP) Means, t-values for Differences
between Means, and p-values for Independent Variables A-H.*

	Mean (proportion for categorical variables)	t-Value	p-Value
1. App by Professional Teaching Degree (PTD):			
APP with PTD	.50		
APP w/o PTD	.50		
a. Implementation of ETP by PTD:		2.45	0.0175
APP with PTD	4.22		
APP w/o PTD	3.97		
b. Educational Prep. to implement ETP:		3.03	0.0036
APP with PTD	3.74		
APP w/o PTD	3.38		
2. APP by Grade Levels Taught:			
Undergrad with PTD	.51		
Undergrad w/o PTD	.49		
Graduate with PTD	.52		
Graduate w/o PTD	.48		
3. APP by Gender:			
Male	.50		
Femail	.50		
4. APP by Age:			
25-35	.08		
36-45	.12		
46-54	.30		
55+	.50		
5. App by Years of IHE Teaching Experience:			
1-5 Years	.27		
6-10 Years	.28		
11-15 Years	.15		
16+	.30		
6. APP with Professional Development ETP Training:			
Yes	.38		
No	.33		
Unsure	.28		

participants. Each survey instrument question dealing with perceived implementation of ETP contained a five-choice Likert-scale option where choice one was "Hardly Ever", choice two equaled "Occasionally", choice three was "Sometimes", choice four equaled "Frequently", and choice five equaled "Almost always" (Johns, 2010; Vogt et al., 2012).

The survey instrument asked each respondent to estimate the extent to which they perceived that they engage in the use of ETP when preparing to teach higher education students. Similarly, the respondents were asked to estimate the extent to which they perceive that their educational backgrounds prepared them to engage in such teaching behaviors. This was done using forty questions, each of was consisted of two parts (one part addressing implementation of ETP, the other addressing educational preparation to implement ETP). Each question was carefully mapped to address one of Ramsden's (2003) six principles. Respondents were also asked several demographic questions. Additionally, nine distractor questions (that were not relevant to the study) were included in the survey instrument to disrupt the development of predetermined participant response sets to the survey questions (McNeil, Newman, & Steinhauser, 2005; Villafane-Garcia, 2015).

All survey participants were randomly selected by AdjunctNation.com prior to sending participation recruitment emails to two thousand adjunct professors who had identified themselves to Adjunct Nation, Inc., as working or residing in the five counties surrounding, and including, Philadelphia County in Southeastern Pennsylvania. The adjunct professor participants were supplied with a link to the study survey instrument on SurveyMonkey.com when they received their email.

The following hypotheses stem from the work of Ramsden (2003) and were addressed using the previously discussed survey:

Hypothesis 1:
H_0: Adjunct faculty who hold a PTD will perceive that they implement PTD to the same extent as those adjuncts without a PTD.
H_1: Adjunct faculty who hold a PTD will perceive that they implement PTD to a greater extent those adjuncts without a PTD.

Hypothesis 2:
H_0: Adjunct faculty who hold a PTD will perceive that their educational preparedness to implement ETP is the same as those adjuncts without a PTD.
H_1: Adjunct faculty who hold a PTD will perceive that they are more educationally prepared to implement than those adjuncts without a PTD.

Several steps were taken in order to address the aforementioned hypotheses. First, descriptive statistics were calculated for the relevant variables. Next, two t-tests were performed, one for each hypothesis, in order to assess the similarity of the two groups (those with a PTD and those without a PTD). Finally, two multiple linear regressions were performed (one for each hypothesis). In the first case, the dependent variable used was perceived level of implementation of ETP. In the second case, the dependent variable used was perceived educational preparedness to implement ETP. In each regression, the (binary) independent variable of interest was whether or not the respondent held a PTD. Additionally, the demographic variables discussed in the introduction were included in order to (a) control for any potential effects they might have, and (b) examine their relationships with the dependent variables. These analyses will now be presented in detail.

Data Analysis and Results

First, descriptive statistics were calculated for the variables of interest. In particular, the mean levels of (a) perceived implementation of ETP and (b) perceived educational preparedness to implement ETP were calculated. These means were calculated for each group of respondents: those with a PTD, those without a PTD,

males, females, etc… This information is presented in Table 2. Recall that both the implementation of, and preparedness to implement, ETP were measured on a 5-point Likert-type scale. The most noteworthy aspect of these data is that both the sample mean perceived implementation and the sample mean perceived educational preparedness of the respondents with a PTD are quite a bit higher than the corresponding sample means in the group without a PTD.

In order to assess the significance, if any, of the differences above, two t-tests were conducted (t-tests for independent samples with equal variances were determined to be appropriate). The mean difference in perceived implementation (between those with a PTD and those without a PTD) was found to be 0.25. The p-value of the corresponding t-test was found to be 0.0175. Thus, the null hypothesis of no difference between the groups was rejected (at the 0.05 level). Similarly, the mean difference in perceived educational preparedness was found to be 0.36, with a corresponding p-value of 0.0036. Again, the null hypothesis of no difference between the groups was rejected.

The statistically significant differences discussed above were further investigated, in order to assess their effect sizes and, hence, practical significances. The mean difference in perceived implementation was found to be 6.3%. This implies that those respondents with a PTD perceive their level of implementation of ETP to be 6.3% higher than do their peers without a PTD. Similarly, the mean difference in perceived educational preparedness was found to be 10.7%, meaning that those respondents with a PTD perceive their level of educational preparedness to be 10.7% higher than do their colleagues without a PTD.

The final step of the analysis was to conduct two multiple linear regressions as discussed in the methodology. The results of these regressions are presented in Tables 3 and 4. It must be noted that each regression was thoroughly examined in order to assure that the underlying statistical assumptions of regression were met. The most noteworthy findings were that the only variable that appeared to be significantly related to either perceived implementation of ETP or perceived educational preparedness was the possession of a PTD. None of the other variables (gender, age, level of courses taught, participation in professional development, years of experience) exhibited a significant relationship with either perceived implementation or perceived preparedness.

The coefficient of PTD in the first regression implies that, when all other variables are held constant, those with a PTD perceive their level of implementation of ETP to be 0.238 higher than those without a PTD. Similarly, in the second regression, it was found that, holding all other variables constant, those with a PTD perceive their level of educational preparedness to be

Table 3
Regression Results. Dependent Variable: Implementation of ETP

Variable	Coefficient	t-value	p-value
Constant	3.967	22.99	0.000
PTD	0.238	2.212	0.031*
Level Taught	-0.009	-0.069	0.950
Prof Develop	0.125	0.959	0.342
Gender	-0.044	-0.389	0.699
Age	-0.113	-1.037	0.305
Years of Teaching in IHE	0.035	0.0305	0.762

Note: * Indicates statistically significant at 0.05 level.

Table 4
Regression Results. Dependent Variable: Educational Preparation

Variable	Coefficient	t-value	p-value
Constant	3.034	7.819	0.000
PTD	0.745	3.077	0.003*
Level Taught	0.091	1.275	0.784
Prof Develop	-0.170	-0.579	0.565
Gender	0.423	1.730	0.090
Age	-0.287	-1.137	0.261
Years of Teaching in IHE	0.044	0.169	0.867

Note: * Indicates statistically significant at 0.05 level.

0.745 higher than their peers without a PTD. These results will be further discussed and put in context in the following section.

Limitations

Several limitations to this study exist. First, the data were collected solely from the five-county region surrounding Philadelphia, Pennsylvania. A survey from a broader geographical region might provide richer data. Second, the data deal with perceptions of implementation of ETP and not frequency of use of ETP. While it would be very difficult to collect said data, it would be most interesting if data on the frequency of implementation (perhaps in times per hour) were available. Finally, it should be noted that not all faculty who received the questionnaire filled it out. While there is no reason to believe so, if a difference exists between faculty who chose to fill out the questionnaire and those who chose not to, then the results of the study might not be as representative of the population as hoped.

Discussion and Conclusions

Recall that the aim of this study was to examine the factors related to adjunct professors' perceptions regarding their implementation of effective teaching principles (ETP) and their educational preparedness to

do so. Foremost among those factors was whether or not the adjuncts held a professional teaching degree (PTD). As was shown in the preceding analysis, it was found that adjunct professors who held a PTD perceived that they implemented ETP to a greater extent and were more educationally prepared to do so. None of the other variables, not even participation in faculty development training, appeared to be related to perceived implementation of ETP or perceived educational preparation to do so.

These findings imply that there is, indeed, value in adjunct professors earning degrees in education, as those adjuncts who held such a degree perceived their implementation of ETP to be higher than their peers. According to scholars (Ramsden 2003; Weimer 2013), the implementation of such principles is of great value to adult learners. Indeed, Bain (2012) asserts that the usage of such principles is directly related to student achievement.

An even larger difference existed between those with a PTD and those without a PTD regarding their perceived educational preparedness to implement ETP. This should not be surprising since those with a PTD presumably received dedicated training in such principles. This perceived preparedness should allow adjuncts with a PTD to feel more confident in their ability to disseminate information to students in an effective manner.

Just as interesting as the preceding results is the fact that none of the other variables examined were

found to be related to perceived implementation of ETP or perceived educational preparedness to do so. For some of the variables – gender, for instance – this lack of relationship is probably not surprising. For other variables, most notably years of experience and participation in professional development training, this lack of relationship may appear counterintuitive.

Combining the preceding findings with the work of Santos (2012), it appears that two suggestions may be made to increase the usage of ETP. First, individuals with an intention to teach at an IHE should be encouraged to pursue a degree in education at the earliest stage possible, or, if that is not possible, to take formal classes in pedagogy along with their content area coursework.

In the case of adjunct professors, in particular, the preceding suggestion may not be realistic in many situations. This is because many of them serve as practitioners in their area of expertise for years, prior to beginning a career in academia. In these situations, the findings contained herein suggest that these adjunct professors participate in "specialized" faculty development. Note the emphasis on the word "specialized." As was found, typical faculty development training does not appear to be associated with increased perceptions of implementation of EPT. The type of training suggested by the preceding findings would be as similar as possible to the classroom training of educators. Such a suggestion should not be difficult for most IHE to implement. Indeed, faculty development training sessions led by education faculty that mimic in-class content may prove to provide adjunct professors with some of the same skills that they would have acquired by pursuing a formal degree in education. Such training would, most likely, have to be ongoing, as the educational training received while earning a degree in education is, clearly, broader and deeper in scope than that which could be presented during a day or two of faculty development training.

The findings contained in this paper lead to several areas for future research. First, a similar study, utilizing respondents from a broader geographical area, perhaps international, would be of great interest. This could potentially allow the results contained herein to be extended to a larger population. Second, it would be worthwhile to perform achievement testing on students who were taught by adjunct professors with a PTD and also without a PTD. This would allow the results of this paper to be tied more closely to the work done by Bain (2012). Finally, it would be most interesting to compare the implementation of ETP by faculty holding a PTD with faculty who received the type of faculty development training suggested in the preceding paragraph. This would allow for a direct test of the hypothesis that such faculty development training is valuable.

In summary, it has been found that there is significant value in adjunct professors holding a PTD. Such faculty members perceive that they both implement ETP more frequently and are more educationally prepared to do so than their peers who do not hold such degrees.

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Exploring First Year Undergraduate Students' Conceptualizations of Critical Thinking Skills

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The development of critical thinking skills forms an important part of many higher education courses and has become increasingly visible in syllabi and assessment criteria. Yet, in spite of this, students often struggle to understand what it is and to demonstrate it in their work. This paper aims to explore how students understand the term critical thinking and to identify some of the key factors which influence this. An in-depth case study was conducted with four first-year undergraduate students in the education faculty of a university in England. Data were collected through thematic interviews and stimulated recall interviews. Key findings highlight that students believe strongly in the importance of developing critical thinking skills, yet while they can speak relatively easily about more abstract definitions of the term, they often find it difficult to do and to identify in their own work. Findings suggest that their conceptualizations are influenced by their prior educational experiences and vary according to discipline. Implications for pedagogy include the need for explicit guidance on critical thinking, the provision of substantial opportunities for practice, and the need to engage in dialogue across disciplines to highlight opportunities for promoting connection-making and transfer between different contexts.

Across the Western world educators, policymakers, and employers have demonstrated a sustained interest in teaching critical thinking as both an important life skill and an asset to the future workforce (Huber & Kuncel, 2016; Ku, 2009). In the UK, critical thinking has been identified as a key area to be cultivated and assessed in higher education institutions (HEQC, 1996). As such, it has become a central tenet of tertiary level education and often forms an explicit part of courses and assessment criteria across a wide range of disciplines. Yet, in spite of the emphasis placed on the importance of developing critical thinking skills both within and beyond the university system, students often struggle to understand what it is and to demonstrate it in their work (Duro, Elander, Maratos, Stupple, & Aubeeluck, 2013). The aim of this paper, therefore, is to explore how students conceptualize critical thinking with a view to developing pedagogical strategies to better support them.

Literature Review

In spite of the general recognition of the importance of critical thinking, as outlined above, there remains widespread disagreement about what it actually is (Mulnix, 2012). The aim of this section is to firstly provide an overview of some of the key perspectives on critical thinking, with reference to philosophers of education such as Robert Ennis, Richard Paul, and John McPeck, in order to establish a working definition for the purpose of this paper. Critical thinking will then be considered from a student perspective, and some key factors which may influence students' ability to become critical thinkers will be examined.

Philosophical Perspectives on Critical Thinking

Critical thinking is generally considered to be a form of higher order thinking and, as such, is distinct from forms of lower order thinking such as recall and direct application of knowledge. Yet, as Rudd (2007) highlights, the two are not necessarily synonymous, and even though critical thinking utilizes higher order thinking, it should not be used as a "catch-all" term. However, a universal definition of critical thinking remains elusive and debates center largely around whether or not it constitutes a particular skill, as well as the extent to which it is discipline-specific or transferable between contexts.

Early definitions emphasized critical thinking as a particular skill or set of skills, such as generalizing, reasoning, and evaluating. For the philosopher of education Robert Ennis, emphasis was initially placed on the more cognitive component, and critical thinking for him entailed the "correct assessing of statements" (1962, p. 81). However, this definition became more holistic over the years and was broadened to encompass "reasonable reflective thinking that is focused on deciding what we believe and do" (Ennis, 1987, p. 10). This additional recognition of a dispositional component suggests that, "[B]esides the ability to engage in cognitive skills, a critical thinker must also have a strong intention to recognise the importance of good thinking and have the initiative to seek better judgement" (Ku, 2009, p. 71).

A similar view was held by Paul (1982), who also emphasized the skills associated with critical thinking. In later work with colleagues, he defines it as "the intellectually disciplined process of actively and skilfully conceptualising, applying, analysing, synthesising, and/or evaluating information gathered from, or generated by observation, experience, reflection,

reasoning or communication, as a guide to belief and action" (Scriven & Paul, 2008a). Importantly, the use of the term "intellectually disciplined" here suggests that the authors view critical thinking as a learned skill that can be developed rather than something which is innate. Such a view of critical thinking as a "process" is similarly emphasized by Mulnix (2012). For Paul, critical thinking also requires an in-depth knowledge of oneself and is self-directed, self-disciplined, and self-monitored (Scriven & Paul, 2008b).

However, if critical thinking can be considered as a skill or set of skills, there is still no clear consensus as to whether such skills are generic and can be applied across disciplines or whether they are more closely related to specific subject knowledge (Duro et al., 2013). Both Ennis (1996) and Paul (1982) argue that critical thinking can be learned independently of specific disciplines and transferred between contexts, however with the caveat that the learner must have at least a threshold level of competence in a particular discipline for this to hold true. Yet McPeck (1981) claims that critical thinking is both specific to, and dependent on, a particular discipline, and that in order to be a critical thinker it is necessary to have a thorough knowledge of the content. A similar view is held by Willingham (2007), though this time from a psychological perspective, who in turn suggests that critical thinking is fundamentally intertwined with domain knowledge and, as such, is highly discipline-specific and non-transferable across disciplines.

Yet this implies that a different skill set is required for different disciplines, which does not seem feasible given the widespread emphasis placed on critical thinking across different subject areas and professions. It would seem logical, therefore, that if particular skills of critical thinking are developed in one context, they could be applied to another. This may not happen automatically, however, as suggested by Billing (2007), training in critical thinking can be effective for transfer when abstract principles and rules are coupled with examples.

Given the literature considered above, it would seem that critical thinking, as suggested by Mulnix (2012), should be considered as a process and a skilled activity of thought which includes a commitment to using reason in the formulation of our beliefs and that it can be possessed to a greater or lesser degree. Critical thinking can transcend disciplines and "has little to do with *what* we think, but everything to do with *how we* think" (p. 466).

Understanding Critical Thinking: The Student Perspective

While the literature above considered critical thinking from a more philosophical and theoretical perspective, it is also important to take into account empirical studies which investigate the way in which it is understood and operationalized in the university context. Although there are some empirical studies which focus on conceptualizations of critical thinking among academics or teachers (e.g. Moore, 2013), there has been less focus on the students.

One exception to this which is highly relevant to the current research, is a study conducted by Duro et al. (2013) into the understandings of critical thinking among 26 undergraduate students of psychology at a university in England. Data were collected through focus groups, and the questions asked participants to define critical thinking and to discuss the extent to which they felt they could demonstrate it in their work. It should be noted, however, that this study focused only on the general views of the participants and did not include discussion of concrete examples of students' work. As such, it may not have been possible for the researchers to capture more in-depth and reliable insights into what students actually do.

However, in spite of this, the study was useful in shifting the focus from the teachers to the students, and the findings gave rise to practical implications for promoting critical thinking. Four main themes emerged which were termed by the authors as "vague beginnings," "conceptualizations," "development and transitions," and "learning strategies." Students' understandings of critical thinking were initially very vague in that they believed that it was an intuitive ability that could not be explicitly taught. It was believed to be a transferable skill and one which was highly relevant outside academic life as well. The students described the ways in which their critical thinking developed slowly over time, which is in line with the literature cited above. The participants also referred to the role of social interactions, both with peers and with tutors, in this development. As such, the authors surmised that explicit demonstration, explanation, and provision of opportunities to engage in critical thinking on the part of the tutors were important.

Factors Which Might Influence Critical Thinking

While the above study provided an overview of students' views of critical thinking, it did not consider the complex individual or contextual factors which may have influenced these views. It is also important, therefore, to recognize that students do not come to university as *tabulae rasae* and, as such, we must acknowledge the role of their prior academic experiences.

Given that conceptualizations of critical thinking among academics and theorists differ between disciplines (Moore, 2013; Swanwick et al., 2014), it seems logical that this in turn will influence the students' understanding of, and engagement with, such thinking. As such, it is important to consider that undergraduate students, particularly those in the social

sciences, will often come to the university from a wide range of academic backgrounds. Some students will have focused more heavily on arts and humanities subjects at school and may find themselves working alongside peers who predominantly studied science subjects in the year or two prior to attending the university. This will undoubtedly shape their initial conceptualizations of critical thinking in a new discipline. While, as suggested above, critical thinking is not necessarily discipline-specific, nonetheless it will take time and effort to 'translate' and adapt pre-existing skills accordingly.

Research Questions

An evaluation of the research explored above led to the current qualitative study which explores conceptualizations of critical thinking among first year undergraduate students of education at a university in England. The following research questions were identified:

1. *How do students understand the term 'critical thinking'?* While existing research provides some general characteristics of critical thinking, it is important to fully understand how students within a specific context understand and operationalize this. This is particularly important given the emphasis placed on critical engagement within higher education more broadly.
2. *What are the key factors which influence the way in which students conceptualize critical thinking?* As suggested above, students' conceptualizations of critical thinking may be influenced by a range of individual and contextual factors such as their prior learning experiences and academic backgrounds. It is important to understand how such experiences may both facilitate and hinder their understanding of, and ability to engage with, critical thinking.
3. *What strategies could be used to support students' development of critical thinking skills?* This study ultimately aims to identify some strategies for higher education practitioners which can be used to help students to develop their critical thinking skills.

Method

In order to answer the above research questions, a small-scale case study was conducted to explore first year undergraduate students' conceptualizations of critical thinking. This study is situated within a constructivist paradigm which is considered to be idiographic, subjective, and generally associated with qualitative research. A constructivist view holds that "social properties are constructed through interactions between people rather than having a separate existence. Meaning does not exist in its own right; it is constructed by human beings as they interact and engage in interpretation" (Robson & McCartan, 2016, p. 24). As such, it implies a focus on the individual and the way in which he or she makes sense of the world through his or her experiences, which allows the researcher to gather a complexity of views. The central aim of research from a constructivist perspective is *understanding*, and as such it constitutes an appropriate framework in which to situate the current study. The purpose of this study is not to start with a theory, but instead to "generate or inductively develop a theory or pattern of meaning" (Creswell, 2014, p. 8) from the data.

Research Context

This study was conducted with first-year undergraduate students taking a course on language and literacy in the education faculty of a university in England. The course draws predominantly on theories from sociology and psychology. This is a compulsory course for students of education; however, it is also an optional module for students studying for a degree in psychology, and they normally constitute about 50% of the group. This means that the students come from a wide range of academic backgrounds in terms of subjects they studied at school, ranging from the purely humanities-based to the purely science-based. First year students are also an important focus of research into student learning in higher education given that they are coping with a steep transition from secondary to tertiary level education (Harvey & Drew, 2006).

The assessment criteria for undergraduate students in education places a lot of emphasis on critical engagement, particularly in the higher mark "bands". Interestingly, the word "critical" does not appear in any criteria below an upper second class grade; therefore, it is one of the key features that students are striving to include. At this level, students must show "a capacity to engage critically with arguments and evidence," while to get a first-class grade it is expected that students will answer the question "relevantly and critically" and demonstrate "strong powers of analysis and synthesis in developing arguments."

Research Design: Case Study

The participants of this study were four first year students in the 2016/17 academic year who represent a range of backgrounds and courses (see Table 1). As such, this is a case study which aims to focus on several "instances of a particular phenomenon with a view to providing an in-depth account of events, relationships,

Table 1
Overview of Participants

Pseudonym	University degree course	School subjects studied at advanced level
Denise	Education with English and Drama	Drama, English, Music, Psychology
Lucy	Education with Geography	English literature, Geography, Philosophy, Sociology
Maria	Education with English and Drama	Drama, English, French, Philosophy
Orla	Psychology	Biology, English literature, English language, Psychology

experiences, or processes occurring in that particular instance" (Denscombe, 2010, p. 52). Given the small number of participants the aim of this study is not to generalize, but instead to look closely at *how* they understand critical thinking with a view to discovering how students can be best supported to develop these skills. As such, in line with a case study approach, the aim of this study is "to illuminate the general by looking at the particular" (Denscombe, 2010, p. 53).

Research Method: Interviews

A number of existing studies into critical thinking have taken a more quantitative approach, using multiple choice tests, such as the Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 1980) and the California Critical Thinking Skills Test (Facione, 1990), to assess and measure students' skills. In these tests statements are set within a general context and are designed to be discipline-neutral. However, they have more recently been questioned on the grounds of their construct validity and reliability (Ku, 2009). Also, it could be argued that such a tool does not reveal the complexity of participants' reasons for choosing a particular answer.

As the aim of this study was rather to gain an in-depth understanding of students' conceptualizations of critical thinking, it was considered more appropriate to conduct semi-structured interviews, lasting 20-30 minutes, with each participant. The aim of the interview was primarily to ask the students about how they defined critical thinking and drew on general prompts used by Duro et al. (2013) (see Appendix). However, given that this is a relatively abstract topic, two of the students were also asked to bring along a recent piece of written work to reflect on during an additional stimulated recall interview. The theoretical foundation for using such a stimulus relies on "an information processing approach whereby the use of, and access to, memory structures is enhanced, if not guaranteed, by a prompt that aids in the recall of information" (Gass & Mackey, 2000, p. 17). The assumption therefore, is that it is easier for students to discuss issues surrounding critical thinking when they have a particular concrete experience in mind. Due to the variation in essay submission deadlines and examinations, unfortunately it was not possible to conduct the stimulated recall

element with all four students. Interviews were recorded and transcribed verbatim.

Analysis of Data

A thematic coding approach was used for analysis. As stated by Robson (2011), this method "provides a means of summarizing key features of large amounts of qualitative data using a principled approach" (p.477) and consists of five key phases: familiarizing yourself with the data, generating initial codes, identifying themes, constructing thematic networks, and integrating and interpreting. Key themes which emerged included, for example, critical thinking across disciplines, the role of the tutor, and prior educational experiences.

Ethical Considerations

It is important to recognize that "all research involving groups of people interacting with each other has an ethical dimension" (Wilson & Stutchbury, 2009, p. 65). This study was conducted in line with the guidelines set out by the British Educational Research Association (BERA), which states that "all educational research should be conducted with an ethic of respect for: the person, knowledge, democratic values, the quality of educational research, and academic freedom" (2011). Students were fully informed about the aim of the study and gave their consent to take part. All reasonable measures were also taken to ensure the validity and reliability of the research. For example, the use of both general interview questions and retrospective stimulated recalls based on a specific task allow for some form of triangulation which contributes to the internal validity of the study.

Results

How Do Students Understand the Term "Critical Thinking"?

There were three main themes which emerged from the interviews with regard to the students' understanding of the term critical thinking. First, they overwhelmingly considered it to mean not taking everything at face value; second, it was viewed as an

evaluation of the ideas of others in order to develop their own thinking; and third, there was some uncertainty surrounding the difference between critiquing and criticizing. However, all students believed strongly in the importance of developing critical thinking skills. This section will consider each of these themes in turn.

Not taking everything at face value. Interestingly, even though the students found critical thinking to be quite an abstract concept and something which they found quite difficult to do, as will be explored further below, paradoxically they seemed to be able to provide a definition quite easily. All of the participants primarily conceptualized critical thinking as "not taking everything at face value" (Lucy). Denise similarly suggested, "[I]t's like seeing a piece of evidence that's like, 40%, and thinking about the 60% as well, like, kind of looking at it more all-rounded." Interestingly, all of the examples they gave were specifically related to the evaluation of empirical studies, such as considering "the strength and limitations of studies" (Orla) and "thinking more about the study itself" (Maria), rather than engaging more generally with concepts.

Evaluating the ideas of others to lead to your own. There was also a consensus that the first step in critical thinking is to "look at what other people have said about something" to then "come up with your own ideas" (Orla) or "come up with your own conclusion of which one you think is stronger and why" (Maria). Yet, while Denise expressed a similar view, she was much more tentative in doing so and was unsure about the sort of evidence she could provide to support her own opinions:

> I mean at this stage you're not a researcher, it's kind of hard to be like, this is my view and I have the research to support it. But I feel that you can kind of, like, even if you are going to side with the yes or no, it just helps to say, you know, I can understand why people would believe this but this is the kind of, this is what they're not looking at, or this is what they're missing. Which I think is important.

Critique vs criticism. The above quote from Denise also somewhat links to the next key theme which emerged in the interviews, which was the role of criticism in critical thinking. While the students' views on the above themes were more or less in line with each other, this was the key point in which there was some disagreement. Orla thought of critical engagement with studies as a consideration of "what was wrong, what they could have done better" and seemed therefore to conflate critique with criticism. Maria was more tentative in this regard and instead spoke about negotiating the "fine line between sort of just being like 'I think this, that's why this study's wrong' and, kind of like, engaging with it

properly." However, she was unsure what exactly she meant by "engaging with it properly."

Lucy, on the other hand, positioned herself very much as a "student" and struggled with how to engage critically with (which she also associated to some extent with criticizing) published works:

> There's no way I'm challenging someone who's done 10 years' worth of study on something they feel so passionately and strongly about… I'm not going to say that's wrong, like, because surely you've put so much into that and I'm just coming in with like, literally 3 or 4 months' worth of knowing about this, and how can I really give a valid interpretation of that?

Lucy, therefore, identified building up what she referred to as "foundational knowledge" in a subject as crucial for being able to engage critically with it and to provide a solid justification or rationale for opinions. This view was echoed by both Denise and Orla, with the latter stating, "[T]he more you read, the more ideas you're aware of and the more things you can use to engage with something."

Importance of critical thinking. One theme which emerged among all four participants was the importance of developing critical thinking skills, not just for their current course, but also for their future careers. Interestingly, all of their comments related to the broader societal relevance of such skills rather than more immediate, instrumental reasons related to getting good marks in exams and essays. Lucy, for example, is considering a career in teaching and viewed critical thinking not only as important for her own development, but also as a key skill she would pass on to her own students one day:

> I think it's quite important to instil that idea of telling them to not just take everything at face value and maybe have their own perceptions and readings of things, and to do it from a young age I think would be a really productive skill for children to learn.

The implication here is that, for Lucy at least, critical thinking is a skill which can be actively taught and developed. Similarly, Maria said that she couldn't imagine a career where it would not be relevant. Orla and Denise focused more on the importance of critical thinking more generally in today's society. Denise in particular felt strongly about this:

> [I]t should be a massive priority, especially in the world we live in now, this like, 'fake news' world… I think it's important to kind of, make people actually think and sort of build the world for themselves rather than just like, accept it. Cause I feel that you need to be able to think to make any form of like, change I guess.

What are the Key Factors Which Influence the Way in Which Students Conceptualize Critical Thinking?

This section will consider the extent to which prior school experience and, crucially, different subjects and disciplines influence the way students conceptualize critical thinking.

Prior school experiences. There were several comments which indicated that the students had very different prior experiences in terms of explicit exposure to critical thinking as a skill more generally. Lucy, for example, mentioned that she only became aware of critical thinking in university, as she perceived that in school, "[Y]ou're not really as much taught to question things, you're just kind of taught this is a study and this is what it means." For Orla, critical thinking had been present at school, but very implicitly and she seemed to have lacked an awareness of this at the time:

> I don't think we used that exact term at school, but when we started using it here I thought ah, that's what we did in like, psychology when we were discussing limitations and stuff of studies. But we didn't use the term critical engagement.

At the other extreme, Maria spoke of having had timetabled "critical thinking" classes during her first three years of secondary school (age 11-14). She described it as "kind of like history," where the teacher would circulate a source text and lead a discussion. Yet when asked whether she felt this helped her to develop her thinking skills, she said, "[W]e didn't really know [how well we were doing] I suppose… [I]t was just sort of like a little thing we did once a week." As such, it was not assessed, nor does she remember receiving any form of feedback either formally or informally.

Even though the varied experiences of the students in secondary school did not seem to influence strongly their current conceptualizations of critical thinking, it raises questions surrounding the explicitness of teaching such skills. If this is so implicit that the students are not aware of what they are doing, to what extent will they be able to develop these skills or indeed transfer them to different contexts?

"Critical engagement in one discipline is completely different to another one." As this quote by Denise suggests, the overwhelming factor which seemed to influence the way students thought of, and engaged with, critical thinking was the particular discipline or subject. Lucy went a step further and suggested that "it's easier to be critical in some subjects than others". The main differences were discussed in relation to psychology, sociology, and philosophy, three of the four core disciplines of education covered in the first-year course. All students also referred to English literature; even though only two of them were currently studying this as part of their degree, all had studied this to an advanced level in school.

Critical thinking in psychology was very much considered from a "research methods point of view" (Denise) and was generally viewed to be slightly easier as it was more "controlled" (Denise). Orla described it as almost formulaic: "[T]here are almost like, a limited number of like, things you can say about the study like, you always refer back to like, sample sizes and generalisability and just like, use the same sort of terms." In sociology, however, students were a lot less clear about how to demonstrate their critical thinking. Lucy described it as "really different in terms of how you engage with stuff… you'd have different theories and then you put them against each other," which was perceived as more difficult to do. Denise admitted that she didn't really understand how critique works in sociology, "so I don't really engage with it that much."

Similar comments were made by the students in relation to the two more humanities-based subjects: English literature and philosophy. Critical thinking often arose because "there's no right or wrong answer, so it's just how you engage with the text mostly and sort of, engage with ideas" (Maria). It was seen to some extent as more "broad" (Orla), yet also more accessible because students felt that there was less chance they could be wrong: "[Y]ou can listen to more perspectives and then develop your own, whereas in science I feel like it can often be a lot more right or wrong, or like provable or not provable" (Denise). Lucy also felt like that in subjects like English it was possible to justify her views based on the text in front of her, and there was therefore less pressure to have wider "foundational knowledge."

It seems, therefore, that that students' perceptions of, and engagement with, critical thinking differ widely between subjects and disciplines. As such, their views are unlikely to be very coherent if the underlying attitudes and perceptions of the disciplines (and maybe by extension the way in which the various tutors address critical thinking) differ so widely. Perhaps then, tutors and supervisors should engage more explicitly in dialogue with students and each other about the differences and particular expectations in a certain field.

What strategies could be used to support students' development of critical thinking skills?

This section will consider two key themes which emerged in relation to supporting students' development of critical thinking skills: the need for practice and explicit guidance and subsequently the role of feedback.

The need for practice and explicit guidance. Firstly, it is worth noting that all of the participants referred to critical thinking as a skill which can be developed through practice rather than a static trait, yet this raises questions about the extent to which it is a

skill which is actively taught. The general consensus among the students was that they were aware that they are supposed to demonstrate critical thinking in their work and that this is a key criterion in assessments; however, they are often unsure about how to go about doing this or indeed, in some cases, how to recognize it in their own work. As stated by Orla:

> The difference between what you do to get a first and what you do to get an upper second and things like that, it's like one word difference and it's like 'excellent' or 'very good'… there's nothing quite like, specific that says what you need to do, which would be nice.

As explored above, this will also be different depending on the subject or discipline and therefore perhaps some clear content-specific guidelines and examples would be of help.

Denise also suggested, "[I]t would be really helpful, like, to have someone explaining, this is how you compare things or this is how you place things on a sort of scale of, you know like, importance or relevance." Lucy similarly suggested, "[I]t helps to have an awareness of what kind of questions we need to be asking, because it's quite hard to know what you're meant to be looking for." It seems therefore that the students would appreciate the rather abstract process of critical thinking being demystified and made explicit. Using "thinking aloud" as a teaching technique in supervisions or tutorials could therefore be one possible way of achieving this. This would not only give students an insight into the process of critical engagement, but also would also serve to develop their own metacognitive awareness of how they, and others, engage with studies or texts.

Linked to this, it is also important to help students to develop the ability to critically reflect on, or self-assess, their own work. Stimulated recall interviews were conducted with both Lucy and Denise following a mock examination essay. Although they both produced essays of a good standard, interestingly they both found it difficult to pinpoint concrete examples of critical thinking in their own work, and neither picked up on what the assessor identified as the best critiques.

For example, Denise identified a section where she had commented on the population validity of a study she was referring to "'cause it's got like, a lot of people in it so it kind of reduced the impact of, like, individual differences and individual variables," but she then added, "[B]ut I didn't really get a chance to explain that." When asked what she meant by this and what she would have done differently, she said, "Well, I would have just said 'which means it can be applied to more people because of this reason,' but it's just, it's just a time thing, so I'm going to have to assume that people know what that means." Here she focused much more

on definition rather than critical engagement. Lucy also admitted that she found it "really difficult" to assess her own work and as a result had never really engaged in this independently.

Interestingly, both Denise and Lucy were able to speak relatively easily about more abstract definitions of critical thinking, as discussed above, yet found it difficult to identify in their own work. This further highlights the need to be explicit about what critical thinking is within a particular course or discipline and the need to indicate to students when they are doing this, as explored further below.

The role of feedback. The students identified targeted feedback as being crucial in supporting their development of critical thinking skills. When giving written feedback on essays for this course, the tutor had previously developed a table to group comments into key areas identified in the mark scheme such as "reference to the literature" and "critical engagement". When asked about this in the interview the consensus was that it was helpful. Maria, for example, said, "[H]aving that feedback there is useful and sort of actually realising to what extent you've thought about it critically". She also found it helpful when indications were made on her essay of both good examples of critique and where she should have engaged further. Orla similarly commented that targeted feedback was helpful in drawing her attention to the importance of critical engagement in relation to the mark scheme, since she was "not even sure if [she was] meant to do it" in all of her courses.

However, when asked about peer assessment, the students expressed much more reluctance, which seemed to be underpinned by a lack of confidence/trust. Denise commented, for example, "Even if it's terrible, they probably wouldn't tell you." Yet, given the difficulties the students seemed to encounter in identifying critique in their own work, perhaps providing them with more opportunities and guidance to engage in effective peer feedback could help develop their awareness and evaluative skills more generally.

Discussion and Conclusion

In their study into the understanding of critical thinking among undergraduate students, Duro et al. (2013) reported that their participants' comments were initially very vague. However, in the current study the participants seemed more readily able to define critical thinking, even though they found it more difficult to do and to identify in their work. This may be a result of the increasingly explicit emphasis on critical thinking in course overviews and grading schemes. In this study, students' views seemed to align largely with the more cognitive conceptualizations of critical thinking as proposed by Ennis (1962); as such, for them it involves

an element of evaluation (and sometimes criticism) of the work of others with a view to presenting one's own opinions. In line with Scriven and Paul (2008a) they also viewed critical thinking as a skill which can be learned and developed, as well as one which is facilitated by increased knowledge of the field.

Yet interestingly, the participants in this study seemed to approach and operationalize critical thinking differently according to the subject or discipline they are working in (in line with McPeck, 1981 and Willingham, 2007) rather than viewing it as transferable across contexts. Given the largely discipline-specific views which emerged from the participants, it seems therefore important to engage more explicitly in discussion about these differences, not only with the students, but with colleagues from other academic backgrounds. Given that students of education work across a range of disciplines, they may benefit from more explicit guidance in how critical thinking skills in one area can be transferred to another. As suggested by Mulnix (2012), critical thinking can transcend disciplines and "has little to do with *what* we think but everything to do with *how* we think" (p. 466). This highlights the key role of metacognition in critical thinking. Metacognition typically refers to the overarching, reflective functions that control and monitor more subconscious processes (Desautel, 2009), and is sometimes more simply defined as 'thinking about thinking'. Both Swanwick et al. (2014) and Mulnix (2012) identify metacognitive awareness as one of the key principles of critical thinking. Findings from this study similarly highlight the importance of developing students' metacognitive awareness in order to enable them to better evaluate their own work. Raising metacognitive awareness is also important in sensitizing students to variations between disciplines and encouraging transfer.

Due to the small-scale nature of this case study it is not possible to make generalizations. However, given the importance of engaging in critical thinking across a wide range of university courses at both undergraduate and postgraduate level, the findings from this study offer insights into how a particular group of students conceptualize critical thinking and provides some suggestions of what practitioners can do to help further support students' development of this skill. Implications for practice include the importance of:

- Explicit demonstration and explanation of critical thinking within a particular discipline;
- Providing substantial opportunities for practice, as while the above demonstration will help to draw students' attention to critical thinking, they will only progress through engaging in this themselves;

- Developing students' metacognitive awareness and their ability to reflect on their own work;
- Incorporating explicit comments about critical engagement into feedback and indicating examples of where students have done this well;
- Engaging in dialogue about the extent to which critical thinking skills are discipline-specific and highlighting opportunities for connection-making and transfer between different contexts.

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Appendix

Interview prompts

General questions

- Contextual questions about subjects studied at school.

- What does the phrase "critical thinking" mean to you?

- Can you remember when you first heard the term "critical thinking" being used? (Was it referred to at school or only when you started university? If at school, in what context? For which subjects?)

- Has your understanding of "critical thinking" changed since you have been at university?

- When the term "critically discuss" appears in an assignment title what do you think you are being asked to do? How do you do it? Do you find it difficult?

- How do you think students could improve their "critical thinking" skills? Is there anything in particular you think would help?

- How important do you think "critical thinking" is to the field of education? Do you think it means something different in other subjects?

- How important do you think "critical thinking" is for your future career?

Stimulated recall questions

- Looking at this example of your most recent essay, how did you plan to demonstrate critical thinking for this particular question?

- Can you find an example where you think you have demonstrated critical engagement and talk me through what you did?

- How would you evaluate this essay against the mark scheme? Why?

- Do you think you could have done better in this essay? If so, how?

First Impressions: Student and Faculty Feedback on Four Styles of Syllabi

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Recommendations about syllabi design have emerged over the last two decades. From a Promising Syllabus, to a Graphic Syllabus, to a Student-Centered Syllabus, faculty are encouraged to purposefully set the tone with this document. Few studies examine students' impressions of these documents. In order to do this, we created four types of syllabi with consistent course content. First, we presented a focus group with four different syllabus types and gathered their comments. Then, larger groups of students rated the syllabi to reflect their impressions of the documents, their instructor, and the upcoming course. Finally, a group of instructors indicated their preferences and reactions. Student ratings revealed a preference for warmth, clarity, and brevity. We discuss notable differences between student and instructor ratings and offer recommendations.

The syllabus has been described as a legal document, a reference guide, and a promise of things to come for a given course. Clearly, a syllabus has several different functions, one of which is introducing students to the instructor's style. Though instructors don't often worry about format, the style and design of a syllabus can set an impression of an instructor and the course. These impressions can serve as an anchor for the tone of the course. In this study we investigate if the strategies outlined in the academic literature are perceived by students as helpful to their understanding and engagement. In addition, we compare instructor perceptions of the syllabi to those of the students. The purpose of this study is to inform faculty concerning their choices for syllabus presentation.

The Importance of Syllabi

Syllabi serve many functions in addition to orienting students to course content and organization. Fink (2012) outlined how syllabi serve multiple audiences, and each audience values the syllabus for a different purpose, such as, "…a communication mechanism, a planning tool for instructors, a course plan for students, a teaching tool or resource, an artifact for teaching evaluation, and evidence for accreditation," (p. 1). Given the challenges of meeting the expectations of several audiences, it is important to consider the principal audience: the students.

The audience may be overlooked when a faculty member approaches the syllabus as a scholarly product, ignoring the fact that the student user merely wants a scheduling tool or a guide to course assessments. Another consideration with the syllabus is that with the greater flexibility of organization afforded by the online environment, syllabi might become deconstructed into multiple items in a learning management system. Regardless of which function it serves, a document called a syllabus is required by many institutions and expected by many students.

Although students expect a syllabus, syllabus design can vary greatly. McDonald, Siddall, Mandell, and Hughes (2010) found that students reported using the syllabus as a reference tool for the course rather than as a document to read like an essay or an article. As faculty consider designing syllabi, it might be useful to consider that it is used primarily as a reference tool. Eberly, Newton, and Wiggins (2001) describe the syllabus also as a document that reflects the values and goals of the university. An instructor must take into account the other audiences for whom the syllabus is important, such as accreditors, transfer credit evaluators, or program administrators. This mix of audiences and purposes contribute to a complicated design issue. In this study we focus on the student audience, and we explore how the first impression of a syllabus creates a context for the students' perceptions of the course and the instructor.

Recommendations for Syllabi from Previous Research

There is no lack of recommendations for how to design a syllabus in the literature on teaching and learning, although not all the recommendations include student perspectives.

Breen (1987) and Nunan (1988) discuss how the syllabus structures the learners' experience of the material in a course. Breen (1987) suggests that a syllabus should function as a coherent plan for how a student should understand the content, should convey a sense of the teacher's pedagogical orientation, and should provide an outline of what the course achieves, the means by which learners will be assessed, and documentation of the course for accountability purposes. Nunan (1988), in his book *Syllabus Design*, also speaks of the syllabus as a form of curriculum design. He specifies that a syllabus communicates selection and grading of content as well as the methodology of the course. In presenting a course schedule, the instructor is also

communicating a specific approach to the material. This may be more information than a student wants. This study examines whether students perceive this deeper communication of the syllabus and what students prefer to get out of this document.

Viewing the syllabus as a part of the teaching process, McWilliams (2015) discussed a negotiated syllabus that he described as "democratic syllabus". He reported that it was favorably received by eight highly motivated seniors in a small seminar. Similarly, Weimer (2002), in her book *Learner Centered Teaching*, suggested that instructors should allow students to "discover" in lieu of "going over" the syllabus content. She proposed providing options and choices in a syllabus that would allow students to personalize their learning experience. Weimer also suggested that the instructor offer students time in class to digest the syllabus, then administer a quiz that fosters a more in-depth examination. These two approaches to syllabus design are predicated on supporting students to become engaged in their learning. The process gives students control through participating in creating the syllabus. This approach may be more successful with experienced students who are more predisposed to find the process engaging. Kaplan and Renard (2015) also recommend student involvement. They assert, "Negotiating the syllabus positively affects learning through increasing motivation and reinforcing course objectives," (Kaplan & Renard, 2015, p. 415). In this case, students are negotiating types of assignments and assessments.

The Promising Syllabus is yet another approach to fostering student engagement in the content of the course. In his book, *What the Best College Teachers Do*, Bain (2004) describes the Promising Syllabus as a way to engage students in their own learning by fully explaining how students will benefit from a course, what they will do to realize that benefit, and how they will demonstrate the nature and progress of their learning. Hirsch (2010) enthusiastically endorses the Promising Syllabus in a case study of how she used it in one of her courses and perceived increased student engagement in an upper-level undergraduate course and her graduate courses.

Canada (2013) also agrees that the syllabus should be the first locus of student engagement with a course. Canada recommends creating a document that is easy to read, friendly, supportive, and clear about what the student will get from the course. These recommendations focus on tone and organization of the content, although Canada does not offer any direct data for the success of this approach. Nilson (2007) similarly focuses on organizing the material in the syllabus to give an overview of how the course is structured. Nilson recommends a graphic syllabus that maps topics to learning outcomes, and learning outcomes to assessments, so that students can perceive the progression of skills and connections with assessments in the course.

Dean and Fornaciari (2014) also view the syllabus as a teaching and learning tool that should respect the relationship between the instructor and the adult student, but they take a more practical approach in their recommendations. They suggest that the syllabus should acknowledge the reading habits of modern students by making the syllabus direct. The electronic nature of reading on mobile devices requires the syllabus to be succinct. They also recommend dispersing larger chunks of text, like assignment descriptions, into separate files to accommodate data limits.

The above authors recommend different forms of syllabus from the instructor's point of view. In addition, there are studies that include student perceptions as the basis for recommending different syllabus designs. Harrington and Gabert-Quillen (2015) conducted a study with community college students who were randomly assigned to one of six syllabus conditions focusing on syllabus length (i.e., short, medium, and long) and the inclusion of images or not. Participants completed questionnaires and participated in a focus group regarding their perceptions of the course and the professor. Students reviewing the medium or long syllabi, as compared to the short syllabus, had a more positive impression of the course and professor. No significant differences were found for images versus no images. The majority of students, 66.6%, indicated a preference for a long syllabus with all assignment details versus a shorter syllabus with assignment details being provided later in the semester.

In general, there is a consensus in the literature that the syllabus should function as an invitation to the course and be a tool to initiate engagement in a course. Although the proponents of learner-centered syllabi phrase the recommendations as oriented towards the student, frequently the students' voices in how they actually use a syllabus are often not referenced.

Though there are a number of recommendations and examples for instructors, there is little student reported evidence for one style over another. The majority of the student reports are from the students who were taking the classes with the instructors who were offering the course. In order to inform our own practice and the recommendations we make at various faculty development workshops, we gathered students' perceptions of styles that are common at our institution. To gain a more general perspective and to standardize ratings across course type, we did not ask students about syllabi in the courses they were currently taking, but rather the syllabus types were different versions of standardized fictitious course content, and we asked students across several disciplines to participate.

Method Study 1: Focus Group

Participants

Participants were eight student ambassadors who completed required volunteer hours by participating a two-hour focus group. These second, third, and fourth-year students had high GPAs (over 3.0), had earned scholarships for their service to the college, and were chosen for their leadership ability. These were highly engaged students from the outset, and by this point in their academic careers, they were highly invested in the disciplinary expectations of their majors.

Materials

Four syllabi were created with the same instructor name, course names, course descriptions, dates, and assignments. Other content varied according to the style of the syllabus such as tone, phrasing, and procedural information specific to the style.

1. Newsletter (e.g., Hangen, 2011). This syllabus had graphics to accompany the text and was arranged in the format of a newsletter with headers, columns, attention-grabbing quotes, and call-out boxes. This style highlighted the organization of the course content.
2. Promising (e.g., Bain, 2004). This longer, text-heavy syllabus had extensive explanations of the course content, the rationale for activities, and the relationships of readings to the course content. Student learning outcomes were explained in the context of the assignments, and the teaching philosophy was explicitly outlined in the text of the syllabus.
3. Simple. The Simple Syllabus was direct and concise. Information was provided in tables and bulleted lists. More complex assignment descriptions were provided as separate documents.
4. Warning. The Warning Syllabus was similar to the Simple syllabus but differed in tone. The Warning Syllabus emphasized what student should not do, often in bolded and underlined text. For example, due dates, penalties, and the fact that late assignments are not accepted were emphasized.

Procedure

As part of their required service hours, the students in the focus group met with the researchers on campus to discuss the four syllabi. In a two-hour discussion, the students looked at each syllabus and discussed their impressions of each syllabus, including their perception of the course, their perception of the instructor, and their perception of the content. The focus group session was recorded in the form of researcher notes.

Results Study 1: Focus Group

Because these were upper level students, this group was sensitive to disciplinary expectations. They asserted that syllabus preference depends on one's major and what one expects from that style. For example, the business students liked the Simple Syllabus, the e-media students were highly critical of the Newsletter design, and the history students were more predisposed to read the Promising Syllabus. Regardless of disciplinary expectations, all of the students agreed that the syllabus is a reference document, not something to read. For these students, due dates and the daily schedule were most important, and they wanted the professor's contact information to be clearly indicated on the front page. They noted that they preferred an explicit invitation to ask questions, for example when the professor included a statement along these lines: "Please come see me if you have any questions about the course." In their discussion, students clearly referenced the document function primarily as a reference document to be scanned, but they did indicate that they found the design to be an expression of the professor. One student, with whom the other heartily agreed, said, "The syllabus is just for reference. Save your jokes and motivational speeches for when you talk about the syllabus with us. Don't put that in the syllabus."

Specifically, the students in the focus group found the Newsletter style syllabus to be unprofessional but friendly. They did not feel that the graphics engaged them any more than the text did because they were only looking for specific information. Nevertheless, they did comment that the graphic organization did communicate a sense of friendliness on the part of the professor. There was unanimous agreement that nobody would read all the text of the Promising Syllabus. They commented that it was too hard to find the necessary information and said that the motivational pieces of the syllabus could be class discussions and did not need to be in what they viewed as a reference document. The Warning style syllabus received mixed reviews. The students liked the direct style of the organization, but they found the warning tone, the emphasis on what not to do, and the focus on penalties to be a negative extension of the professor's personality. One student said that he thought the professor was trying to help students avoid potential problems and was helpful, but most said it was blaming them for something they had not done yet. The simple style, neutral tone syllabus was most favored by all of these students. They indicated this style functioned

Figure 1
Student ratings of impressions of the instructor by syllabus type
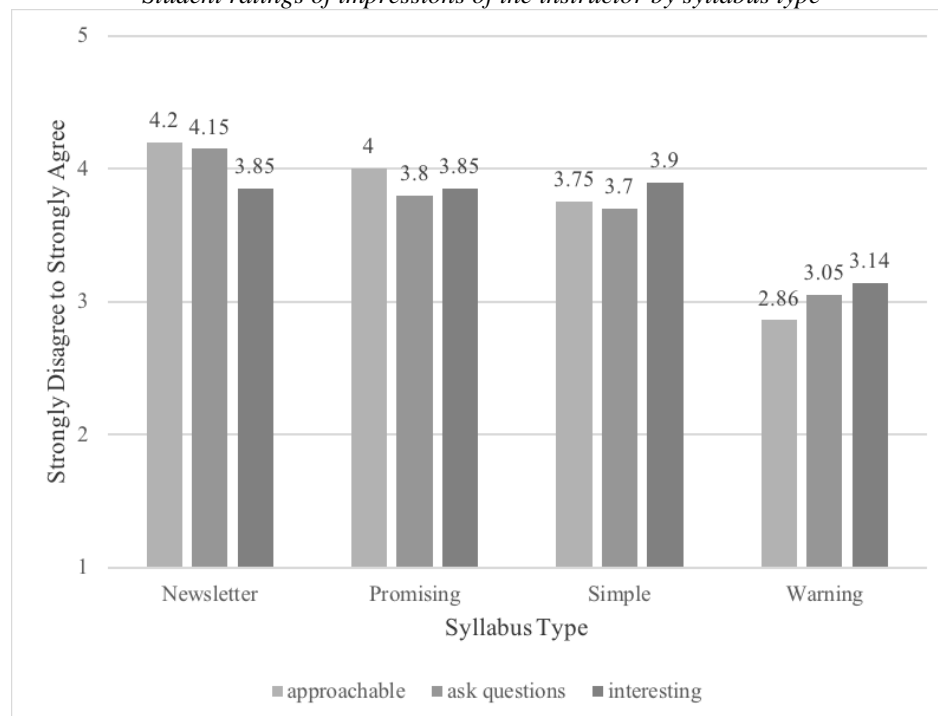
Note. Ratings were made on a 1(Strongly Disagree) to 5(Strongly Agree) Likert Scale for the statements: This professor is approachable. I would feel comfortable asking this professor questions. This course will be interesting.

best for the purpose they saw for a syllabus. They were satisfied that further information and professor personality could come later, in class.

Method Study 2: Student Ratings and Comments

Participants

Participants were 83 students from first-year courses in psychology, math, and English at an open-access, two-year college. The student population of the college has a high percentage of first-generation students, the majority of the students also hold jobs in addition to their studies, and the campus is the most diverse campus of this university system. In these first-year courses, few have declared a major, and these students are often still acclimatizing themselves to academic cultural expectations. Participation was optional, and the 10-minute activity was conducted during class time.

Materials

The same four syllabi from the focus group were used. Students were given the four syllabi and a survey for their impressions of each syllabus. The survey included eight Likert scale questions about the course,

e.g., "I would look forward to taking this course," eight about the Instructor, e.g., "I will find this professor to be approachable," and four about the syllabus, e.g., "It is easy to find information." These were all rated on a 1(strongly disagree) to 5(strongly degree) Likert scale. Students were asked how long they would spend reading the syllabus in minutes and what they liked and disliked about the syllabus. They were also asked to describe a syllabus that they have had that was particularly well done (See Appendix for the entire survey).

Procedures

First and second-year students in psychology, math, and English sections were asked to complete the surveys as part of a class activity. Across all sections, 83 students completed the survey for each syllabus. The syllabi were shuffled in order to counterbalance the order in which students rated them.

Results Study 2: Student Ratings and Comments

Numerical Ratings

Figure 1 shows students' impressions of the instructor and the course by syllabus type. The

Figure 2
Student ratings of the syllabus by syllabus type
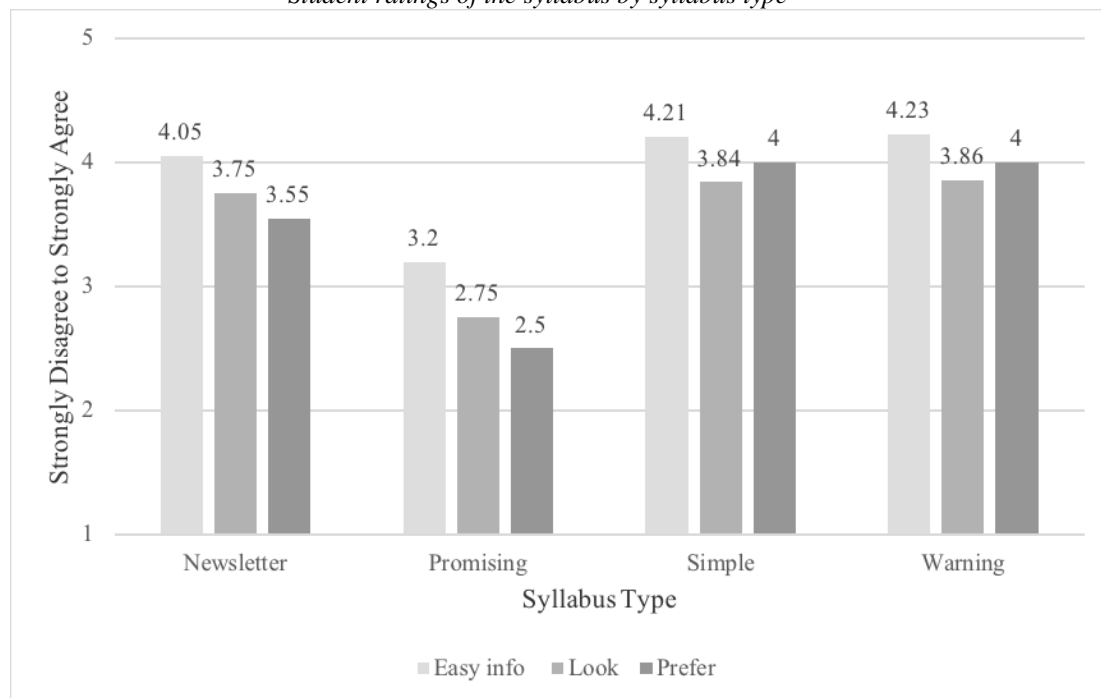
Note. Ratings were made on a 1(Strongly Disagree) to 5(Strongly Agree) Likert Scale for the statements: It is easy to find information. I like the look of this syllabus. I prefer this type of syllabus.

Newsletter style was preferred, as it showed the professor as most approachable and most welcoming of being asked questions. The Newsletter, the Promising Syllabus, and the Simple Syllabus were all seen to communicate about equally that the professor was an interesting person.   Not surprisingly, the Warning Syllabus was strongly perceived to show the professor as unapproachable, not welcoming of questions, and not particularly interesting.

Figure 2 shows students' ratings of the four styles of syllabi in terms of ease of finding information, having a pleasing look, and general preference. The Simple Syllabus and the Warning Syllabus were seen to be about equal in all three measures of appearance. The Newsletter style was seen to be easy for finding information but was not rated as highly for a pleasing look nor generally preferred. The Promising Syllabus was strongly disfavored by ease of information, look, and preference.

Figure 3 shows students' estimate of the number of minutes they would spend reading the syllabus. In general, students expected to spend about eight minutes reading the Newsletter, the Simple Syllabus, and the Warning Syllabus. They estimated more than twelve minutes to read the Promising Syllabus, which they suggested was much too long a time to spend reading a syllabus.

Students found the Simple Syllabus to be most engaging because it was the easiest to understand. Table 1 shows the student ratings of how they perceive the course content on a five-point scale. Students most looked forward to the course based on the Simple Syllabus and least based on the Warning Syllabus. Students perceived the course to be most challenging based on the Promising Syllabus and not quite as challenging based on the Newsletter Syllabus. Students rated the Newsletter, Simple, and Warning Syllabi as equally easy to understand the purpose of the course, but they rated the Promising Syllabus purpose as least easy to understand. These ratings were elaborated on in the open-answer section of the survey.

Student Open-Ended Comments

In general, students had rated the Newsletter Syllabus as communicating a friendlier presence of the instructor, and they commented that the fun style is welcoming. However, they reported that this fun, approachable style did not communicate a very serious approach to the subject matter. The Promising Syllabus was seen as being more serious, and one student wrote, "I like how the professor put effort into it. It shows that they really want students to know what's going to

Figure 3
Student estimates of time they would spend reading the syllabus by syllabus type.
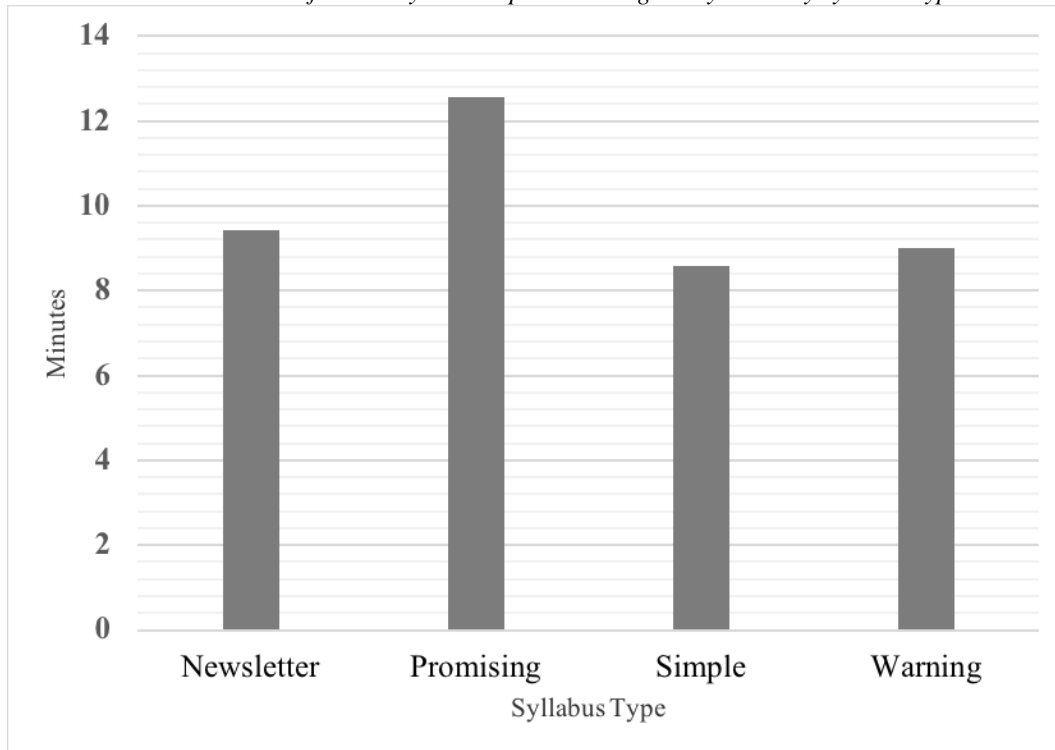
Note. Student estimates were provided in minutes

Table 1
Average responses to Perceptions of Course Content on a Rating Scale of 1 to 5

Syllabus Style	I look forward to taking this course	The course will be more challenging than usual	I understand the purpose of the course
Newsletter	3.18	3.15	4.1
Promising	3	4	3.75
Simple	3.86	3.4	3.95
Warning	2.8	3.52	4.14

happen." Nevertheless, the amount of text in the Promising Syllabus was not perceived to be welcoming by the majority of students who found it to be wordy, overwhelming, and intimidating. The Simple Syllabus received the most positive commentary in the open answers. One student wrote, "Everything is broken down so it is easy to read." However, some did comment that it was bland and boring, although the commentary did not indicate that this was perceived to be a problem. The Warning Syllabus received the most negative commentary. One student summarized the general consensus: "If the professor is trying to intimidate students, it's working!" Students commented that the syllabus seemed condescending, and it felt like the professor was blaming students for bad behavior in advance. They asserted that, "You can be tough and firm, but you can do it nicely"

The consensus from the open-ended questions was that organization was key to a good syllabus. Students agreed that contact information should be up front and easy to find. They commented that they preferred the course schedule to be in a table with clear due dates and that the policies should be clearly labeled for later reference. Long paragraphs of text were perceived to be too onerous to read.

Method Study 3: Faculty Survey

Anecdotally, faculty seem to regard the syllabus as a document that a person should read, not scan, in

contrast to student perceptions of the purpose of a syllabus. A common complaint among many faculty is, "The students won't read the syllabus." We wanted to find out how faculty perceptions of the syllabus compared to the student perceptions.

Participants

As part of a faculty development workshop, 56 faculty participated in a survey comparing their preferences to their predictions of student preferences. These were mostly full-time faculty who taught a range of undergraduate courses for both majors and non-majors. Due to their presence at a workshop for syllabus development, these were faculty who were predisposed to consider syllabus design from a student-centered point of view.

Materials

Faculty were asked to consider the same four syllabi that the students in the previous studies had been given. They answered two questions in an electronic poll concerning how much they preferred a given syllabus and how much they predicted students would prefer the given syllabus. Each faculty member rated all four syllabi.

Procedures

During a workshop on syllabus design, groups of four faculty were given the four syllabi. They discussed the merits of the four syllabi in their groups, and then each individual rated their preference and their predicted student preference on the electronic poll for each syllabus.

Results Study 3: Faculty Survey

Faculty indicated the greatest preference for the Newsletter Syllabus and also predicted that students would prefer this style most (see Figure 4). Next in preference was the Simple Syllabus, which faculty predicted students would prefer more than faculty would. Faculty indicated a higher preference for the Promising Syllabus than they predicted students would express. No faculty expressed a preference for the Warning Syllabus, and they predicted that students would feel the same way.

Discussion

In general, students expressed a strong preference for the Simple Syllabus and a strong lack of preference for the Promising Syllabus. In contrast, faculty expressed a stronger preference for the Promising Syllabus than students did, and they expressed a stronger predicted student preference for the Newsletter Syllabus than the students expressed. Both students and faculty expressed a lack of preference for the Warning Syllabus. Experienced faculty members predict where students will run into difficulty, and though well-meaning, may focus on what can go wrong. This attempt at good advice can create a negative tone that is present in the Warning Syllabus.

Figure 4.
Faculty preferences for syllabi and predictions about students' preferences
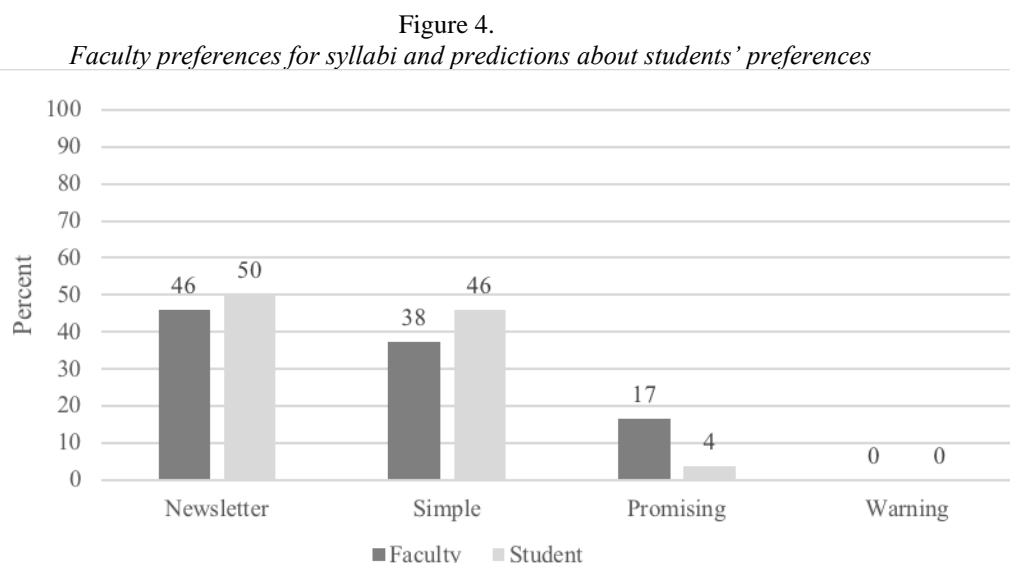
Note. Faculty selected their favorite syllabus type and predicted students' preferences.

This contrast between faculty and student preference could be due to the conflicting perspectives on the genre of the syllabus. Faculty seem to view the syllabus as something of great interest that should be read. This could be because the syllabus is often perceived to be a creative work on the part of the faculty member, as well as a representation of the effort he or she has put into the course. From the students' point of view, the syllabus should not involve that much reading. Rather, a syllabus is seen to be a reference document to be scanned for procedural information. It is possible this conflict of reading norms accounts for the student lack of preference for the Promising Syllabus because it is explicitly a document to be read, not scanned.

In general, students in these studies indicated that they preferred a syllabus that included the following elements:

- Neutral tone
- Contact information on the front page in large font
- Due dates in tables or lists
- Policies phrased positively
- Content organized with bold headers
- Length of 3-5 pages with supplements of more detailed content as separate handouts for class

These findings corroborate the findings of McDonald and colleagues (2010). These researchers found, "Based on the more than 800 comments about syllabus user-friendliness, the design elements students most appreciated included clarity (i.e., language and format), conciseness (i.e., complete information), consistency of formatting (e.g., sub/headings, bulleted items, font size/type), sound organization (e.g., easy to locate specific information or sections), and a friendly but professional tone (e.g., approachable language)," (p. 116). Clearly students see the syllabus as reference that should be easy to consult and which does not require effort to find information.

Faculty preference for the Newsletter format and for the Promising format may indicate that faculty may place more emphasis on the syllabus as a key interactional document that functions as a mediator between the faculty member, the content of the course, and the students. This perspective may not be shared by students who see the syllabus as a reference tool. Students expect that the engagement in the course will come from direct interaction with the faculty member and the content of the course rather than this document. The prominence of the syllabus as a communicator of teaching style, structure of content, and over-arching rationale for the course may not be as salient for the students as for the faculty member. Upper level students who may feel more investment in their courses may enjoy negotiating the syllabus with the faculty member since they have more experience with how a course functions. First-year students, particularly those who may be new to college cultural expectations, may feel more comfortable with a simple declarative syllabus that lays out the path of the course with the true engagement taking place in the classroom as they learn how to "do college."

In designing a syllabus for a course, we advise faculty members to create Simple Syllabi for lower level courses to help students learn the expectations of how to use a syllabus, and then to create more discipline specific syllabi as students become more accustomed to the expectations of a major and the appropriate discourse styles for those majors. Finally, the concern that "students don't read the syllabus" is well founded. These students do report that they indeed don't read the syllabus because they use it for a reference scanned for just-in-time information. Perhaps it is worthwhile to have a discussion with a given class on the first day to clearly communicate expectations about the function of the syllabus for the class, as well as for the faculty member to ask the students how they prefer to use the syllabus so that faculty expectations and student expectations can be more similar.

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Appendix

Syllabus Survey

Syllabus Questionnaire

Please indicate your agreement with the following items from 1 (strongly disagree) to 5 (strongly agree).

		Neither agree		
Strongly disagree	Disagree	Nor disagree	Agree	Strongly Agree
1	2	3	4	5

About the Course

1) This course will be more challenging than the typical 3000-level college course.

1	2	3	4	5

2) The structure of the course makes sense to me.

1	2	3	4	5

3) I understand the expectations for my performance in this course.

1	2	3	4	5

4) This course looks interesting.

1	2	3	4	5

5) This course will be easier than the typical 3000-level college course.

1	2	3	4	5

6) This course will be useful to my college education.

1	2	3	4	5

7) I understand the purpose of the course.

1	2	3	4	5

8) I would look forward to taking this course.

About the Instructor

1) This instructor wants me to be successful.

1	j2	3	4	5

2) This instructor will be approachable.

1	2	3	4	5

3) I would be comfortable asking questions to this instructor.

1	2	3	4	5

4) I think this instructor will be interesting.

1	2	3	4	5

5) I think this instructor will be fair.

1	2	3	4	5

6) I think this instructor is knowledgeable.

| | 1 | 2 | 3 | 4 | 5 |

7) This instructor seems very organized.

| | 1 | 2 | 3 | 4 | 5 |

8) I think I like this instructor already.

| | 1 | 2 | 3 | 4 | 5 |

About the Syllabus

1) It's easy to find the information I need in this syllabus.

| | 1 | 2 | 3 | 4 | 5 |

2) I like the look of this syllabus.

| | 1 | 2 | 3 | 4 | 5 |

3) Policies are clearly explained.

| | 1 | 2 | 3 | 4 | 5 |

4) This is the type of syllabus I prefer to get in my classes.

| | 1 | 2 | 3 | 4 | 5 |

For the next items, please write in your answers.

5) How much time would you spend reading this syllabus? _____minutes

6) Is there anything you particularly like about this syllabus?

7) Is there anything you particularly dislike about this syllabus?

8) If you ever encountered a syllabus that has been very well done, what was it like? (only need to answer once)

Characteristics of High-Achieving Students and the Effectiveness of a Low-Cost Program in Three New Zealand Universities

Pam Millward, Christine Rubie-Davies,
and Janna Wardman
The University of Auckland

This article reports on the final phase of a three-phase project and investigates the characteristics of high-achieving students at a university. It also reports student evaluations of a low-cost program aimed at supporting them, assesses their levels of satisfaction, and evaluates the applicability of the program across three institutions in the tertiary sector in New Zealand. Quantitative data were collected from 126 participants prior to the introduction of the program and 55 participants were interviewed. End-of-year data were gathered via a questionnaire and one focus group interview. The findings indicated that the participants appeared to have stronger intrinsic motivation, resilience, and self-belief when compared with participants from other undergraduate groups participating in international studies. Interviewed participants expressed pleasure at being identified as high-achieving, appreciated their involvement in the study, and as a consequence were considering transitioning to postgraduate study. We concluded that this low-cost program was an effective strategy for supporting high-achieving undergraduate students across three different universities' departments and that other tertiary institutions might find the strategy useful.

This article reports on the final phase of a three-phase project investigating the support of high-achieving undergraduate students. Phase One explored the supports for high-achieving students across four large departments within one New Zealand university (Garrett & Rubie-Davies, 2014). The original study arose over anecdotal concerns in one department that high-achieving students were becoming bored with the standard program and that several had "dropped out." Within this same department a staff survey showed that, overall, academic staff were unaware of who their high-achieving students were and had no strategies in place to extend them. The second phase looked more closely at the on-going experiences of high-achieving students within the department that had no existing supports (Millward, Wardman, & Rubie-Davies, 2016). A low-cost program, introduced as part of Phase Two, was designed to formally recognize the achievements of the high-achieving students and to enable peer support groups. At program completion, the high-achieving students reported greater levels of satisfaction with their overall university experience. The students expressed appreciation that their achievement was privately, yet formally, recognized and celebrated. Many noted that the program provided opportunities that enabled them to establish motivational and supportive study groups with their high-achieving peers. A number of the students expressed interest in continuing studies at postgraduate level: something they had not considered prior to the program. The program included the following:

1. A congratulatory letter sent to students who achieved an A grade average across all of their courses
2. An invitation to attend a celebratory morning tea which provided the high-achieving students with opportunities to network with other high-achieving students in their department
3. Invitations to attend academic seminars and public lectures (normally restricted to postgraduate students and staff)
4. Invitations to apply to become mentors for other undergraduate students
5. Advertisement of summer scholarships, opportunities to work with researchers as paid research assistants, and postgraduate scholarships

The primary goal of the final phase of the project was to introduce the same program across three universities located in different New Zealand cities in order to ascertain if this simple low-cost program had the potential for wider applicability across the tertiary sector in New Zealand.

Background

High-achieving students in a university setting may exhibit characteristics that differ from those of other less academically successful students. According to Subotnik, Olszewski-Kubilius, and Worrell (2011), certain psychosocial skills can act as enhancers or delimiters to talent development. Enhancing psychosocial factors include optimal motivation such as envisioning a better future for themselves and increased self-efficacy, grasping opportunities for talent development, having a productive mind-set that keeps them striving to achieve goals, development of psychosocial strength that sees them overcoming potential barriers to goal achievement, and having good social skills which involves ensuring they are well organized and able to collaborate effectively with peers

and colleagues. Conversely, psychosocial factors can act as delimiters to talent development. Delimiting psychosocial factors include low motivation, an unproductive mind-set, low levels of psychological strength, and poor social skills. Subotnik et al. (2011) reported high-achieving students as displaying enhanced psychosocial skills, as well as displaying emotional strength, early psychological independence, intellectual risk-taking, and resilience.

Subotnik et al. (2011) recognized the role of serendipity in academic success. Chance factors such as positive financial, social, and cultural resources can act as enhancers to talent development. Similarly, negative chance factors may act as delimiters and limit resilience. Limiting chance factors include financial restraints such as poverty, or the need to work and support others while studying. Limiting social factors include early exit from school, resulting in a lack of tertiary entry qualifications or school transience as a result of parents' frequent relocations. Cultural limiting factors might include belonging to an under-represented group at the tertiary level or being the first in a family to attend a university. Individuals experiencing limiting chance factors have to overcome challenges that may limit their ability to succeed at the university.

Nevertheless, resilience has been shown to contribute to successful academic and other achievement (Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 2009). Phase Two of our study (Millward et al., 2016) indicated that many of the participants exhibited high levels of resilience or grit enabling them to pursue their studies and achieve very high standards, despite some experiencing limiting chance factors. Hence, resilience may be a factor that enables high-achieving students to overcome otherwise delimiting factors. Thus, we sought to explore the levels of persistence or grit displayed by participants involved in Phase Three of the study.

The researchers were also interested in other psychosocial factors that may contribute to the success of high-achieving students. For example, there is evidence that high-achieving students in the compulsory schooling sector have high academic self-concept (Marsh, 1987; Marsh & Yeung, 1997). It would be useful to more fully explore the characteristics of such students because if high-achieving students demonstrate high levels of motivation and self-regulation, then this information could be used to develop programs for other students in order to increase positive self-belief and motivation. To some extent, the quantitative part of this study was exploratory and designed to identify the demographic characteristics of high-achieving students. The research around high-achieving students at the tertiary level is limited (Abeysekera, 2008; Moltzen, 2008). Further, there were no studies available related to the psychosocial characteristics of high-achieving students.

In order to determine how their motivation compared with that of regular students in tertiary settings, the questionnaire responses of the high-achieving students in the current study were compared with those of students in the original validation studies. Hence, Phase Three was designed to learn more about the psychosocial and demographic characteristics of high-achieving undergraduate students from different New Zealand universities. A further aim of the study was to establish whether or not the low-cost program trialed in Phase Two enhanced high-achieving students' experiences at university. Evidence from Phase Two indicated that high-achieving students benefited from having their achievements formally recognized, as well as from having opportunities to network with other high-achieving students. Learning opportunities facilitated by mentoring other students, attending academic seminars, and working with academics on research projects were also perceived as beneficial (Millward et al., 2016). The program was not designed to further increase already high-achieving students' grades, but to explore more fully any demographic characteristics associated with the high-achieving students and to explore in-depth their psychosocial characteristics.

The Current Study

Through both quantitative and qualitative methods, the study was designed to gain a deeper understanding of the characteristics of high-achieving students. A further purpose was to conduct a small-scale evaluation of the program to determine its effectiveness. Hence, the research questions that underpinned the study were:

1) What are the psychosocial and demographic characteristics of high-achieving students?
2) How does the motivation, grit, and self-concept of high-achieving students compare with that of other students?
3) Does a low-cost program enhance the learning experiences of high-achieving tertiary students?

Method

Participants and Setting

The three departments involved in Phase Three were comprised of two departments of education and one department of science. Participants were studying for Bachelor of Education, Bachelor of Science, or conjoint degrees. All students achieving an A range average across all of their courses were invited to participate in the study ($N = 496$). One hundred and twenty-six high-achieving undergraduate students volunteered to participate. The five-pronged, low-cost program trialed

in Phase Two and described in the Introduction was introduced across the three sites.

Measures

In order to gain a deeper understanding of the psychosocial characteristics of high-achieving tertiary students, the 126 participants completed a questionnaire and 55 were interviewed across the three sites. In order to evaluate the effectiveness of the program in enhancing the learning experiences of the high-achieving tertiary students, one focus group was conducted, and a small group completed a survey.

Quantitative Measures

All participants completed a questionnaire at the beginning of the study that collected demographic data, as well as information related to students' prior educational backgrounds and previous experiences of being identified as high achievers. Students self-reported whether they had entered university directly from school or entered via the special admissions program. In New Zealand, anyone over the age of 21 can attend a university, but if they have not gained automatic entry from high school, most enter a special admissions program to prepare them for university-level study. The questionnaire also measured student motivation, grit, self-concept, and self-regulation.

Motivation. Motivation was measured using the Academic Motivation Scale (AMS; Vallerand, Blais, Brière, & Pelletier, 1989). This scale has adequate reliability (α = .81) and measures student intrinsic, extrinsic, and amotivation in relation to why the student attends a university. Intrinsic motivation is measured using three subscales: intrinsic motivation to know, intrinsic motivation toward accomplishments, and intrinsic motivation to experience stimulation. Intrinsic motivation to know relates to student curiosity and intrinsic intellectuality, (e.g., "Because I experience pleasure and satisfaction while learning new things"). Intrinsic motivation toward accomplishments relates to student mastery of skills and wanting to feel competent, (e.g., "For the pleasure I experience while surpassing myself in my studies"). Intrinsic motivation to experience stimulation relates to engaging in an activity in order to experience sensations such as sensory pleasure, excitement or fun, (e.g., "For the pleasure that I experience when I read interesting authors"). Extrinsic motivation also consists of three subscales: external regulation, introjection, and identification. External regulation relates to behavior engendered through external sources such as rewards and controls, (e.g., "In order to obtain a more prestigious job later on"). Introjected regulation relates to students being motivated to perform in a particular way based on

previous experience, (e.g., "To prove to myself that I am capable of completing my university degree"). Identification is regarded as the highest form of extrinsic motivation and relates to the student internalizing his or her extrinsic motivation, (e.g., "Because eventually it will enable me to enter the job market in a field that I like"). Finally, amotivation measures feelings of lacking competence and controllability, (e.g., "Honestly, I don't know; I really feel that I am wasting my time at [the] university"). There are four items for each subscale measured on a 5-point Likert scale ranging from 1 = Does not correspond at all (to me) to 5 = Corresponds exactly.

Grit. The Grit Scale (Duckworth, Peterson, Matthews, & Kelly, 2007) contains 12 items that measure student long-term interest in, and effort towards, goals. The Grit Scale has good internal consistency (α = .85) and has been shown to predict success in academic areas over and above measured intelligence. The Grit Scale contains items that relate to long-term interests (e.g., "I often choose a goal but later choose to pursue a different one" reverse scored) and perseverance (e.g., "I have overcome setbacks to achieve an important challenge"). All items on the Grit Scale were measured in a 5-point Likert scale ranging from 1 = Does not correspond at all to 5 = Corresponds exactly.

Self-concept. Self-concept was measured by including the mathematics, verbal, problem solving and academic subscales of the Self-Description Questionnaire III (SDQ-III; Marsh & O'Neill, 1984) designed to measure student self-concept at the tertiary level. Each subscale has 10 items, with 5 items worded positively and 5 negatively. The scale has good reliability (α = .89). Mathematics self-concept relates to perceptions of competence in mathematics, (e.g., "I find many mathematics problems interesting and challenging"). Verbal self-concept relates to perceptions of competence in language skills, (e.g., "Relative to most people, my verbal skills are quite good"). Problem-solving self-concept relates to perceptions of competence with solving problems, (e.g., "I enjoy working out new ways of solving problems"). Finally, academic self-concept concerns ideas about all academic subjects, (e,g, "I am good at most academic subjects"). All items on the SDQ-III were measured on a 6-point Likert scale ranging from 1 = False to 6 = True.

Qualitative Measures

Two forms of qualitative data were collected. First, data were collected during individual semi-structured interviews with students. The interview questions were designed to explore more deeply the psychosocial characteristics of the high-achieving participants. One example is, "What are the factors that have enhanced/hindered your learning experiences?"

Table 1
Coding Themes

Enhancing psychosocial factors	Limiting psychosocial factors
Optimal motivation	Low motivation
• Increased self-efficacy	• Hated school, left as soon as possible
• comes with success	• Failed preferred course entry
• Scholarships applied for	
• Taken leadership role	
Productive mindset	Unproductive mindset
• Vision for a better future	• Just leave school and have a family
Developed psychological strength	Low level of psychological strength
• Resilience	• It was just too hard
• Grit	
• Hard working	
Developed social skills	Poor social skills
• Organizational skills	• I just didn't fit in socially
• Collegial collaborative work ethic	

Enhancing chance factors	Limiting chance Factors
Educational enhancers	Educational delimiters
• Identified as gifted and offered extension pathways	• Negative school experiences
• Great lecturers/tutors	• Early exit from school
• Positive peer group support	• Bullying
• Second option opened new opportunities and interests	• Transience
• University Entrance qualification	• Low teacher expectations
• Loved school – positive school experiences	• Boring course content
• Previous positive tertiary experiences	• Failed entry into course of choice
	• Lack of challenge
	• Part time study
Financial enhancers	Financial delimiters
• University Scholarships	• Living in or from low Socio- economic group
• Student loan scheme	• Children to support
• Student allowance	• Need to work whilst studying
• Affluent parents	• Mortgage to pay
• Paid employment	
Social enhancers	Social delimiters
• Positive family influences	• Unsupportive parents
• Positive prior work experiences	• Unsupportive partner
• Positive overseas travel and work experience	• Abandoned by parents
	• Abusive relationships/ environment
Cultural enhancers	Cultural constraints
• Strong identification with ethnic origins	• Under-represented group (Female, mature aged, ethnic minority, special admissions pathway)
• Speaker of Te Reo (Maori) or other language of ethnic origin	
• Not first in family to attend university	• First in family to attend university

A follow-up focus group assessed students' perspectives of the value of the project. In addition, a follow-up survey from a random selection of participants ($n = 27$) collected data on the detail of participation in the program, opportunities, and their worth.

Procedures

Permission to conduct the study was obtained from the Human Participants Ethics Committees of each institution. The program was then introduced to talented undergraduates who agreed to participate. The program remained as in Phase 2, that is, students were sent a congratulatory letter, and they were invited to attend a celebratory morning tea, to attend seminars and postgraduate workshops, to act as mentors for other undergraduate students, and to apply for summer scholarships to work alongside an academic on a research project. Interviews were carried out once the program was underway, and the focus group was conducted following completion of the project.

Data Analysis Design

Means were calculated for the quantitative measures, and, using independent *t*-tests and ANOVAs, these were examined for specific groups to ascertain differences. Means were also used to examine the responses of participants compared with the original means developed for each scale where these were available. This enabled comparison between our high-achieving tertiary group and groups of students who were participants when the scales were originally employed. This methodology was selected because the study was cross-sectional, and so there were no other groups in the study with whom the questionnaire responses could be compared. Comparing the results with the groups involved in the original scale validation provided some basis for determining whether the participants had means that were similar to, above, or below those of the original groups and, therefore, could provide some indication of which psychosocial variables may be worth fostering in other students.

The qualitative data were analyzed using a theoretical framework developed from Subotnik et al. (2011) that identified enhancing or delimiting psychosocial or chance factors that participants perceived affected their participation and performance in their undergraduate studies. A coding framework was developed from this theoretical framework. Two broad themes—enhancers and delimiters to talent development—were identified, and these were further divided to identify psychosocial or chance factors that impacted talent development (Table 2).

Results

Quantitative Analysis

The quantitative data were analyzed in two ways. First, where possible, the means for our sample were compared with the means in original validation studies for each instrument. This enabled us to assess whether or not our participants held differing beliefs from those in the original validation studies. That is, the beliefs of high-achieving students were able to be compared with other groups of students who were not necessarily high achievers. Second, we examined our data by comparing groups within our sample in order to see if there were differences in beliefs between specific groups.

Comparisons with Means for the Original Validation Studies

Where means were provided for the original scales, independent *t*-tests were calculated in order to determine differences between the students in the current study and those in the validation studies. Means and standard deviations for those scales for which they were available and for the current sample may be found in Table 2.

In terms of motivation, there was a statistically significant difference between the two groups for amotivation ($t = 5.44$; $p < .001$), introjected regulation ($t = 7.66$; $p < .001$), identified regulation ($t = 18.27$; $p < .001$), intrinsic to know ($t = 19.01$; $p < .001$), intrinsic to accomplish ($t = 12.79$; $p < .001$), and intrinsic for stimulation ($t = 10.12$; $p < .001$). There was no statistically significant difference between the groups for external regulation. For all statistically significant differences, the means for the high-achieving students were greater than those of the original samples, and, particularly for intrinsic motivation, these differences were large. Hence, the talented students were more amotivated, more extrinsically motivated (introjected and identified regulation), and much more intrinsically motivated than the students in the validation studies.

In relation to the 12-item Grit Scale, Duckworth et al. (2007) provided means for several groups used in the validation of the scale. We used the group mean from Duckworth et al.'s study that most closely reflected our high-achieving group, Ivy League undergraduates. The students in Duckworth's study scored in the top 4% of undergraduates entering their university and hence were similar to the students in the current study. There was a statistically significant difference in grit scores for our participants compared to the Ivy League undergraduates, ($t = 4.87$; $p < .001$). Our participants showed higher levels of grit than the original sample.

Table 2
Means and Standard Deviations for a Contrast Group and the Current Participants

Scales	Contrast group		Current sample	
	M	*SD*	*M*	*SD*
Amotivation	.95	.58	1.17	.45
External regulation	3.11	.72	3.17	.99
Introjected regulation	2.42	.83	3.17	1.09
Identified regulation	3.13	.54	4.19	.64
Intrinsic motivation– knowledge	2.81	.54	4.09	.75
Intrinsic motivation – accomplishment	2.39	.74	3.55	1.01
Intrinsic motivation- stimulation	1.86	.79	2.76	.97
Grit	3.46	.61	3.67	.48
Mathematics self-concept	3.94	1.22	3.87	1.19
Verbal self-concept	4.13	.79	4.62	.74
Problem solving self-concept	4.03	.69	4.20	.75
Academic self-concept	4.19	.76	4.84	.65

The third component of the questionnaire related to mathematics, verbal, problem solving, and academic self-concept (Marsh & O'Neill, 1984). Means were not provided in Marsh and O'Neill's (1984) article, so we were unable to compare the means from that study with our own. However, in another New Zealand study (Rubie-Davies & Lee, 2012), a random sample of 929 undergraduate students completed the SDQ-III. Hence, because the students were New Zealand undergraduates, we used their means to compare with the current sample. There were statistically significant differences between the two groups for verbal self-concept ($t = 7.377$; $p < .001$), problem solving self-concept ($t = 2.52$; $p = .006$) and academic self-concept ($t = 11.14$; $p < .001$). There was no statistically significant difference between the two groups for mathematics self-concept. In all instances of statistically significant difference, the means for the current group were higher than those in the Rubie-Davies and Lee study (2012).

The final scale was the SRQ (Miller & Brown, 1991). Miller and Brown did not provide means and standard deviations in their validation document. They did provide ranges that indicated high, medium, and low levels of self-regulation. According to their criteria an overall mean of 4.38 for our group of students would indicate medium levels of self-regulation.

Overall, through examining the means for this high-achieving group versus those for students in the original studies, the psychosocial characteristics of high-achieving students were revealed. The high-achieving students showed more extrinsic motivation than the contrast groups and were more intrinsically motivated on all scales. They also showed more grit even though the validation group was also high-achieving. Further, the high-achieving group had more confidence in their verbal, problem-solving, and overall academic abilities than a random sample of New Zealand tertiary students.

Comparisons by Group

A series of one-way analyses of variance (ANOVA) were carried out in order to ascertain any demographic differences among the high-achieving students. Where there were more than two groups, post hoc Tukey tests were employed: Tukey HSD tests where group numbers were similar and Tukey-Kramer tests where the group numbers were unequal. Because a large number of tests were carried out across the 13 factors from the four scales, only those that were statistically significant are presented below. Some caution is needed in the interpretation of the results given a large number of tests on the same data and the increased probability of a Type I error. Because of the possibility of a Type 1 error being responsible for statistically significant differences rather than any true differences in the data, effect sizes were also calculated. Effect sizes using Cohen's *d* provided an indication of the meaningfulness of the difference between means as defined by Cohen (1988, p. 22).

Sex. There was a statistically significant difference between males and females for academic self-concept ($F(1,122) = 5.69$, $p = .02$, $d = .65$) and problem solving self-concept ($F(1,122) = 5.53$, $p = .02$, $d = .65$). In both cases the differences were large. Males showed higher levels of problem-solving and academic self-concept.

Ethnicity. Because the numbers of Māori (the indigenous group) and Pasifika students (those originating from the Pacific Islands) were low, their data were combined for the purposes of analyses. Similarly, the group "Other" was combined with the Asian group. There were no statistically significant differences in the self-beliefs of students by ethnic group.

Age. Students' beliefs were compared by age group bracket (<20 years, 20-26 years, >26 years). There was a statistically significant difference between

the oldest and youngest students in terms of external regulation (F (2,122) = 5.62, p = .005, d = .71). The post hoc Tukey test showed that the youngest students were more externally regulated than the oldest students (p = .007), and the effect size was large.

Admission. Student beliefs were compared by admission criteria. Students who gained entrance to the university through school achievement showed more external regulation than students who came in through the special admissions program (F (1,111) = 7.61, p = .007, d = .58). Conversely, special admissions students scored more highly on the grit scale than did those who entered the university through their academic achievement (F (1,111) = 4.74, p = .03, d = .49). Both these differences constituted a medium effect size.

Program. The beliefs of students depending on their program (education, science, conjoint/other) were compared. There was a statistically significant difference in intrinsic motivation to accomplish (F (2,120) = 3.62, p = .03, d = 1.06). The post hoc test showed that this difference was between the conjoint and science students (p = .02). Conjoint students were far more motivated by accomplishment than were the science students, and the effect size was very large. There was also a statistically significant difference between the groups in amotivation (F (2,120) = 5.24, p = .007, d = .57). The science students were more amotivated than the education students (p = .005).

University sites. Students' beliefs were compared according to the university they attended. There was a statistically significant difference between the groups for amotivation (F (2,119) = 3.62, p = .03, d = .51). The students from the science department were more amotivated than the students from the large education department (p = .03), and the effect size was medium. However, particular caution is needed in interpreting this result since it is more likely a reflection of the different programs that the students in the science department (science and conjoint) were enrolled in, as compared to those from education.

Semi-Structured Interviews

The 55 interview transcripts were coded using a framework developed from Subotnik et al.'s (2011) model of talent development (Table 1). The transcripts were independently coded by two research assistants who had not been involved in the data gathering process. Twenty-three transcripts were coded by both research assistants, and 100% agreement was reached regarding coding according to enhancing and delimiting chance and psychosocial factors (Table 3).

Enhancing Chance Factors

Participants from the education departments frequently mentioned family as important in either supporting or driving their learning: "And my children are absolutely ecstatic. They are so proud of me and really encouraging. And it's like I can't let them down now."

The students from all three sites mentioned the positive impact of lecturers, tutors, and having a study plan as factors that enhanced their learning: "Most of the lecturers will let you talk to them whenever you need help. You just email them and most of them will email you back real fast." Peer mentoring opportunities at the science department were acknowledged as supporting participants' own learning:

But one of the things I enjoyed about one of my peer mentoring classes was one aspect of first year chemistry I struggled with, but I remembered how I best learned it so I tried to teach it the same way to them …., and I felt really good about that.

Delimiting Chance Factors

Factors that were described as limiting success were diverse.

Participants from the education departments noted the lack of family support and financial constraints: "... [M]y mum wasn't there; she had left when I was eight and I thought she would come back; she didn't come back so we [me and my sister] just raised ourselves."

Another student was a mother who worked 35 hours per week in two part-time jobs, as well as studying full-time. Participants also mentioned institutional factors they believed hindered their learning. Examples from the two education departments included repetition of course content, lack of feedback on their assignments, the experience of being let down by their peers in group assignments, and feelings of isolation in a very big institution. Participants from the science department mentioned having too many assignments due in the same week, large class sizes in the first year, lecturers who were not able to teach effectively, and "partying too much."

Table 3
Number of Coded Chunks of Interview Text

Enhancing factors		Delimiting factors	
Psychosocial factors	Chance factors	Psychosocial factors	Chance factors
331	265	62	166

Enhancing Psychosocial Factors

Possessing optimal motivation, grasping opportunities, having a productive mindset, and developing good social skills were attributes displayed by all of the participants. Students from all sites described themselves as hardworking and resilient with high expectations of themselves:

I have high expectations of myself. I am a conscientious person who loves learning new things. I love getting A's. I enjoy exams. I like a challenge. I put in the hard yards.

Attitudes such as these were sometimes in contrast to their pre-tertiary experiences, for many of the high-achieving students' stories were previously shaped by feelings of failure. Many of the students from the education departments had left school prematurely before completing university entrance qualifications: "I didn't finish 6th form [Grade 11], I left to do home schooling." Others had attempted a tertiary qualification, but had not completed it: "I'm a mature student. So I have a family. I have two children at primary [elementary] school. I'm married. I attempted a degree when I was 18. I deferred in my third year." All of the students from the science department had achieved university entrance at school. Half of the students had completed a pre-specialist year of study, but they had not gained sufficient marks to continue in the highly competitive specialist field of study. The majority of these participants were completing a double major and were enrolled in either the second or third year of a four-year degree: "I'm doing zoology and ecology at the moment; I tried to do [specialized course] last year and missed out by like point three, which is a bit gutting."

These comments support the findings of the quantitative data which showed that high-achieving tertiary students in the current sample showed resilience and grit in setting and achieving their long-term goals, enabling them to persist and achieve success in the tertiary academic environment. Further, the students also seemed highly motivated to complete their current academic studies with high grades.

Post-Program Focus Group

"Recognition" was most appreciated by this group; they commented that the letter they received acknowledging their high achievement had kept them striving to achieve. Their families also appreciated the program. One student reported submitting four late assignments after her Poppa died and that her mother was concerned that she may be dropped from the program as a result. The participants described feeling more comfortable about seeing themselves as "top achieving students." Their identification as such reinforced their self-belief, and they reported that they were now more willing to share work and help others. Focus group participants believed that the program had built collegial relationships within the course: "So I think it was interesting seeing other people who also had a personal like intrinsic motivation to want to do well."

Following their involvement in the study, most had begun to think about postgraduate study. One student completing her undergraduate program had already enrolled for an Honors degree, and she said, "The interview [in the study] was the deciding factor."

Post-Program Survey

A small group of randomly recruited participants (*n* = 27) responded to a final survey to evaluate the program. This provided a means of verifying responses from the focus group. Participants were asked if they had enjoyed their involvement in the study; 96.3% responded that they had. Participants were asked if they had attended any of the professorial addresses or seminars. Only 27% had taken advantage of this opportunity: "I found these to be motivating and encouraged me to think of what else I want to achieve, and where I see myself in the future." Students were asked whether, as a result of the program, they were now intending to continue to postgraduate study, and 76.2% agreed: "I plan on completing my masters specializing in an area such as dyslexia, gifted and talented-ness, twice exceptionalism. I want to move into the area of research and specialist programs at some time in my career."

Discussion

This paper explored the characteristics of high-achieving students and investigated whether a low-cost program was associated with positive benefits for students. Both the quantitative and qualitative data suggested that the high-achieving students were highly motivated, (particularly in regards to intrinsic motivation) and showed high levels of grit. Males also reported higher levels of problem solving and academic self-concept than females. These characteristics provide some clues as to the types of social-psychological traits that should be being fostered in universities in order to encourage success among all students.

Overall, the quantitative data showed that the high-achieving students were highly motivated intrinsically, characteristics which are likely to lead to them putting regular effort into their studies (Vallerand, Blais, Briere, & Pelletier,1989). The qualitative data showed

that they were keen to learn and to master skills and that they gained pleasure from learning. They viewed a university qualification as a means of entering their chosen profession. The qualitative data also showed evidence of many participants having overcome significant personal difficulties. The students themselves reported being conscientious, having high expectations of themselves, and enjoying the challenge of learning. Interestingly, the quantitative data showed that amotivation was higher among these students than among the sample used for validating the scale (Vallerand et al., 1989). Several of the science students had entered the university with the intention of studying a particular specialist course, but having completed a preliminary first year, had not achieved the necessary grades in order to continue in the course. It may have been that these students had become amotivated as a result; they were unable to pursue their original goal, and so they may have been unsure of an alternative career. This was reinforced by the finding that science students were higher on amotivation as compared with education students.

The students reported high levels of grit—higher even than found for Ivy League students in the United States (Duckworth, et al., 2007). Several of the education students were mature students who had entered their course via the special admissions program and these students showed higher levels of grit than their younger counterparts who entered university directly from school. For many of these students, their enrollment in their teacher education program was a second chance and may have led to high levels of determination to complete their courses. Several reported their desire to make a difference to their families' lives and the pride that their success was engendering in their families. A desire to please their families, coupled with high grades, may have fostered strong ambitions to continue their success. Further, many of these students reported not having achieved at high levels in their previous schooling; some had been in tertiary education several years previously. Many experienced debilitating chance factors, yet somehow managed to develop sufficient resilience and determination that enabled them to achieve within the top 10% of their cohort despite ongoing challenging personal circumstances. These participants demonstrated strong psychosocial self-beliefs: they grasped opportunities, had strong self-beliefs, exhibited good social skills, and displayed optimal motivation (Subotnik et al., 2011). Many had set themselves challenging long term goals and were striving to maintain very high levels of achievement despite the existence of limiting chance factors. Conversely, the youngest students who entered university directly from school demonstrated higher levels of external regulation than the more mature students who came through the special admissions program. It seemed that the younger students were more

interested in moving into a well-paid, prestigious job following graduation. The older students were more focused on making their families proud and on making a difference in their communities. These results point to the need to foster student motivation (particularly intrinsic motivation), determination, and self-belief in order to increase achievement among all students.

A further finding from the quantitative data was that male students reported higher levels of academic and problem-solving self-concept. Similar findings have previously been reported among adult males compared to females, and Marsh (1989) proposed that these differences reflected gender stereotypes. It is important that at the tertiary level, teachers need to be aware of possible gender stereotyping, especially in the STEM (science, technology, engineering and math) fields where females are underrepresented and are often not made welcome (Xu, 2008).

A second purpose of the study was to evaluate students' perceptions of the effectiveness of the program. Although the program was easy to implement and was low-cost, it was important to determine if students had found it useful in contributing to supporting their studies. Multiple benefits were reported by the participants. The most highly appreciated aspect of the program was the simple recognition of their high achievement, as this was not something they felt had been acknowledged previously at the tertiary level. These findings support the findings from Phase Two (Millward et al., 2016), where students expressed surprise at their identification as high-achieving. It appears that not only were staff unaware of who the high-achieving students were in their departments, but the students themselves were not aware of the extent of their own academic prowess.

Participants sought opportunities to continue to grow and develop, and they were keen to continue to be informed of departmental seminars. The seminars provided valuable opportunities for the most capable students to be exposed to leading edge research, again providing opportunities for talented students to grasp developmental opportunities (Subotnik et al., 2011) and also providing the students with exposure to postgraduate opportunities. These opportunities increase the developmental opportunities for students with high levels of motivation, grit, and strong self-belief, and we encourage university departments to consider them.

Mentoring other undergraduate students provided the high-achieving students with opportunities to consolidate their own learning in key academic areas. Using capable students in this way benefits undergraduate students and academic staff. The high-achieving students exhibited a strong drive to maintain and extend their performance (Subotnik et al., 2011) and requested more feedback from the academic staff

so they could continuously improve. This simple strategy of providing mentoring opportunities and possibly opportunities to be mentored was reported as being beneficial, and other university departments are encouraged to facilitate these opportunities.

Limitations

This study used grades to identify high-achieving students, but we acknowledge that other criteria for inclusion might be appropriate. The size and design of the study means it is not possible to attribute causation or generalize from the findings. The results showed that the education students often had quite different views to those of the science students, and this may also be the case with other university departments. The findings and the effectiveness of the program pertain most to departments or schools where currently no assistance is offered to support high-achieving students.

Conclusion

Overall, it appeared that the program was appreciated by participants and encouraged them to consider future postgraduate study. The success of this program, first across one institution and now across three, signals its viability and usefulness. Departments in other universities may find this program a low cost, effective strategy in identifying and providing support for their high-achieving undergraduate students.

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"In All Honesty, You Don't Learn Much": White College Men's Perceptions of Diversity Courses and Instructors

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The positive effects of diversity coursework on college students are uncontested and the majority of institutions now require some form of diversity content. However, not all students engage in this content in the same way, and heterosexual White male students may show ardent resistance to diversity courses and the faculty teaching them. Faculty of color disproportionately teach diversity courses, and some White faculty may avoid teaching about topics of human difference altogether. This article shares the results of a phenomenological study with 92 undergraduate White heterosexual male participants at 10 institutions throughout the United States. Data analysis reveals participant perceptions of the lack of depth in required diversity courses, of the need to weave diversity throughout the major course of study, and of the skills and behaviors of faculty teaching diversity content. Recommendations to incorporate the teaching of diversity and pedagogical strategies for faculty are offered.

The vast body of research on the effects of college student engagement with diversity makes an unequivocal assertion: diversity courses, programs, and discussions positively influence student outcomes (Chang, 2002; Nelson, Engberg, & Hurtado, 2005; Parker, Barnhart, Pascarella, & McCowin, 2016). Faculty are among the main socialization agents of college students, and, generally speaking, college students respect professors and work diligently to meet faculty expectations (Astin, 1993; Kuh, Nelson Laird, & Umbach, 2004; Pascarella & Terenzini, 2005; Umbach & Wawrzynksi, 2005). Faculty who teach diversity courses do most important work. They challenge college students with privileged identities to interrogate unearned privileges while providing an environment that validates the experiences of students from traditionally underserved groups (Branche, Mullenix, & Cohn, 2007; Charbeneau, 2015).

A growing subset of research suggests that White and male students also benefit from their engagement in diversity initiatives (Hu & Kuh, 2003; Hurtado, 2005; Spanierman, Neville, Liao, Hammer, & Wang, 2008), perhaps often at greater rates than women or students of color (Engberg, 2004; Sax, 2009). However, White students (Strayhorn & Johnson, 2014), and especially White college men, are also least engaged in diversity initiatives on campus among any racial, ethnic, or gender group (National Survey of Student Engagement, 2014). White men also resist diversity education in college classrooms more vehemently than any other student group (Heinze, 2008; Schueths, Gladney, Crawford, Bass, & Moore, 2013; Vaccaro, 2010). White male collegians often feel excluded from, or frustrated by, diversity efforts, indicate diversity is not about them, and perceive they have nothing to contribute to diversity conversations (Banks, 2009; Roper, 2004). Required diversity courses are often the only form of diversity education for heterosexual White men because of their low level of engagement in any other campus diversity initiatives. Yet, little research exists about their perceptions of such coursework and about the faculty teaching such content (Plaut, Garnett, Buffardi, & Sanchez-Burks, 2011).

White men are also the most privileged of any social group in United States society (Feagin & O'Brien, 2003). On college campuses, White men are more often the originators of unacceptable behavior, including social, racial, gender, and sexual discrimination and violence (Harper & Harris, 2010; Harper & Hurtado, 2007). This presents a major dilemma: despite substantiated benefits stemming from engaging in diversity initiatives and interacting with faculty in such contexts, heterosexual White college men may not participate in diversity initiatives beyond low-level or general education diversity requirements. If they do not, college educators will continue to struggle to challenge White male students' understanding of privilege and oppression, to activate their responsibility for social change, or to dissuade them from engaging in inappropriate behavior. In higher education today it is plausible that too many heterosexual White men experience 4 to 6 years of college without gaining enough critical knowledge and skills relative to diversity, inclusion, equity, and social justice. Should this trend continue, consequences will not only be dire for the campus climate of their institution, but also for society when these men hold or share positions of significant social influence throughout their careers (Feagin & O'Brien, 2003).

The purpose of the present phenomenological study was to explore the perceptions of 92 heterosexual White college men at 10 U.S. institutions about diversity initiatives, courses and co-curricular programs, and faculty teaching diversity courses on their campus. White college men have the ability to either create positive or negative campus climates for faculty, staff, and peers with marginalized identities. Studying the perceptions of those college students with the most social privileges is

essential in improving campus climates, redesigning academic and out-of-class curricula and programs, and redevising services for oppressed and privileged students.

Literature Review

Effects of Required Diversity Courses

Enrollment or engagement in curricular or co-curricular activities brings about positive change in college students (Chang, 2002; Harper & Yeung, 2013; Hurtado, 2005). Specifically, diversity courses positively affect students' moral development and reasoning (Hurtado, Mayhew, & Engberg, 2012; Parker et al., 2016), and they raise student racial awareness (Cole, Case, Rios, & Curtin, 2011; Soble, Spanieman, & Liao, 2011), civic-mindedness (Cole & Zhou, 2014; Denson & Bowman, 2013), engagement in social action (Nelson Laird et al., 2005), and development of White empathy (Spanierman et al., 2008).

Most institutions are now requiring such coursework or programs of their students, at least in general education arenas. A number of studies have examined the effects of required college diversity courses on student outcomes; however, few report the perceptions of, or attitudes of, students about having to take the required course (Littleford, Ong, Tseng, Milliken, & Humy, 2010; Plaut et al., 2011). Generally, students who completed required diversity courses displayed more favorable attitudes toward human difference than those students who had not completed the coursework (Chang, 2002). Of the nearly two-thirds of institutions who have established diversity coursework, nearly 70% require their students to take at least one course in this area (Perry, Moore, Edwards, Acosta, & Frey, 2009). Fuentes and Shannon (2016) studied more than 200 individual psychology courses across the U.S. for diversity content. While most of their research sites required some kind of diversity course in general education, most psychology programs did not require diversity content in the major.

Research focusing on the effects of diversity efforts on White college students also suggests positive outcomes. White students' engagement in diversity initiatives results in more openness and appreciation of human differences, as well as increased awareness of racial privilege (Harper & Yeung, 2013; Hurtado, 2005; Spanierman et al., 2008). White students who engaged in deeper diversity initiatives, such as intergroup dialogue sessions, increased their development as social justice advocates (Alimo, 2012; Reason, Roosa Millar, & Scales, 2005). White students who took more diversity courses or who participated in more diversity activities reported a significant reduction of colorblind ideology over time than their less-engaged counterparts (Neville, Poteat, Lewis, & Spanierman, 2014).

How do diversity initiatives affect men specifically? Sax's (2008) research on the gender gap in college suggests that men, compared with women, display more problematic academic behaviors, such as coming late to class, not completing work, or reporting boredom. However, Sax (2009) also suggested that men reap greater benefits than women from time spent studying, working on assignments, and preparing for class. Men who expended more energy towards their studies became more interested in larger political and cultural contexts, which is not true in the same way for women (Sax, 2009).

Once involved, men perceived engagement with formal and informal diversity experiences more liberalizing, motivating, and awakening than women (Sax, 2009). Diversity workshops and ethnic studies courses contributed more strongly to men's commitment to improving race relations and to adopting more progressive attitudes toward gender roles. Diversity coursework also increased political interest and liberal social and political views among men as compared to women (Sax, 2009). More personal experiences or interactions across difference—such as dating, dining, or studying—with someone from a different racial or ethnic identity furthered men's commitment to social activism and desire to improve race relations.

Despite the positive outcomes men can realize from engaging in diversity courses or programs, scholars have found that White college men often either feel left out of or frustrated by diversity initiatives (Plaut et al., 2011; Roper, 2004). White college men do not regularly engage in diversity initiatives willingly (Vaccaro, 2010), actively resist explorations of diversity and social justice inside or outside of the classroom (Bondi, 2012; Heinze, 2008; Johnson, Rich, & Cargile, 2008), or suggest they do not contribute much to diversity on campus (Banks, 2009). Vaccaro (2010) found an alarming level of White male resistance to diversity efforts in her campus climate study at a large Eastern U.S. university. Respondents refused to have deep dialogue about diversity, found diversity efforts unnecessary or discussed too frequently on campus, or threatened to withdraw financial support as alums if the institution continued to foster diversity (Vaccaro, 2010).

Not in all cases will Whites ardently resist diversity initiatives and education; however, they may purport not to need additional training or development in issues of power, privilege, and oppression because they perceive themselves as progressive and anti-racist. White fragility, or the lack of stamina for racial issues, is an attitude or behavior educators should consider as a form of White resistance to topics of power, privilege, and oppression (DiAngelo, 2011). When engaging in diversity coursework, many Whites may expect the same kind of racial comfort they are afforded in society: comfort that prevents the challenge of engaging in critical content on issues of privilege and oppression.

Table 1
Research Sites

Institution (Pseudonym)	Region	Type	Affiliation	Undergraduate Enrollment	Percent White Undergraduates
Callahan College	Midwest	B	Private	2,000	66%
Lakeside State University	Midwest	M	Public	10,000	85%
Lucas College	Midwest	B	Private	2,500	85%
Mason College	Midwest	B	Private	2,000	66%
Midwest University	Midwest	D	Public	36,000	74%
Mountain State University	West	D	Public	30,000	75%
Riverside State University	Midwest	M	Public	10,000	89%
St. Margaret University	West	D	Private	6,000	49%
University of Danbury	Midwest	B	Private	1,700	67%
University of Southern State	South	D	Public	15,000	70%

Such security should not be a given in courses interrogating centuries of American oppression at the hands of Whites and their cultural ancestors.

Perceptions of Faculty Teaching Diversity Courses

Scholars have posited for decades that faculty are of key importance in the socialization of college students (Astin, 1993; Kuh et al., 2004; Pascarella & Terenzini, 2005). Faculty who teach diversity courses are often instrumental in challenging privileged students to consider different perspectives while creating an environment in which students with underserved identities may feel validated (Brayboy, 2003; Charbeneau, 2015; Heinze, 2008; Larke & Larke, 2009). However, compared to White instructors, faculty members of color are also disproportionately assigned to teach required general education multicultural or diversity courses (Schueths et al., 2013). Because of the heightened emotional response diversity content brings about in students and faculty, this growing trend typecasts and burdens faculty members with already marginalized identities and threatens their institutional and career livelihoods.

Moreover, students often evaluate professors who teach diversity courses more harshly than their White or male professors, specifically faculty who identify as women or people of color (Littleford et al., 2010; Schueths et al., 2013). Students with privileged identities have challenged, often vehemently, the authority and competence of faculty who have discussed race, privilege, and oppression in diversity courses (McGee & Kazembe, 2015). White students specifically tend to not value content that interrogates their self-professed nonracist identity or their beliefs in a meritocratic society (Boatright-Howowitz & Soeung, 2009; Littleford et al., 2010; Perry et al., 2009). Students may also perceive that faculty operate with bias or self-interest (Czopp & Monteith, 2003) or that they have inadequate training or knowledge in diversity content matter (Lim, Johnson, & Eliason, 2015). For instance, students presume African American instructors who discuss racism do so primarily because they are motivated by self-interest (Littleford et al., 2010). In general, male faculty include diversity topics in their courses less frequently than women or faculty of color (Nelson Laird, 2011), and faculty with predominantly privileged identities may actively resist multicultural education altogether (Ukpokodu, 2007). Such instructors may engage in a process Schueths and colleagues (2013) have coined "ducking diversity"; that is, White male and female faculty purposefully avoid diversity discussions in their courses; yet, the majority of their students do not evaluate this conscious exclusion of critical content poorly. That is, White male and female faculty often get away with not engaging topics of diversity in their courses.

Method

A constructivist epistemology grounded the present phenomenological study assuming that individuals seek to understand the world in which they live through subjective and lived experiences. According to Charmaz (2006), qualitative studies explore participants' experiences in their natural settings, in this case college students from a variety of privileged and minoritized identities on their individual campuses where they experienced encounters with the phenomenon of diversity.

Research Sites

Ten four-year institutions of higher education served as the research sites. Table 1 shows their pseudonyms, region, type, affiliation, undergraduate enrollment, and percentage of White and male students. All institutions were predominantly White and mostly female-identified. Most U.S. regions are represented in the study, but because of cost restrictions, the majority of the research

Table 2
Sample Demographic Information

	Heterosexual White Men (n = 92)
Age (Mean)	21.3
Contact (Hours/ Week)	5.52
Intramurals (Percent)	62%
Arts (Percent)	12%
Student Organizations (Mean)	1.2
Campus Job (Hours/ Week)	5.4
Office Hours (Hours/ Year)	7.2
Diversity Programs (Mean of all Participants/Year)	1.7
Diversity Electives (Mean of all Participants/ Career)	0.6

sites were located in the Midwestern U.S. Midwest University (32,000) had the largest undergraduate enrollment and University of Danbury the smallest (1,700).

Sampling and Data Collection

The study used purposeful criterion sampling strategies (Patton, 2002). The author chose all research sites because colleagues worked for the institution and had access to undergraduate students. Participants needed to identify as White, heterosexual, and male students who were full-time undergraduates. By the end of data collection in July 2015, 92 heterosexual White men had participated in the study.

Focus groups were appropriate for the constructivist approach to the study. Due to time and resource constraints, the author did not employ any other forms of data collection. Focus groups are designed as a participatory model, allowing students to be active participants and to co-construct meaning rather than being subjected to a more hierarchical or power relationship with the researchers (Yakaboski, 2010). Incentives for focus group participation included $10 in cash for participants.

A team of four shared focus group moderation duties at the research sites. Each member moderated a focus group alone, which is appropriate for applied research (Fern, 2001). Team members included two heterosexual White male associate professors (Higher Education and Psychology), one biracial female-identified assistant professor (Higher Education), and one male African-American graduate student. All faculty had conducted and two had published qualitative research at the time of data collection, including employing focus group methods. All faculty involved had also taught research design, methods, or assessment courses in which qualitative methods were included. The graduate student had taken a research methods course from one of the faculty and received further training on focus group moderation and qualitative data analysis.

In qualitative research, scholars address, and are transparent with, their potential biases. Removing researcher bias entirely is impossible, but the research team took the following steps to address this bias. First, as Smithson (2000) suggested, the moderator and participants should come from similar identity backgrounds to avoid bias and engender the comfort and disclosure of student participants. The author identifies as a cis-gender, heterosexual, White man and conducted the vast majority of focus groups with heterosexual White male participants.

Second, before the focus groups started, the moderators instructed the participants about the nature and aim of the study, about wanting to hear different viewpoints, and about the participants' freedom to answer any question or to skip questions with which they felt uncomfortable. This likely helped to address potential groupthink or conformity to singular ideas, and the participants confirmed they understood the intentions of the researchers to study participants' lived experiences with the topic (Hollander, 2004).

Third, during the focus groups the moderators did not confront or correct participants' potentially racist, sexist, or homophobic language or behaviors. As Fern (2001) asserted, the moderator of a focus group must accept all responses and comments from all participants during data collection and analysis. Because each group was digitally recorded, the author considered each participant's comment for analysis.

Finally, the moderators did not keep any notes during the focus group interviews to concentrate entirely on the participants and their contributions. Note taking, while suggested as good practice by Krueger and Casey (2000), has the potential to alarm or unnerve participants; if the moderators take notes after a specific statement, participants may perceive the moderator disagreed, causing participants to withdraw from further participation (Yakaboski, 2010). Before each focus group began, participants completed an informed consent form and a brief survey assessing demographic and campus engagement data.

Table 2 displays the aggregated demographic characteristics of the sample. The author collected these

data to assess the diversity among the participants, as well as show their overall type of engagement in campus life. "Contact" describes how many hours per week participants estimated they spent in close personal interaction (longer than 30 minutes) with someone different than them (e.g., race, sexual orientation, ethnicity, religion). "Intramurals" and "Arts" capture the percentage of participants who engaged in athletic or artistic student activities at the time of data collection. "Student Organization" reports the average amount of registered student organizations in which the participants took part at the time of data collection. "Campus Job" refers to the average hours per week the participants worked on campus. "Office Hours" captures the average number of faculty office hours the students had visited over the past year. "Diversity Programs" reports the average number of diversity-related out-of-class activities the participants visited during the past academic year. "Diversity Electives" captures the average number of elective diversity courses in which the students enrolled beyond required diversity courses over their careers at their respective institution.

Focus groups ranged from 3 to 8 participants each, each group was digitally recorded and transcribed verbatim, and each lasted between 60 and 90 minutes. Responses to the following questions in the focus group protocol provided the data for this article: 1) How specifically does this institution teach you about diversity or social justice? 2) What do you learn from diversity courses, programs, or related experiences?

To ensure trustworthiness, the author performed member checks with participants (Lincoln & Guba, 1985). This involved inviting participants to review, authenticate, and critique a one-page document that included initial interpretations of the specific focus group data. All participants were invited to participate in the member checks and either agreed with the researchers' interpretations or did not reply. Additional trustworthiness strategies included maintaining an audit trail of all focus groups transcripts, focus group protocols, field notes, and memos written about interpretations (Lincoln & Guba, 1985). Audit trails "attest to the use of dependable procedures and the generation of confirmable findings" (Schwandt, 2001, p. 9).

Data Analysis and Reporting

Krueger and Casey (2000) suggested that data analysis of focus groups should follow a systematic and sequential process. While optimal focus group analysis develops among a team of moderators and debriefers, data emerging from focus groups analyzed by a single researcher are not inappropriate or invalid (Krueger & Casey, 2000). The graduate student team member and the author conducted the majority of the data analysis.

After each focus group was transcribed open coding commenced (Creswell, 2014) using Dedoose, a cloud-based qualitative data analysis software. The round of open coding aimed to discover expected and unexpected participant conceptualizations of diversity courses, requirements, and perceptions of faculty. After the open coding process was complete, axial coding (Creswell, 2014) involved categorizing the data into larger themes. Three distinct themes emerged from the coding process: 1) lack of depth in diversity requirements; 2) weaving diversity into the major curriculum; and 3) perceived White male shaming.

Limitations

Although this study is among a few to advance new knowledge on the perceptions of heterosexual White male college students' perceptions of required diversity courses and the faculty teaching such courses, it has some limitations. First, the perceptions reflected in the results are those of 92 undergraduate heterosexual White male students at 10 specific institutions. Hence, the transferability of results to other institutional or regional contexts should be approached with caution. Second, the participants represented less than 1% of all undergraduates at the 10 institutions. This means other students' conceptualizations of diversity coursework and faculty exist at the research sites, yet their voices do not emerge from this study. Third, focus group data are self-reported by the students who participate. The researchers do not have the ability to check each statement for accuracy, and it is possible the institution would present a different story. However, the stories told here are critical to the student participants and thus vital to be voiced in this paper.

Results

Lack of Depth in Diversity Requirements

The first theme describes participant perceptions of their institution's current diversity course requirements. Recall from Table 2 the demographic data of our participants which suggest that over their entire college career (71% juniors and seniors), on average the men enrolled in less than one diversity elective course beyond what they were required. At least for the participants this means that required courses are the only formal instruction on issues of diversity the students received. Additionally, not all institutions required diversity coursework from their students, and, as we will see from the participant comments, the content that fit under the general definition of diversity course was vague at some institutions.

When a research site instituted a diversity requirement, the offering was usually broad enough that "you could get all of your general education

requirements without having to take something that would deal strictly with social justice and diversity" (Dan, senior, Lucas College). The following conversation between the researcher and White heterosexual male participants at Callahan College, a very selective national liberal arts college, underscores the perceived lack of diversity requirements:

> Researcher: "So you don't actually have a diversity requirement in terms of the curriculum on this campus?"
> Mitch (Sophomore): "Nope."
> Trent (Senior): "Not at all."
> Researcher: "Not in general requirements?"
> Trent: "Nope."
> Abe (Junior): "We have an inter…"
> Mitch: "Well, we have lots of things like interdisciplinary psych, humanistic inquiry, all kinds of little subsets in classes [where] you will address diversity, but no class completely devoted to it. I actually think that's a good thing."
> Trent: "For me, the classes I used to fulfill those requirements, I took a lot of Russian. We don't talk about diversity in those classes, we talk about another culture."

This interaction hints at a problem in the way universities teach "diversity." Foreign language courses should not substitute for diversity or social justice content. A heterosexual White male student who learns how to speak Russian fluently may never learn basic awareness of power, privilege, and oppression in a U.S. context unless he is engaging directly in such content.

Beyond the apparent lack of focus on diversity content in required diversity courses, heterosexual White men shared thoughts about lack of challenge and depth in diversity coursework. Andrew, a junior at Midwest University, stated, "We [have] to take world culture classes…so I guess in that way you are exposed to other ideas. But I also feel like that's pretty minimal, how much you really interact with [diverse] people." Zane, a sophomore at Lakeside State University, indicated that diversity requirements vary in quality and challenge: "In all honesty you don't learn much, it's not really worth your money, you're not really challenged…I know someone who skipped like half the days, and they still passed." Colleges and universities can ill afford treating diversity in a way that signals to students, specifically students with primarily privileged identities, that power, privilege, and oppression are issues that deserve minimal time and effort, minimal course credit, and minimal engagement. In a way, this kind of peripheral treatment of diversity silences the voices of students, staff, and faculty who are historically marginalized on a specific campus and normalizes privileged and hegemonic White culture.

Lack of American diversity content in diversity courses was a topic of conversation during this focus group at Lucas College:

> Brian: "I would say in management, you're not sitting there and discussing like, 'This is how diversity affects your life.' It's more like, 'Here is a cultural norm in the managerial process in China, and here is why the roles of a high person in the corporation is different from a high person of a corporation in the U.S.' So, you get kind of some differences in that way. But it's not like you're sitting there and discussing what diversity means to you."
> Moderator: "But the overall consensus is that they don't do a great job within courses?"
> Dennis: "Yeah, I feel like even with the gen ed requirements there's not. You could get all of your general ed requirements without having to take something that would deal strictly with social justice and diversity."

To go along with the lack of focus on, or depth in, diversity courses at some of the research sites, participants shared their recommendations for anchoring diversity content inside the major program of study rather than in the general education curriculum.

Weaving Diversity into the Major Curriculum

The second theme, in a way, provides a solution to the dilemma unearthed in the first theme. The majority of all participants desired diversity courses as part of the curriculum in each major course of study, the only place on campus that enjoys the most captive audience. Students, once they have declared a major, will likely spend between 10 and 15 courses in that program, frequently interacting with the program faculty and smaller groups of peer students. In this setting, diversity coursework should be incorporated or required, thus supplementing the required courses in the general education arena. However, this in-depth treatment of diversity topics may not be occurring in the major program of study at some of the research sites: "I don't think there's any course I've had where we've talked about why understanding [diversity] is important for your major, or what you're going to get into later in life" (Brad, senior, Lakeside State University).

In a focus group of heterosexual White men at Callahan College, Mitch stated, "I think your challenge as a faculty member is to integrate diversity and not have the special 'Diversity Day.' You have to integrate it into the curriculum." How to incorporate such content in a specific major was a topic of discussion in a focus group at Lucas College:

If you had a class called Diversity or Diversity Awareness, not a lot of people are going to jump at that. But, for instance, if you were a Management major and it was Diversity Management: Working with a Diverse Workforce – tying it to something that's applicable or like [Tony] said, something that you're interested in, then I think a lot more people would be like, 'OK, I see how this relates to me now.' Being a White male, like we said before, we can choose to ignore this but if you frame the issue [as] something that's for me – you know, Managing a Diverse Workforce is something you're going to have to deal with – then I think people would be much more willing, and the key factor, interested [*emphatic*], in learning about that.

Because diversity coursework may, at face value, not appeal to most heterosexual White male college students, incorporating topics of human difference in major programs of study may be the best way to get them to engage in the topic in more depth and throughout their college careers, specifically if the outcome of the course is tied to career-related ends.

In most focus groups with heterosexual White male participants, incorporating courses into the major was a topic of vivid discussion:

> Researcher: "If [your] program said 'each year there is going to be a required diversity component,' you wouldn't worry about it?"
> Bill (senior): "I wouldn't pay for it."
> Researcher: "It's required for your major."
> Bill: "I'm going to a different school if I have to pay for that."
> Ron (senior): [to Bill] "No, it's part of your 120-hour plan basically."
> Researcher: "If it's part of your curriculum just like the courses . . ."
> Ron: "Instead of financial accounting you have to take a diversity class. It wouldn't be a big deal at all."
> Kyle (junior): "Yes, everyone would just take it."
> Researcher: "It's part of your major."
> Ron: "If…it's part of my major, it's a fact of life. [If] it's going to get you a job, you're going to take it

Like Bill, not all heterosexual White men may be excited to take diversity courses in the major, but very few would consider leaving their program of study to avoid or resist engaging in diversity content in the classroom.

This kind of utilitarian approach to diversity education may be a suitable way to engage more heterosexual White men in diversity content than they are used to; however, it also points to a problem. If diversity education in the major continues to be viewed only as a means to an end, college men will not necessarily engage in it more deeply than before the requirement. To realize the altruistic nature of learning about power, privilege, and oppression, college administrators and faculty have to communicate carefully the human and ethical obligations of engaging in diversity in the major and beyond the associated career-related promises.

Perceived Instructor Skills

The third theme describes participants' perceptions of the behaviors and pedagogical skills of faculty members and notes perceptions of apparent White male shaming. Some students perceived faculty of diversity courses as having low skills or not being committed to the course or the topic. Ron, a senior at Southern State University, enrolled in required diversity course focusing on "Native American Indians because I heard the professor was really easy." In a conversation with Jake, a senior at Lakeside State University, the researcher asked whether the perceived quality of the faculty member teaching the required course makes a difference to students. Jake responded, "Exactly, and that's why if we do make that course a 3-credit course you can't have the head football, [or] the head softball coach [teaching it], who are just here to coach those sports."

Several participants took issue with faculty whom they perceived as biased or opinionated. These perceptions likely came easier to men who disagreed with the faculty member or their apparent political or ideological disposition. Derek at St. Margaret was offended by one of his political science professors:

> I think I'm offended. When my Presidency [course] teacher says like, "Bush only won because Bible thumpers showed up and they don't know how to vote or they don't know that voting for the Democrats would actually help them more." I just get turned off. I'm like, "You realize there's bible thumpers in [my home state], we don't all just worship the word of God all day long, we actually have rational thoughts occasionally.

Faculty who didn't seem to be neutral in their approach or their pedagogy, our participants evaluated critically. Mel at St. Margaret University shared a story about a faculty member he perceived to be biased:

> With the classes I've taken so far, I've taken my history, my American Cultures, and theology. My history is just a history class, but my teacher was pretty biased. A White woman who was very adamant about African American rights. And then my American Cultures class, I had an Asian teacher and he was a great teacher, but he couldn't take his biases out of the curriculum.

What the participants considered instructor-generated "White male shaming" in diversity courses was a topic during several focus groups with heterosexual White male participants. Jon, a senior at Lakeside State University, shared such an experience in a required social stratification course: "[On] the first day, she basically just pointed out how if you are White, male, and middle class, you're a horrible person, because of all these different reasons." Jon felt "kneecapped right from the beginning." In the same focus group, Nate, a junior added, "Teachers need to be better, they are not properly trained, they're all opinionated. They're supposed to be teaching us how to be more diverse with our thoughts, with our actions. [But we] have a college professor yelling at [us]." Ben, a senior at Riverside State University, addressed an in-classroom encounter with a women's studies professor: "When you have a teacher who's bashing White people it becomes offensive…[My] teacher legitimately just hated men, or at least that was the impression I got. It made it unpleasant to go to class, and [I] didn't want to learn." In a different group at Riverside State, Max added, "I was leaving that class every day just annoyed, because the teacher basically bashed White males the entire hour. About how we're the cause of everything racist and wrong. She'd completely leave females out of it and just bashed us." A similar discussion on shaming took place at Southern State University when Mark, a junior, added this comment to a conversation with his peers: "[Shaming] doesn't encourage progress because you're always going to feel like you're doing something wrong. Instead of giving constructive criticism on what could be done, to just tell people what we did wrong in the past is counter-productive." The idea that today's heterosexual White male college students do not feel responsible for historic tragedies and a resulting sense of discomfort surfaced in most focus groups.

Discussion and Recommendations

The findings from this study point to three conclusions about the participants. First, not all institutions required diversity coursework in their general education courses, confirming extant research (Fuentes & Shannon, 2016; Perry et al., 2009). The majority of participants perceived diversity course requirements in general education courses to be of low quality where little deep learning takes place. If institutions require diversity coursework from students in general education realms, these courses must be challenging. Students who get the sense that the institution or the faculty do not emphasize the importance of diversity courses will likely not engage in-depth in the topic beyond the requirement.

Second, perhaps surprisingly to the reader and a bit paradoxical, the majority of the participants advocated for the inclusion of diversity into major programs of study. This would serve to make diversity initiatives specific to a course of study and a particular world of work and thus perhaps make it more relevant to students from traditionally privileged social groups. Especially heterosexual White men may want college educators to make the decision that diversity is important for them rather than having to choose between a diversity elective or another low-level requirement. They sense diversity is important but have not learned that it is indeed essential. Faculty, chairs, and deans should find ways to infuse diversity content in major-specific curricula, even in disciplines outside of the humanities, social sciences, or the arts. According to the participants, diversity must become part of discussions and experiences designed to benefit all students who graduate with a degree in a particular field.

Incorporating diversity content in all degree programs signals to important stakeholders that diversity is an essential value of the institution and of each discipline. Next, it forces and challenges students with mostly privileged identities to engage in diversity content related to their chosen major program of study. No longer will they be able to opt out of diversity or only complete basic requirements while exhibiting diversity competencies far below optimal levels. As the focus groups showed, some heterosexual White college men may initially balk at new requirements, but then engage in the content their program of study prescribes. Also, that White students typically learn a great deal from such courses is well known (Harper & Yeung, 2013; Hurtado, 2005; Neville et al., 2014; Sax, 2008, 2009; Spanierman et al., 2008). Finally, adding requirements beyond the general education realm normalizes diversity and may alleviate already overtaxed faculty of color who disproportionately teach these courses and whom students evaluate more harshly (Boatright-Horowitz & Soeung, 2009; Littleford et al., 2010; Martin, 2010; McGee & Kazembe, 2015; Schueths et al., 2013). Faculty of color have been the vanguards of dismantling racism and teaching diversity courses at predominantly White institutions, often because White institutional leaders have abdicated their own responsibility in disrupting oppression. It is high time White male faculty and administrators join their colleagues of color in addressing institutional inequities and challenge themselves to incorporate content on power, privilege, and oppression in their own teaching (Schueths et al., 2013).

Third, participants of the present study implicitly resisted learning about topics or power, privilege, and oppression. This was evident in their lamentations about the quality of most of their faculty teaching diversity courses. Specifically, the participants desired faculty who can present information in an unbiased, professional manner without getting the sense the

professor is shaming them for the sins of their cultural ancestors. This confirms research on student resistance in classrooms where privilege and oppression are topics because students do not want their own nonracist identities questioned (Brown, 2004; Ehrke, Berthold, & Steffens, 2014; Martin, 2010; Walters & Sylaska, 2012). It also confirms the exaggerated need for comfort and lack of stamina Whites may exhibit around issues of racial oppression (DiAngelo, 2014). To be certain, professional faculty behavior is necessary in college classrooms, and arbitrary targeting or downgrading White male students must be avoided. However, faculty with traditionally marginalized identities often feel targeted or triggered by White male resistance in classrooms (Boatright-Horowitz & Soeung, 2009; Johnson et al., 2008; McGee & Kazembe, 2015), and no faculty member, regardless of salient identity, should guarantee student comfort in diversity courses. The importance of discomfort, cognitive dissonance, or disorienting dilemmas (Mezirow, 1991) in learning new content needs to be clearly stated by faculty at the onset of every course that interrogates power, privilege, and oppression. However, faculty may also need to learn or further develop skills to communicate this necessity clearly. Appropriate faculty development could take place in workshops on pedagogy, didactics, or classroom management; conference attendance; or one-on-one mentoring by faculty or administrator colleagues.

White male resistance to diversity content and fragility were further evident in the complaints by the participants about apparent shaming or bashing of White men by instructors. College educators, especially White male instructors, have to make sure we challenge White college men on issues of privilege and oppression, and we have to do it in a way that does not let them retreat or withdraw from the classroom or the learning. What students described in the data as hiding from faculty who seemed to shame them, I have termed the "hiding in the corner with a blanket over my head" way of White male engagement in diversity courses. Social privileges allow White men not to engage in topics relative to diversity that make us uncomfortable, so we hide or are afraid to engage. In such an environment, no learning occurs. When no learning occurs, White college men exit the classroom without having raised their critical consciousness or activated their responsibility to assist with social change. They leave college with exactly the same low skill set around interactions across difference with which they arrived on their campus.

College educators need to draw White college men out from under the blanket, challenge and support their thinking, and help them engage more critically in all types of diversity discussions and initiatives. We also have to help them grow much thicker skins than what

they are used to. Colleges and universities may have become too careful in educating students about privilege and oppression, diversity and inclusion, and equity and social justice. Discomfort is a necessary factor in learning, and we as educators need to stop avoiding discomfort in students from traditionally privileged identities. That is not to say we should not support them, but guaranteeing comfortable learning environments for heterosexual White men will not generate much learning on their part.

Heinze (2008) identified several techniques specifically White instructors can use to handle White male resistance, including instructor awareness of student discomfort, awareness of potential student conflict with previously held ideas, the turning of student objection into questions for group discussion, and the avoidance of arguing one-on-one with a student. Structurally, though, colleges and universities need to challenge more White and more male faculty to incorporate diversity content in their courses, and to become skilled at teaching this content (Schueths et al., 2013).

Challenging more White faculty to avoid ducking diversity (Schueths et al., 2013) needs critical attention and training. Lim et al. (2015) suggested faculty needed more development programs and training to teach important diversity content with which they are unfamiliar. Departments must begin critical conversations about integrating diversity courses in majors and prepare faculty with privileged identities to incorporate diversity in their research and teaching. Beyond frequent discussions of topics centering on power, privilege, and oppression at the meeting or lunch table, this can be done by providing grant funds for research focusing on such topics, incentivizing attendance at workshops facilitated by local teaching and learning centers, or sending faculty to regional or national conferences.

Conclusion

Participating in diversity initiatives, including coursework, leads to positive student outcomes, specifically in heterosexual White male college students. However, they do not typically engage in diversity initiatives as frequently as their counterparts with traditionally marginalized identities. Most institutions of higher education require diversity courses from their undergraduate students, but not always in major programs of study. In the present study, participants regarded the quality of such required coursework and the instructors teaching it as low. Moving such requirements into major programs of study relieves faculty who are disproportionately burdened with teaching general education courses and who are further marginalized by student evaluations. Requiring diversity in the major is supported by the

vast majority of the participants in the present study and makes content surrounding diversity more relevant for students with privileged identities. Finally, colleges and universities must require more White male faculty to become skilled in teaching diversity content in their courses. Supplementing diversity coursework in general education with additional requirements in major programs of study not only benefits students and faculty, but it also signals the institution knows diversity is not a box to check, but a value to sustain.

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Self-Efficacy Beliefs and Effective Instructional Strategies: U.S. University English Learners' Perspective

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This study examined English Learners' (ELs) self-efficacy beliefs in a U.S. university setting by using a survey, interviews, and focus group discussions. The results identified that ELs from different disciplines had positive self-efficacy beliefs about their overall English learning, and self-efficacy was related to ELs' age, years of English learning, country of origin, and previous educational level. However, ELs in this study lacked confidence and self-efficacy in learning in academic courses, and they faced challenges when using academic language. Effective instructional strategies such as social modeling, social persuasion, motivational feedback, group work, and participative assessment methods were identified by ELs in this study.

With the increasing enrollment of English Learners (ELs) in postsecondary education in the United States, linguistic diversity in the classroom may be a benefit as well as an obstacle. In some cases, English may naturally become a lingua franca in classrooms and form a connection among students from different countries. However, in a classroom of high linguistic diversity, students may find little support among their classmates if they cannot understand each other. Studies have identified adjustment issues for ELs, including educational system differences, academic requirements, cultural differences, language challenges, food incompatibilities, time management, and social integration (Catalano, Fox, & Vandeyar, 2016; Fang, 2014; Galloway & Jenkins, 2005; Johnson & Sandhu, 2007; Khawaja & Stallman, 2011; Klapwijk & Walt, 2016; Poyrazli & Grahame, 2007). Limited language proficiency is one of the vital issues for ELs, and mastering a foreign language requires learners to overcome several difficulties. This process usually takes a considerable period of time. Cummins (1981) argues that it generally takes three to five years for ELs to develop basic communication skills and five to seven years to obtain the proficiency level required for academic learning.

Due to the language challenge and other adjustment issues, ELs are not confident when expressing their opinions and communicating with people from other cultures (Poyrazli & Grahame, 2007). Students with high levels of self-confidence and self-efficacy tend to experience lower levels of stress and direct their energy toward improving their cultural adjustment (Poyrazli & Grahame, 2007). However, ELs may lack the skills that contribute to increasing their self-efficacy (Leclair, Doll, Osborn, & Jones, 2009). Efficacious students study for longer periods, and self-efficacy determines their engagement on the task, which includes demonstrated persistence and perseverance with the task (Caraway, Tucker, Reinke, & Hall, 2003; Wiseman & Hunt, 2001). With these

circumstances, understanding ELs' self-efficacy is paramount to providing appropriate instruction. The purpose of this study is to examine ELs' self-efficacy beliefs, factors contributing to ELs' self-efficacy and persistence, and instructional strategies perceived as effective by ELs in a university setting.

Literature Review

College students with high self-efficacy beliefs were more likely to invest more effort and persistence towards goals and used better and more strategies than students with low self-efficacy beliefs (Diseth, 2011; Yusuf, 2011). Self-efficacy was found to be associated with many factors, such as length of learning and level of schooling (Magogwe & Oliver, 2007; Teng, 2005; Tilfalioglu & Cinkara, 2009), culture (Klassen, 2004), and academic achievement (Diseth, 2011; Kim 2009; Naseri & Zaferanieh, 2012). Diseth (2011) investigated Norwegian undergraduate psychology students in a correlation study and found strong relationships between self-efficacy and learning strategies, as well as self-efficacy and academic achievement. Klassen (2004) reviewed 20 articles collected over the course of 25 years to investigate self-efficacy beliefs across cultural groups. The conclusion was that self-efficacy beliefs were higher for participants from western, individualist cultures than for participants from Asian, collectivist cultures. Naseri and Zaferanieh (2012) found that gender, academic major, English score, learning strategies, and career goals had significant effects on Iranian EFL senior and junior students' self-efficacy. The authors also observed that students who employed a combination of different strategies had the highest self-efficacy scores. Magogwe & Oliver (2007) examined the relationship between language strategies, age, proficiency, and self-efficacy beliefs of EFL students in Botswana by using surveys (i.e., Morgan-Jinks Student Efficacy Scale, Children's Perceived Academic Self-Efficacy: An Inventory). A significant

positive relationship between self-efficacy and overall strategy used by students across all proficiency levels was found, but the relationship was not statistically significant. Most of the studies investigated student's self-efficacy in the EFL (English as Foreign Language) setting; however, few studies examined ELs self-efficacy beliefs in the ESL (English as Second Language) setting. Kim (2009) examined the self-efficacy beliefs of 119 international teaching assistants in the United States and revealed that there were positive relations between English fluency and self-efficacy. It was also pointed out that an international teaching assistant faced additional challenges as compared to those faced by teaching assistants in general. College ELs in the United States in general experience higher levels of stress than American students (Araujo, 2011; Kamhi-Stein & de Oliveira, 2008; Lin & Scherz, 2014). Compared with domestic students, ELs lacked the factors that contributed to increasing their self-efficacy such as support from family, friends, and community (Ambe, Falconer, & Leewer, 2004; Bifuh-Ambe, 2011). Leclair et al. (2009) determined that ELs rated themselves lower in academic self-efficacy and rated their classmates as more likely to succeed. This perception affected their communications in class when discussing issues with classmates or instructors (Holmes, 2004). Furthermore, studies sought to explore more effective methods to improve these students' self-efficacy. Idrus and Sivapalan (2010) concluded that when a student discovered a learning strategy that improved performance, this realization alone could lead to greater overall self-efficacy. Gahungu (2007) revealed that students needed to be taught or trained in the use of strategies to become motivated in their learning and also found significant positive relationships between language learning strategy use and self-efficacy, as well as between self-efficacy and language ability. If learning strategies and strategy instruction are so important to the increase of ELs' self-efficacy, what are the implications for college instructors?

Teachers designed their own instructional strategies according to their teaching objectives and to adapt to different learners and contexts (Kumaravadivelu, 2006; Uzum, 2013). Previous studies found some of the factors that contributed to ELs' self-efficacy and persistence included interest, motivation, social persuasion, social modeling, psychological responses, and strategy instruction (Bandura, 1977; Hsieh & Kang, 2010; Naseri & Zaferanieh, 2012; Samimy, Kim, Lee, & Kasai, 2011). Interest in the subjects taught influenced ELs' self-efficacy, and teachers influenced to a large degree the learners' self-efficacy (Huang & Chang, 1996), which indicated that teachers could increase interest in a topic to improve learners' self-efficacy. Social

persuasion and psychological responses could also increase learners' self-efficacy and confidence (Bandura, 1977). A study conducted by Hsieh and Kang (2010), proposed that successful ELs attributed their success to internal and personal factors. The study also suggested that teachers should be more attentive to the self-efficacy beliefs of ELs, and if teachers could facilitate learners in becoming more aware of their cognition, motivation, and behavior in language learning, then students could achieve more control of the outcomes and achievements (Hsieh & Kang, 2010). Wong (2005), Idrus and Sivapalan (2010), and Naseri and Zaferanieh (2012) claimed that ELs' self-efficacy could be increased by teaching and modeling learning strategies; the negative attitude of learners with low self-efficacy should be addressed so that the overall performance in the classroom could be improved. Other studies (e.g., Kim, 2007; Krase, 2003, 2007) stressed the importance of a more collaborative relationship between instructors and ELs. Myles and Cheng (2003) concluded that the collaborative relationship between instructor and ELs, advisor's guidance, motivational feedback, group work, and psychological support were effective strategies for ELs to overcome difficulties, increase self-efficacy, and participate properly and effectively in their respective disciplines. Samimy et al. (2011) related the importance of mentoring, helping students develop mastery, modeling correct social use of language, and persuading students of their own effectiveness in support of ELs' participation in their academic endeavors. Daoud (2003), and Cheng (2013), further suggested more in-class participation and discussions, as well as more paired or group work, as essential teaching strategies. Furthermore, previous studies were not able to offer effective solutions to help ELs have full access to appropriate curricula, instructional resources, and methods that matched the student's level and needs (Cho & Reich, 2008; Sharkey & Layzer, 2000). In addition, learners' self-efficacy beliefs and methods to improve their self-efficacy had not yet been adequately examined when integrated into an ESL context (Lee & Zentall, 2012). The majority of previous research explored different methods to help ELs comprehend learning course material effectively and efficaciously across levels of pre-kindergarten to the twelfth grade; however, fewer studies in the L2 literature explored the perspectives of ELs at the postsecondary level (Bifuh-Ambe, 2011). Moreover, most previous studies were quantitative in nature. In order to adapt to the local context, including the perceptions of ELs, the language abilities of ELs, and approaches to ensure the ELs success in academic courses, this study examined U.S. college-level ELs' self-efficacy beliefs, factors contributing to ELs' self-efficacy and

persistence, and instructional strategies perceived as effective by these ELs by using survey, interviews, and focus group discussion. The research questions were as follows:

1. What are college-level ELs' self-efficacy beliefs about English language learning?
2. What is the relationship between self-efficacy and demographic characteristics for these college-level ELs?
3. What factors hinder or contribute to ELs' self-efficacy and persistence in English language learning and academic learning in courses?
4. What instructional strategies are perceived as effective for ELs to increase their self-efficacy and performance in their academic learning, as well as English language learning?

Theoretical Framework

Self-efficacy is an aspect of social cognitive theory. McCombs (2001) explains self-efficacy in reference to the learner's judgment of his or her competency for successful task completion. This theory assumes that people possess the ability to reflect and regulate their actions and to shape their environment rather than merely react to it.

According to Bandura (1997), self-efficacious individuals view attainments as under their control. When students believe they are capable of performing well on an academic task, they are motivated to perform well, work harder, and persist in the task for longer periods of time. These behaviors (or positive self-efficacy) are essential for academic success. High levels of self-efficacy have been associated with high levels of achievement. The level of perseverance devoted to a task is supported by perceived self-efficacy (Bandura, 1997). Efficacious students "sustain their work longer" because they anticipate that they will succeed at the end of the task (Wiseman & Hunt, 2001, p. 40). Conversely, students with a low self-efficacy tend to believe that difficult tasks are not achievable and lack confidence in their abilities (Bandura, 1997). Schunk (1995) claims that learners are likely to have low self-efficacy if they think they have great difficulty in understanding the academic material while those who feel capable of understanding the material have a higher self-efficacy. "Self efficacy determines aspect of task engagement including which tasks individuals choose to take on, the amount effort, persistence, and perseverance they demonstrate with regard to the task, and their feelings related to the task" (Caraway, Tucker, Reinke, & Hall, 2003, p. 423). Students with higher self-efficacy or positive perceptions in their ability tend to be involved in challenging tasks and show a positive affect and greater persistence in the face of difficulties, whereas students with low self-efficacy or negative self-perceptions are more likely to show low persistence in the face of difficulties (Dweck & Elliott, 1984).

It is necessary to examine some terms that can mistakenly be confused with self-efficacy: motivation and self-confidence. While self-efficacy is used interchangeably with motivation in some literature, there is a significant difference in the definitions. Motivation is a broad concept including both external and internal influences that affect outcomes while self-efficacy is focused only on the internal beliefs of the learner. Self-confidence shares features with expectancy and self-efficacy, but it tends to include anxiety, while self-efficacy does not. Self-confidence is usually measured at the time of testing, while self-efficacy is considered a perceived proficiency and is therefore tested in the future or at the end of a study (Bandura, 1997; Tremblay & Gardner, 1995).

There are four main contributors to a person's self-efficacy: mastery experiences, social modeling, social persuasion, and psychological responses (Bandura, 1977). Mastery experiences mean that an individual's self-efficacy can be increased when the person successfully completes tasks or assignments. However, if the individual fails to deal with challenges, his or her self-efficacy decreases. Social modeling refers to observing others accomplish tasks. A person's self-efficacy is increased if that person believes that he or she can also successfully perform the same tasks that he or she has observed others perform. Social persuasion facilitates a person's self-efficacy because the encouragement of others raises an individual's confidence in completing difficult tasks. Psychological responses refer to a person's mood, level of stress, and state of mind. A high level of stress towards a particular task can lower the person's self-efficacy. If the person can elevate his or her mood to overcome stress, then self-efficacy increases (Bandura, 1977).

Method

In order to investigate self-efficacy beliefs of college-level ELs and the relationship between self-efficacy and demographic characteristics for these college-level ELs, a questionnaire adapted from the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1991) was used in this study. To examine contributors to ELs' self-efficacy, persistence, and effective instructional strategies for ELs, interviews and focus group discussions were used to collect data.

Participants

The participants in this study were ELs enrolled at a major public university in the southeast of the United States. These participants were students who were taking

English courses in an ESL program at the university. The ESL programs were designed to develop functional and interpersonal English communicational skills. There were no English native speakers in the ESL courses. Courses included classroom instruction, small group discussions, language labs, and out-of-class work. The program was open to persons eighteen years of age or older who had already attained a basic knowledge of English, but were not proficient in English. The ELs in this study were selected as possible participants because they were enrolled as students in the ESL program. Participants were age 18 or older, and all were English language learners whose primary language was not English and who were not yet proficient in English. Each participant had to have attended at least one semester of ESL classes. They attended regular academic classes in their major area of study outside the English as-a-second-language curriculum. The above criteria were required to ensure that the ESL participants had a similar educational background prior to their participation in the study.

There were a total number of 198 ELs participating in the questionnaire. This study mainly focused on demographic characteristics including gender, age (ELs more than 25 years old vs. ELs less than 25 years old), Asian ELs vs. non-Asian ELs, years of English learning (less than 5 years, between 5 to 10 years, more than 10 years), and previous educational level (e.g., high school diploma, bachelor's degree, master's degree, or doctorate).

The participants consisted of 55.6% males and 44.4% females. The participants who had high school diplomas consisted of 47.0%, bachelor's degree holders were 33.8%, and master's and doctoral degree holders were 19.2%. The participants who were less than 25 years old (between the age of 18-24) were 58.1%, and those over 25 years of age consisted of 41.9%. The participants who came from Asian countries were 70.2%, while non-Asian students were 29.8%. Table 1 (see Appendix A) shows the frequency distribution of the 198 survey participants by each demographic group.

Next, eight participants were individually interviewed. These eight participants were selected because they were from different countries and majors. These participants spoke Malayalam, Korean, Turkish, Bengali, Malay, Persian, Chinese, and Egyptian Arabic as their native languages. The length of time they resided in the United States ranged from one to four years, and all of them had never lived in an English-speaking country other than the United States. Table 2 (see Appendix B) presents the demographic information of these participants.

Measurements and Procedures

The questionnaire adapted from the Motivated Strategies for Learning Questionnaire (MSLQ) was used first in this study to measure ELs' self-efficacy beliefs (see Appendix C). The questionnaire consisted of two measures: Demographic Information and the MSLQ. The demographic information was developed based on previous studies (i.e., Oxford, 1990; Park, 1995; Yang, 1992). The MSLQ was based on a social-cognitive view of motivation (Pintrich, 2003). It was developed by Dr. Paul Pintrich and his colleagues at the University of Michigan to evaluate the effectiveness of a "Learning to learn course" for college undergraduates (Pintrich et al., 1991). The MSLQ has been validated and used in many studies (e.g., Pintrich, 2003; Pintrich et al., 1991, 1993). This questionnaire is a self-report instrument designed to assess college students' motivational orientations and self-regulated learning for a specific course (Pintrich et al., 1991). The questionnaire was used in this study to measure ELs' self-efficacy beliefs about the English courses provided by the ESL program. The MSLQ consisted of 15 sub-scales, six within the motivation section and nine within the learning strategies section. Since the self-efficacy subscale in MSLQ was designed particularly to measure self-efficacy beliefs of learners, the subscale was used in this study to examine college-level ELs' self-efficacy. The items measured the participants' beliefs about their capabilities to learn or perform a task such as, "I'm certain I can understand the most difficult material presented in the readings for this course," "I'm confident I can learn the basic concepts taught in this course," and "I'm confident I can understand the most complex material presented by the instructor in this course" (Pintrich et al., 1991). Students rated themselves on a seven-point Likert scale, from one (Not at all true of me) to seven (Very true of me). Scores for the individual scales were computed by taking the mean of the items that made up the scale. With the Cronbach Coefficient Alpha test, the value of Cronbach's Alpha for the self-efficacy subscale was .903. A value of .70 or higher was considered evidence of reliability (Becker, 2000).

Eight participants were then given individual interviews by this researcher. Individual interviews with open-ended questions related to ELs' learning experience in U.S. university classrooms were used to collect the data which explored contributors to self-efficacy and effective instructional strategies (see Appendix D). The questions were developed based on the literature in the area. Each interview lasted approximately 40 minutes. After taking interviews, six participants agreed to participate in a focus group discussion facilitated by this researcher. Questions in the protocol of focus group discussions were designed based on the analysis of the data collected from individual interviews (see Appendix E).

These interviews and focus group discussion were recorded and transcribed. After transcribing, the data were coded and analyzed using the qualitative analysis software package Atlasti, with a specific focus on research questions of the present study. Major themes

Table 3
Summary of Variation in Self-efficacy by Gender

| Self-efficacy | Female (N=88) | | Male (N=110) | | | |
	Mean	Standard Deviation	Mean	Standard Deviation	*t*	*p*
	5.58	.857	5.40	.933	1.337	.183

*p<.05

Table 4
Summary of Variation in Self-efficacy by Age

| Self-efficacy | <25 (N=115) | | ≥25 (N=83) | | | |
	Mean	Standard Deviation	Mean	Standard Deviation	*t*	*p*
	5.36	.932	5.65	.835	-2.230	.027*

*p<.05

Table 5
Summary of Variation in Self-efficacy by Country of Origin

| Self-efficacy | Asian Els (N=139) | | non-Asian Els (N=59) | | | |
	Mean	Standard Deviation	Mean	Standard Deviation	*t*	*p*
	5.41	.929	6.00	.416	-3.15	.002*

*p<.05

emerged, and two researchers from the field of adult education reviewed, compared, and analyzed the codes and themes to establish the reliability by using an inter-analyst agreement. Participants then read the transcriptions to verify their own words and comments. Data was collected confidentially with protection of linkages to identifiable information. Student responses were presented using fictitious initials.

Results

Results of the Survey

SPSS-PC 17.0 was used to perform the descriptive statistics to examine the scores of self-efficacy beliefs. The mean score of self-efficacy was 5.48. The survey was a seven-point Likert scale. The results indicated that participants in this study had a positive self-efficacy belief about their English language learning. Three independent sample t-tests were used to examine the differences of self-efficacy based on demographic factors, which included age, country of origin, and gender. Table 3 shows that there were no statistically significant differences of self-efficacy in terms of gender. However, as shown in Table 4 and 5, ELs who were more than 25 years old (*M*=5.65) had a significantly higher level of self-efficacy than those less than 25 years old (*M*=5.36), *t* (198)=-2.23, *p*<.05, and the effect size (Cohen's *d* effect=0.33) was moderate. Asian ELs (*M*=5.41) had a significantly lower level of self-efficacy

than non-Asian ELs (*M*=6.00), *t* (198)=-3.15, *p*<.05, and the effect size (Cohen's *d* effect=-0.83) was large.

Two one-way ANOVAs were used to examine the differences of self-efficacy based on demographic factors, which included years of English learning and previous educational level.

A one-way ANOVA was based on the assumptions of having independent random samples, homogeneity of variance, and a normal distribution of variables. The results of the homogeneity of variance showed that no statistically significant difference existed at the .05 level. In terms of years of English learning for participants in this study, the results of a one-way ANOVA displayed a mean score of 5.47 for ELs who had learned English for less than five years, 5.32 for those who had learned English for between 5 to 10 years, and 5.73 for those who had learned English for more than 10 years. As shown in Table 6, the one-way ANOVA data depicted that the differences of self-efficacy scores among them were statistically significant, *F* (2, 195) = 3.55, *p* <.05, the effect size (η^2=0.035), which was moderate. A Bonferroni post-hoc test was selected to further analyze the data. As shown in Table 7, the post-hoc test revealed that ELs who had learned English for more than 10 years had a significantly higher level of self-efficacy than those who had learned English between 5 and 10 years (*p* <.05). There were no other significant differences of self-efficacy based on years of English learning. Concerning the previous educational level, the results

Table 6
ANOVA

	Sum of Squares	df	Mean Square	F	*p*
Between Groups	5.626	2	2.813	3.549	.031*
Within Groups	154.584	195	.793		
Total	160.210	197			

*p<.05

Table 7
Post Hoc Test

(I) Years of English Learning	(J) years of English learning	Mean Difference (I-J)	Std. Error	*p*
<5 years	5-10 years	.15476	.15054	.916
	>10 years	-.25846	.16556	.360
5-10 years	<5 years	-.15476	.15054	.916
	>10 years	-.41322	.15518	.025*
>10 years	<5 years	.25846	.16556	.360
	5-10 years	.41322	.15518	.025*

*p<.05

Table 8
ANOVA

	Sum of Squares	df	Mean Square	F	*p*
Between Groups	7.452	2	3.726	4.756	.010*
Within Groups	152.758	195	.783		
Total	160.210	197			

*p<.05

Table 7
Post Hoc Test

(I) diploma	(J) diploma	Mean Difference (I-J)	Std. Error	*p*
ELs who had high school diplomas	Els who had bachelor's degrees	-.35745	.14183	.038*
	Els who had master's and doctoral degrees	-.43364*	.17041	.035*
Els who had bachelor's degrees	Els who had high school diplomas	.35745*	.14183	.038*
	Els who had master's and doctoral degrees	-.07620	.17974	1.000
Els who had master's and doctoral degrees	Els who had high school diplomas	.43364*	.17041	.035*
	Els who had bachelor's degrees	.07620	.17974	1.000

*p<.05

of a one-way ANOVA displayed a mean score of 5.28, 5.63, 5.71 for ELs who had high school diplomas, bachelor's degrees, and master's and doctoral degrees respectively. As shown in Table 8, the differences of self-efficacy scores among them were statistically significant, $F (2, 195) = 4.76$, $p < .05$, and the effect size ($\eta^2 = 0.047$) was moderate. The Bonferroni post-hoc test in Table 9 revealed that ELs who had high school diplomas had a significantly lower level of self-efficacy than those who had bachelor's degrees ($p < .05$) and those who had master's and doctoral degrees ($p < .05$).

Results of Interviews and Focus Group Discussion

After coding and analysis, the following five code categories describing the broad topics emerged: (1) academic language, (2) persistence, (3) social persuasion and social modeling, (4) immersion, and (5) participative assessment.

Academic language. Academic language is a set of linguistic "registers" associated with academic disciplines (Schleppegrell, 2009). The participants must learn not only interpersonal communication language, but also the content of different subjects. The participants reported that the complex and abstract vocabulary and technical terms used in academic courses was challenging. It showed that the academic language hindered their self-efficacy in academic learning in courses. The ELs in this study measured how good (or bad) they felt about their academic achievements by comparing themselves with their peers instead of comparing themselves with their prior learning, which, according to Bandura (1977, 1995, 1997), can lower a person's self-efficacy. How a person feels about performing a task can raise or lower self-efficacy. Learners' beliefs about themselves, their belief in their capacity to achieve, and the value they placed on effort, ability, and strategies can be interpreted as part of self-efficacy (Bandura, 1977, 1995, 1997). This researcher found that the participants had a negative perception about academic language learning. The comments of participants are as follows:

- "I can't understand professor well, and she give instruction, but I cannot understand the vocabulary she used. I made many mistakes of special terms. I lost confidence and interest in this course" [Z].
- "Sometimes professors in class talk very fast. They suppose I understand. I can't follow them and feel frustrated. I don't know technically what the words mean, and I have to pretend I understand them" [P].
- "I felt native speakers read papers more quickly. It is easier for native speakers to understand some terms. I could not remember the correct academic vocabulary" [A].

In the focus group discussion, participant A further stated his perceptions of academic experience, "[S]ometimes I don't have the power to face the [academic language] challenge. I will go to learn other subject and maybe I don't feel positive about this class." When asked to describe one of the successful assignments in their academic courses, two participants, Z and S, commented that they didn't have any successful assignments or accomplishments. This study revealed that they didn't have mastery experiences and that they had negative psychological responses. These data showed that their self-efficacy beliefs about academic learning were, to some degree, negative. Additionally, a high level of stress towards a particular task can lower the person's self-efficacy. Participant Z further pointed out, "I feel the school work is really stressful and I did not and cannot perform well. I have to take extra time to remember the abstract terms." This indicated that academic language was an issue for the participant to obtain positive self-efficacy and achieve academic success.

Persistence

Support and encouragement from teachers and peers seemed to influence ELs' self-efficacy and persistence in English language and academic learning.

- "English learning is a gradual and continuous process. I have to always work hard, and if I give up I will go back to my previous level. If I want to be successful I have to persist on it. Now I find I have made progress. My native-speaker friends and classmates helped me a lot" [A].
- "I felt really stressful at the first semester [in the United States], but the professor [from an academic course] is always ready to help me. I ask native speakers help my [English] writing. After that I had more confidence to continue my study. I know how to do research and my [English] writing skills improved a lot…we graduate students have more time and opportunity to stay with American professors and colleagues in the office to do research and discuss and communicate with each other and it really helps me to learn more" [F].

This student benefitted from many opportunities to communicate and interact with professors, peers or other English native speakers, which assisted in improving and gaining confidence in English language and academic course learning.

However, participant L noted: "We don't have so many opportunities to communicate with professors, and I feel lonely. I feel my English vocabulary, especially some academic vocabulary, does not improve after I came to the U.S." [L].   Participant L was an undergraduate student, and compared with graduate students, he had less opportunity to communicate with others. Also, he was more likely to have less effective strategies to deal with stress or difficulties.

Interestingly, there was a finding from the focus group discussion that ELs had a high level of self-efficacy in certain subject areas. Participant X noted, "We are better than native speakers in math, programming, or calculations. In experiment we use a computer language instead of English language." Self-efficacy was specifically related with a certain course or class content. He continued to note, "But when it comes to presentation, American students always do better than us [in academic courses]. Their critical thinking and their English are better than *[sic]* us." All the participants in the focus group discussion agreed that their English native-speaking peers performed better in presentation or other interactive class activities than them. They further agreed that the basic information exchange between teachers and students in their home countries was in a one-way transfer rather than a two-way communication. Participant X stated, "In my home country [China] we don't have group work or group presentation in class, the major way of teaching is lecture and teachers rely on textbook." Many students in their home countries lacked self-directed learning experience and did not take the initiative to think, and gradually developed a dependency on textbooks and professors. Group work or more interactive class activities were agreed as effective instructional strategies by these participants. For instance, participant A further noted: "Through group project I can practice my English listening and speaking and I know how to cooperate with other students" [A].

Another factor contributing to self-efficacy and persistence was internal motivation. Learners who were internally motivated learned a language for purposes such as career advantages, acceptance into college, or attaining an academic degree; or for altruistic purposes such as a more comprehensive understanding of people or in the development of cultural competencies. Participants had a high internal motivation in their English language learning. For instance, participants noted:

- "I really wanted to learn and become fluent in the language I decided to take. I always enjoyed my weekly [English language] lessons. I want to acquire the highest level of English to learn more about the world and to have the feeling of great success. [A]

- It [English] is the most useful for the future and I will have better career chance [if I learn English well]" [L].
- "My kids study here [in the United States]. I want to be qualified to teach my kids and help them in their homework, so I study hard and I feel my English improved a lot…English language level is an ability of communication and it is a required skill. If I decided to go back home for a teaching position in a college, English is a necessity to facilitate my teaching performance" [A].

Social persuasion and social modeling. Social persuasion was one of the sources or contributors of a learner's self-efficacy, and raised an individual's confidence in completing tasks. Comments regarding the value of social persuasion included:

- "My instructor [from an ESL course] always says "I love your pronunciation, it is different but I love to hear it, you are smart and keep your hard work ongoing". She always praised my writing and all my efforts although it is not exemplary. As lots of encouragement from her, I decided to pursue my doctorate degree" [P].
- "I once worried about my language level, my grammar, my academic writing. I talked to my professor and she said, 'Don't worry, you are fine, I just want you learn *[sic]*, and you can do it.' She always offers me assistance if I have problem…and sometimes I don't know how to do a research, and when I talked my professor, she give me praise, encouragement and suggestions or useful feedback which make me think it became easier" [F].
- "She [the professor from an academic course] helps me a lot and encourages me a lot. We usually…usually we…because it is also a distance course, and we have only three people in classroom, and I am the only international student. She pay a lot attention on me. Whenever comes into a topic, she may ask me what is the case in China. And also she was very nice. When I first register her class she bought the textbook for me" [X].

Teachers' support, encouragement, approval, or recognition for a student can reinforce his or her behaviors. Social persuasion facilitates students' self-efficacy and raises their confidence in completing difficult tasks (Bandura, 1977). Social modeling was also reported and agreed as a contributor to self-efficacy, as well as an effective instructional strategy by

participants in the focus group discussion. For instance, participant F noted:

My international classmates talk a lot in the class and they did class work very well. I was asked to work in a small group with them. They praise my pronunciation and help to correct my grammar mistakes. It is good for me because I want to learn well, just like them [F].

Also, Participant P observed:

My American classmates are very good at presentation and asking and answering questions. In the group work, I try to interact more with them because they are good example[s] for me to follow, and I can learn a lot from them"[P].

Participant X agreed and continued:

- "I once had a group project with one of my international colleagues. I had much contact with him in the same office. He helped me a lot. When I met some cultural differences, like what is "tailgate", and I don't know and ask him and he explained it to me, and also told me if I don't know I should ask and then I can learn. He set a good model or example for me" [X].
- "Professors [from academic courses] provide us some exemplary work of classmates, which is very helpful. For example, sometimes the work shows me the correct use of language in paper and sometimes the model tells me how to do research. The model or example is not same as mine but I can follow it and it makes my work easier and more successful" [X].

Immersion. Immersion was reported as another effective instructional strategy. Participant X in the interview commented: "When a student [who is learning English] is forced to speak the [English] language and there is no one else speaking their native language, a person is bound to learn quickly" [X].

In their home country, participants did not have many opportunities to use and speak the English language. As participant A noted:

The teachers [in my home country] don't care about the [English] pronunciation or speaking. What teachers focus on are [English] reading, [English] writing and memorizing [English] vocabulary…If you master reading, grammars, and writing that will be very fine and enough to join colleges in my home country. But here [in the United States], we can communicate and cooperate with others by using English in class. In the group discussion, my group

members were from different countries, and I have to try to communicate with them [A].

Participant X also noted:

In my previous English learning, it is more like an exam-oriented study concentrating on vocabularies and reading comprehension. Now [in the United States] my focus has changed to practical communication with others, not on the book any more. My learning strategy changed from memorizing to thinking in English and communicating and cooperating with others, which improve my spoken English a lot [X].

Participative assessment. Regarding assessment methods, participants noted:

- "Final exam was very stressful because of the language issues, even I know the answer of the question but I could not remember the correct vocabulary. It made feel frustrated" [F].
- "We just had one final exam for a class. I have to spend more time than my American peers to prepare the final exam. It was really stressful and I worried about it a lot at that time" [S].

Comprehensive tests given at the end of the semester for grading purposes increased ELs' anxiety and decreased self-efficacy. Participants X and A explained the value of alternate assessment methods:

- "I like presentation. I can express my ideas and practice my oral English and Americans are better in presentation and they can have a better communication with audience, so I can learn from them [through class presentations] and I hope I can also do it well. Gradually, I get more confidence. One professor [from an academic course] let us do assessment for our classmates. I was happy I could participate in the assessment. It is good because we can get more feedback from our classmates [than from only one teacher]. It helped me a lot" [X].
- "Here [in the United States] we have assignment and test, and maybe three or four tests in each semester. It is good because students can improve through these assignment and test. In my home country we only have test at the end of semester, we can't study step by step. Besides, in this kind of test I just got a final score. I couldn't get comments or feedback. I don't know where was my mistake and how to make progress" [A].

Discussion and Conclusions

This study examined college-level ELs' self-efficacy beliefs and effective instructional strategies for ELs in the ESL setting. Based on the survey results, ELs in this study had positive self-efficacy beliefs about their English language learning. Asian ELs had a significantly lower level of self-efficacy than non-Asian ELs. According to Bandura (1997), there has been a great amount of variation on how cultures operated within their social structure. ELs in U.S. university settings were faced with an environment unfamiliar to them. Those coming from collective societies were faced with greater stress and a prolonged adaptation process when trying to adapt to an individualistic culture (Oyserman & Lee, 2007). The finding of the present study was consistent with the findings of Klassen (2004). Interestingly, Bandura pointed out that self-efficacy should not to be confused with individualism, since both individualistic and collective societies experienced the same level of efficacy. The difference was in the way self-efficacy was directed. Collective societies used "group-directedness" to acquire the results they sought while individualistic societies used "self-directedness" (Bandura, 1997, p. 31).

Also revealed were age differences in ELs. ELs who were more than 25 years old had a significantly higher level of self-efficacy than those less than 25 years old. ELs who had learned English more than 10 years had a higher level of self-efficacy than those who had learned English between 5 and 10 years. ELs who had high school diplomas had a significantly lower level of self-efficacy than those who had bachelor's degrees and master's or doctoral degrees. The findings affirmed previous studies that determined self-efficacy was related to the length of English learning and the level of schooling (Magogwe & Oliver, 2007; Teng, 2005; Tilfalioglu & Cinkara, 2009).

Some participants reported negative self-efficacy beliefs about their academic courses and faced challenges from academic language. Academic language is often highly abstract and contextualized, and it requires greater mastery of a language than interpersonal communication language (Brown, 2007; Scarcella, 2003). ELs may lack the linguistic background that is taken for granted by teachers (Bifuh-Ambe, 2009; Hakuta, Butler, & Witt, 2000). Instructors must be cognizant of the language and material used in classrooms and increase comprehensibility of courses for ELs. It is recommended that teachers assist students to develop mastery, model correct use of academic language, provide visual support, use hands-on activities, and connect with multicultural students. Additionally, this study revealed that ELs didn't have mastery experiences and that they had negative psychological responses. These two factors are both sources and contributors of self-efficacy. Lack of these

two factors hindered their self-efficacy beliefs about academic courses in learning. It is suggested that teachers accommodate needs of this group of learners and help them to contend with stress and negative affective factors that may interfere with learning.

It is worthy to note that the results of the survey indicate that the ELs in this study had a positive self-efficacy belief about their English language learning courses in general, but from the individual interviews the findings uncovered negative perceptions about the participant's academic language level. The rationale for this discrepancy may be that more than half of the participants interviewed were graduate students. The graduate level courses require mastery of a higher level of complex professional terms and formal language. Moreover, the English language knowledge taught in English language courses may be different from the academic language knowledge required for academic courses across different disciplines. The English language courses provided by ESL programs are mainly designed to develop functional and interpersonal English communicational skills. College-level ESL courses continue to experience difficulty in developing students' academic language competency, and many ELs do not acquire English skills quickly enough to ensure subsequent academic success in different disciplines (Bifuh-Ambe, 2011).

ELs' self-efficacy and persistence could be influenced by support and encouragement from teachers and peers. Internal motivation was also reported as a contributor to self-efficacy and persistence. Individuals' level or type of motivation and affective states were associated with their self-efficacy beliefs (Bandura, 1997). According to Bandura (1997), increasing motivation could raise learners' self-efficacy. ELs in this study also benefited from social persuasion and social modeling, which are both sources and contributors to increasing ELs' self-efficacy beliefs. Teacher support and peer support were helpful for ELs to increase confidence and persistence in their academic learning. Peers' exemplary performance or behaviors can increase ELs' self-efficacy. Teachers can provide exemplary models, group activities, motivational feedback, encouragement, and reinforcement to establish a supportive environment for ELs. ELs also noted the differences between the U.S. classroom and their home country classrooms, which affirmed the findings of Fang (2014) that the learning styles, class discussion and participation, and student-teacher relationship were all different for ELs when adjusting to a new academic environment in the United States. From this perspective, the participants of the present study agreed that they had more opportunity to interact with teachers and peers, and group work was reported as an effective instructional strategy for these particular ELs.

Immersion was reported as another effective strategy for ELs in this study. It is suggested that ELs have access to more authentic materials and be provided more opportunities to speak out and interact with others in English. Teachers should facilitate class interactions and should group students from different countries so that ELs can learn from each other and communicate with others from different cultures by using authentic English.

Additionally, ELs in this study identified the value of various assessment tools including performance tasks, frequent quizzes or tests, and peer assessment. These assessment methods can be used as diagnostic tools to improve ELs' learning and provide step-by-step feedback. Traditional assessment tends to focus on competition for grades, which could increase learners' anxiety and reduce their self-efficacy. Traditional assessment can be combined with different approaches that encourage teaching innovations by using participative methods and problem-solving strategies to facilitate a much deeper approach to learning and understanding. Giving learners the power and freedom to evaluate their peers' learning helps them to reduce anxiety and to feel more efficacious and in control of their own learning. In addition, teachers can provide timely guidance for assessment in order to increase accuracy, thoroughness, and relevancy.

Teachers can also design class materials and class tasks that emphasize an individual's interest and skill development, as well as use strategies to make class tasks easier. Teachers can provide motivational feedback or positive appraisals of accomplishments and measure success in terms of self-improvement rather than by a comparison to native English speakers. Under positive conditions ELs will believe they are capable of completing a task, and ultimately this belief will result in greater confidence and self-efficacy.

Suggestions for Future Research

This study explored ELs' self-efficacy beliefs and effective instructional strategies from the student's perspective in U.S. university classrooms. However, the findings are limited to one university context. There was also a small sample size of ELs participating in interviews and focus group discussions. Most participants were graduate students. The interviews and the focus group discussions cannot accurately reflect an ELs' self-efficacy and report all of the effective instructional strategies to increase self-efficacy. Moreover, participants from different majors, class standings, and nationalities can be investigated, and the teacher's perspective can also be explored, in future studies in order to examine effective instructions and services for ELs.

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Appendix A

Table 1 Demographic Characteristics of Participants in Survey

Characteristics	f	Percent
Gender		
Female	88	44.4%
Male	110	55.6%
Age		
18-24	115	58.1%
25-59	83	41.9%
Geographic Background		
African	4	2.0%
Asian	139	70.2%
European	3	1.5%
Middle Eastern	30	15.2%
American (including Brazilian, Colombian, Mexican)	22	11.1%
Years of Study English		
Less than 5 years	61	30.8%
5-10 years	82	41.4%
More than 10 years	55	27.8%
Highest Education Level		
High school	93	47.0%
Bachelor	67	33.8%
Master	33	16.7%
Ph.D.	5	2.5%
Self-Perceptions of Overall English proficiency		
Excellent	14	7.1%
Good	108	54.5%
Fair	71	35.9%
Poor	5	2.5%

Appendix B

Table 2 Demographic Characteristics of Participants in Interviews

Pesudonym	Age	Gender	Country of origin	Major	Length of time in the U.S.	Class standing
B	26	male	India	Electric Engineering	2 years	Doctoral student
L	20	female	Korea	Statistics	2 years	Undergraduate student
F	29	female	Turkey	Agricultural Economics	4 years	Doctoral student
Z	24	male	Bangladesh	Geology	1.5 years	Graduate student(master)
A	35	male	Malaysia	Adult Education	3.5 years	Doctoral student
S	21	male	Iran	Geology	2 years	Undergraduate student
X	24	male	China	Electric Engineering	1 year	Graduate student(master)
P	32	female	Egypt	Foreign language & literature	1 year	Doctoral student

Appendix C

Questionnaire

The following questions ask about your self-efficacy about English language learning. Answer in terms of how well the statement describes you. Do not answer how you think you should be, or what other people do. Remember there are no right or wrong answers; just answer as accurately as possible. This usually takes about 5 minutes to complete. If you have any questions, let the researcher know immediately.

Demographic Information

Please first answer the following questions about yourself. Your answers will be treated in a confidential manner and only identified to the researcher for this study.

1. Gender:
      o   Male
      o   Female
 2. Age: _____
 3. Country of origin:_____
 4. First (Native) Language:
         _____
 5. Highest education level:
         _____
 6. How many years have you been studying English in your life?
     _____
 7. Please indicate the program or course you are now enrolled:
      ⦿ Intensive English Program
         ☐ Level 1
         ☐ Level 2
         ☐ Level 3
         ☐ Level 4
         ☐ Level 5
      ⦿ INTL 1820
      ⦿ INTL 1830
 8. How do you rate your overall English proficiency?
     o   Excellent
     o   Good
     o   Fair
	9. How do you rate your overall English proficiency as compared with the proficiency of other students in your class?
	     o Excellent
	     o Good
	     o Fair
	     o Poor
	 10. Why do you want to learn English? (Check all that apply)
	     o I have an interest in learning English
	     o I am interested in English speaking countries
	     o I have friends who speak English
	     o The need for future jobs
	     o The need for future education
	     o Need it for traveling
	     o Required to take English courses to graduate
	     o English is a tool of communication
	     o Other
	        (list):_____
	 11. Besides the U.S., have you ever lived in an English-speaking country?
	     o Yes
	        Indicate country_____
	        Length of stay_____
	     o No
	 12. How long have you been in the U.S.?
	     _____

o   Poor

Please read each statement and check the box that best describes how you feel:
1= Not at all true of me to 7= Very true of me

	Not at all true of me 1	2	3	4	5	6	Very true of me 7
1. I believe I will receive an excellent grade in this English class.							
2. I'm certain I can understand the most difficult material presented in the readings for this English class.							
3. I'm confident I can understand the basic concepts taught in this English course.							
4. I'm confident I can understand the most complex material presented by the instructor in this English course.							
5. I'm confident I can do an excellent job on the assignments and tests in this English course.							
6. I expect to do well in this English class.							
7. I'm certain I can master the skills being taught in this English class.							
8. Considering the difficulty of this English course, the teacher, and my skills, I think I will do well in this class.							

Appendix D

Questions for Interviews

1. Can you describe one of your most meaningful learning experiences in your English

    language learning and academic courses learning respectively?

2. How do you feel about your English level and your English language learning? What

    challenges did you overcome as an English language learner in this university? What

    factors contribute to your progress? What did you learn in this process?

3. How did others help and support your learning in this university?

4. What instructional strategies do you think are most effective for your learning?

5. Other comments you may have:

Appendix E

Questions for the Focus Group

1. Can you talk about one of your successful class assignments or projects? How did the
   professor help you?

2. Can you talk about one of the challenging class assignments or projects for you? What do
   you think the professor should do?

3. Do you notice any differences between American classrooms and your home country
   classrooms? Do these differences have any effects on your English language learning or
   academic courses learning?

4. Compared to your native speaking peers, what do you think your academic courses
   learning?

The Mindset and Intellectual Development Scale (MINDS): Metacognitive Assessment for Undergraduate Students

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The purpose of this study was to develop a concise composite measure of mindset and intellectual development in order to inform pedagogical strategies to support students' intellectual growth. A development sample of undergraduate students (n = 295) completed the 37-item pilot Mindset and Intellectual Development Scale (MINDS). The dataset was analyzed using Principal Component Analysis to determine the orthogonal dimensionality of the scale and for item reduction. The MINDS was shown to have eleven items describing two orthogonal dimensions: Intellectual Maturity and Mindset. An additional item was included to control for the social desirability bias. The MINDS collapsed what often are seen as separate dimensions of learning in order to capture a more robust underlying construct of intellectual development with which to assess undergraduate students' metacognitive states.

The context in which the need arose for ascertaining a student's metacognitive status was the collaborative learning environment, which fosters conscious intellectual development and knowledge creation through social processes (Johnson, Johnson & Smith, 1998; Powell & Kalina, 2009). By developing this collective metacognitive awareness, a student may transition from a low level of intellectual development, in which all knowledge is certain and instructors' statements and texts are meant to be memorized, towards a higher level of intellectual development, in which all knowledge is contextual and the student takes responsibility for critically examining information sources (Baxter Magolda, 1992; Felder & Brent, 2004; Marton & Saljo, 1984). While an instructor has the ability to craft a learning environment that challenges students to become aware of their learning and problem-solving skills (Mandeville, Ho & Valdez, 2017; Mandeville & Stoner, 2015), instructors commonly encounter resistance from students operating at low levels of intellectual development who feel threatened and confused when they are asked to critique and synthesize information (Felder & Brent, 2004). Adverse reactions from those in lower levels of intellectual development are similar to how those with fixed mindsets respond to challenges: those with fixed mindsets are often concerned with how they will be judged for successes or perceived failures rather than seeing a challenge as an opportunity to learn and grow (Dweck, 2006).

Understanding students' levels of intellectual development and mindset can support the instructor's ability to achieve the metacognitive goals of collaborative learning and, importantly, defuse student resistance to the method. Instructors can use this information to avoid overwhelming students with metacognitive tasks beyond their current level of intellectual development and to craft the reasonable assessment criteria for their current level of development. Furthermore, knowing students' level of intellectual development can help instructors organize peer groups in which students are well-suited to both give and receive peer assistance. Determining a student's level of development has previously been reported as assessing a student's reaction to different levels of scaffolding (Allal & Ducrey, 2000). However, it is important to note that students may have multiple levels of development, depending on subject and context. These multiple levels of development are comprised of subject-level knowledge, metacognitive practices, self-regulation, self-concept, and other features (Allal & Ducrey, 2000).

Students who are frustrated by the collaborative learning environment are likely anxious to seek validation in conventional ways and see their basic self-worth and likeability questioned if they are asked to actively engage but respond incorrectly (Covington, 2000). According to Dweck's (2006) model of self-theory, these students may have a fixed mindset in which their acquired self-belief is that their moral and intellectual qualities are determined at birth. Students with the fixed mindset may avoid learning opportunities where they risk exposing their deficiencies as this reflects negatively on their perceived self-worth. Students with this mindset have been shown to have a performance (extrinsic) goal orientation, seeking to outperform peers on summative assessments (Tagg, 2003). As the fixed mindset is intolerant to perceived failure, student interest and enjoyment in learning may be replaced with helplessness unless they experience immediate success in learning situations (Felder & Brent, 2004). Students at this level of metacognitive development may question the competence of the instructor who they believe is responsible to tell them what to know rather than helping students "figure it out."

Fortunately, one's mindset is modifiable based on the educational environment, and a progression is

possible towards the self-theory in which one believes that one's basic qualities can be developed across time—the growth mindset (Dweck, 2000; Tagg, 2003). Students with the growth mindset often believe that perceived failures are actually opportunities to cultivate knowledge. Students with this mindset have been shown to have a learning (intrinsic) goal orientation, seeking to increase their capabilities across the long term (Tagg, 2003). The belief that challenges, when met with effort and support, are an opportunity to elicit intellectual development allows students to sustain learning in the midst of real-world situations of ambiguity and failure (Dweck, 2006). Thus, instructors' ability to advance students' intellectual development via the collaborative learning environment is strongly connected to a student's underlying self-theory or mindset.

In order to advance students' intellectual development and mindset, the learning environment must provide a meaningful challenge in which students are supported to do a task they could not do independently but can accomplish with iterative formative feedback (Wass & Golding, 2014). Creating this supportive classroom environment is based on demonstrating respect for students at all levels of intellectual development and recognizing that students' zones of proximal development also vary. Another important aspect of the respectful classroom environment is avoiding overwhelming students with tasks beyond their proximal zone of development by realizing that students advance one ability level at a time. Within Vygotsky's (2012) social constructivism theory, the zone of proximal development describes learning occurring when more capable peers or instructors assist students to operate at a higher level than they could on their own. Over time, this classroom support enables students to learn to operate independently at this new ability level. Thus, to effectively advance students' intellectual development by challenging the beliefs that characterize their current level, an instructor must first understand and support students' current levels of intellectual development.

The problem is that there are limited composite measures of mindset and intellectual development available to gauge a student's current level of metacognitive development. The Motivated Strategies for Learning Questionnaire (MSLQ) by Pintrich, Smith, Garcia, and McKeachie (1993) is one popular socio-cognitive measurement tool that brings together goal orientation, task value beliefs, control beliefs, perceptions of self-efficacy, and critical thinking strategies. The MSLQ is extensive and examines many components of metacognition, but it does not incorporate mindset, or how malleable one believes one's intelligence, personality, and other characteristics to be. Therefore, our goal was to develop a concise

composite measure of mindset and intellectual development to be used to identify students' metacognitive states. In addition to being a diagnostic tool that can help instructors tailor content to students' intellectual development levels, this information could be used to chart undergraduate students' progression towards achieving the metacognitive goals of collaborative learning and also to help instructors create more productive peer work groups. Ideally, the various instructional uses of the MINDS will help instructors coach their students on becoming life-long learners with growth mindsets.

Method

Survey Administration

A development sample of undergraduate students, (n = 295, mean age = 20.2 ± 2.5 years, female = 70.7%, freshman = 31.1%, sophomore = 22.6%, junior = 21.85%, senior = 24.44%), were studied during the Spring Semester, 2017. Students were enrolled in the Department of Health Sciences at a midsized comprehensive college in the Northeast. Students who enrolled in the study completed informed consent protocols and the pilot Mindset Intellectual Development Scale (MINDS) questionnaire during the first fifteen minutes of an undergraduate course offered in the department. A member of the research team proctored the data collection while the course instructor was absent. Before completing the questionnaire, students were instructed to reply as accurately as possible as their responses would remain anonymous and would not affect their course grade. Fourteen respondents from the sample failed to complete the demographic section of the MINDS; however, their responses were included into the data set.

Survey Creation

The pilot MINDS questionnaire represented an initial attempt to condense and unify the underlying constructs of metacognition in higher education. These constructs had previously been operationalized separately in one dimensional scales and included: mindset, intellectual development, goal orientation, and self-reflection. Each of these constructs was composed of multiple construct related items, or prompts. By combining these constructs together, the initial item pool of the pilot MINDS included 37-items (Figure 1a and 1b) in which the following steps were followed for item selection.

Step 1. Items were drawn from scales previously reported in peer-reviewed sources which had satisfactory validity and internal consistency. The mindset construct was comprised of eight items, four depicting each end of the continuum of the implicit

Figure 1a.

The initial 20 items of the pilot MINDS; which were previously described as operationalizing constructs known to influence student metacognition: mindset (Dweck, 2006) and intellectual development (Baxter Magolda, 1992).

category	Item	**Mindset:**
fixed	M1	My intelligence is something very basic about me that I can't change very much.
fixed	M2	I can learn new things, but I can't really change how intelligent I am.
fixed	M5	I am a certain kind of person, there is not much that can be done to change that.
fixed	M7	I can do things differently, but the important parts of who I am can't be changed.
growth	M3	No matter how much intelligence I have, I can always change it quite a bit.
growth	M4	I can always substantially change how intelligent I am.
growth	M6	No matter what kind of person I am, I can always change substantially.
growth	M8	I can always change basic things about the kind of person I am.

category	item	**Intellectual Development:**
absolute	I1	All knowledge that matters is certain; all points of view are either right or wrong.
absolute	I2	I believe that authorities have knowledge and the responsibility to communicate it.
absolute	I3	My job is to memorize and repeat the knowledge.
transitional	I4	I believe that some knowledge is certain and some is not.
transitional	I5	I believe that authorities have responsibility to communicate certainties.
transitional	I6	I must make my own judgments regarding the uncertainties.
independent	I7	I believe that most knowledge is uncertain.
independent	I8	I take responsibility for my own learning rather than rely on authorities.
independent	I9	I believe that all knowledge is contextual and individually constructed.
contextual	I10	I take responsibility for making judgments in the face of uncertainty.
contextual	I11	I use all possible sourcces of evidence to make conclusions.
contextual	I12	I remain open to changing my conclusions if new evidence is found.

theory of intelligence: entity (fixed) vs. incremental (malleable; Dweck, 2006). The mindset scale relating to intellegence was chosen as students' implicit theories of their intelligence have been shown to predict resilience and academic outcomes when they are faced with challenging work (Blackwell, Trzesniewski & Dweck, 2007; Yeager & Dweck, 2012). Across 6 previously reported studies, measures of the implicit theory of intelligence have shown a high internal consistency (Cronbach's alpha = .94 - .98; Dweck, Chiu & Hong, 1995).

The intellectual development construct was composed of twelve items, three for each of the four stages of the continuum described by Baxter Magolda (1992). The four levels of intellectual development represent the construct of personal epistemological reflection as socially constructed and context-bound (Baxter Magolda, 2004). These levels of intellectual development emerged from an operationalizing scheme based on empirical data from more than 1,000 undergraduate students (Baxter Magolda, 2004) and have an internal consistency range of .62 - .82 (Baxter Magolda, 1988).

The goal orientation construct consisted of ten items, four each for the dichotomy (extrinsic vs. intrinsic) and one each depicting leadership and responsibility (Pintrich et al., 1993). These motivational items were based on the general social-cognitive model of motivation, specifically the value contructs which focus on the reasons why students engage academically. The intrinsic goal orientation items represent a student's focus on learning and mastery and have an internal consistency of .74, while the extrinsic goal orientation items represent a student's focus on grades and the approval of others and have a Cronbach's alpha of .62 (Pintrich et al., 1993).

The self-reflection construct was composed of seven items: four construct-related items (Aukes, Geertsma, Cohen-Schotanus, Zwierstra, & Slaets, 2007), and three validity items depicting social desirability (Ballard, 1992) so as to control for responses distorted by one's desire to present themselves as socially agreeable (Devellis, 2016). Self-reflection was described as the introspective appraisal of experience occurring as a prerequisite for reframing

Figure 1b.

The remaining 17 items of the pilot MINDS; which were previously described as operationalizing constructs known to influence student metacognition: goal orientation (Pintrich et al., 1993) and self-reflection (Aukes et al., 2007).

category	item	**Goal Orientation:**
extrinsic	G1	Getting a good grade is the most satisfying thing for me right now.
extrinsic	G4	The most important thing for me is improving my GPA.
extrinsic	G5	I want to get better grades than most other students.
extrinsic	G8	I want to do well because it is important to show my ability to my friends and family.
intrinsic	G2	I prefer course material that really challenges me so I can learn new things.
intrinsic	G3	I prefer course material that arouses my curiosity, even if it is difficult to learn.
intrinsic	G6	I want to understand the content as thoroughly as possible.
intrinsic	G7	I choose assignments that I can learn from even if they don't guarantee a good grade
general	G9	My goal is to take personal responsibility for my work.
general	G10	My goal is to take the opportunity to practise my leadership skills.

category	item	**Self Reflection & Social Desirability:**
self reflection	R1	I examine my own habits of thinking.
self reflection	R2	I am able to view my own behavior at a distance
self reflection	R7	I want to know why I do what I do.
self reflection	R8	When I read or hear a conlcusion in class, I think about possible alternatives.
soc desirabty	R3	I'm always willing to admit when I make a mistake.
soc desirabty	R5	I am always courteous, even to people who are disagreeable.
soc desirabty	R6	No matter who I'm talking to, I'm always a good listener.

one's beliefs (Aukes, Geertsma, Cohen-Schotanus, Zwierstra, & Slaets, 2007). The social desireability bias is understood as the tendency in self reports to present oneself in the best possible light at the expense of accurate reporting. The internal consistency for the self-reflection construct items has been reported to range from .83 - .74 (Aukes, Geertsma, Cohen-Schotanus, Zwierstra, & Slaets, 2007). The short form Marlowe-Crowne social desirability items' internal consistency has been reported to be .70 (Ballard, 1992).

Step 2. Each item was operationalized by assigning a five point Likert Scale (1 = strongly disagree, 5 = strongly agree) to the prompt so that students could rate how important the item was to their course work.

Step 3: The items were randomized and then divided into four groupings to increase ease of use for students.

Survey Analysis

The pilot MINDS data set was evaluated using Principal Component Analysis (PCA, SPSS) in order to determine the orthogonal dimensionality (independent dimensions) of the scale and to reduce the item number. The PCA included varimax rotations and standardized factor loading procedures which cluster items onto dimensions based on shared variance space. Pearson product moments ($p < .01$) were used to assess relationships between scale items vs. social desirability, as well as scale items vs. age, sex, and year in college.

Results

The PCA indicated that seven orthogonal components achieved threshold for retention (eingenvalues > 1) and explained 71% of the shared variance space (Table 1). The first two components explained 50.6% of the shared variance space, and diminishing returns were seen for the remaining five components, each explaining from 3.5 – 4.5% (Figure 2). Thus, the first two principal components were retained for further analysis, each representing an orthogonal dimension of undergraduate student metacognition. Decisions to retain components were made with the Taraban, Kerr, Rynearson, and Kerr (2004) criteria in mind: 1) eigenvalue is greater than one; 2) the factor accounts for a significant proportion of variance; and 3) the component is located on the curvilinear portion of the scree plot. Each had a factor loading value beyond the .3 - .35 threshold that researchers commonly use when analyzing a PCA.

Table 1
Total Variance Explained, Rotation Sums of Squares Loadings for the Seven Orthogonal Dimensions With Eigenvalues > 1.
The first two components were chosen for further analysis and explained 50.6% of the total variance from the pilot MINDS.

Eigenvalue	% Variance Explained	Cumulative % Explained
16.815	45.446	45.446
1.905	5.148	50.595
1.734	4.687	55.281
1.660	4.485	59.767
1.658	4.480	64.247
1.321	3.571	67.818
1.303	3.521	71.338

Figure 2
Scree plot of the components of the pilot MINDS in descending order of variance explained, where diminishing returns were seen after the second component.
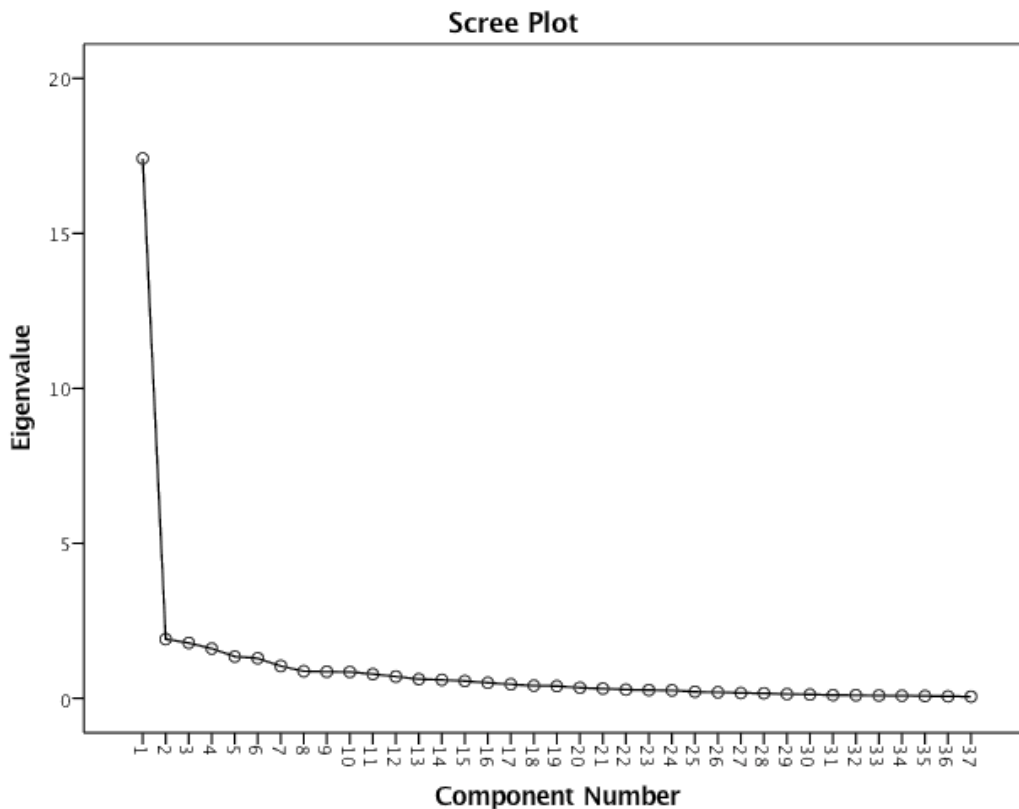
The first principal component (Table 2) explained 45.4% of the shared variance space and was composed of Intellectual Development (five items) + Self-reflection (three items) + Responsibility (one item) + Mindset (one item) + Goal orientation (one item) + Leadership (one item). Though the first principal component captures items primarily from the intellectual development dimension, the other original dimensions also merged onto this array suggesting that the underlying construct represented a broader construct of Intellectual Maturity.

The second component (Table 3) explains 5.14% of the shared variance space and was composed of four items from the original mindset dimension. Thus, the second dimension can be thought of as representing Mindset.

The results of the PCA indicate that the MINDS had two orthogonal principle components (dimensions): Intellectual Maturity and Mindset, which explained

50.6 % of the shared variance. These dimensions were composed of sixteen items (Intellectual Maturity = 12 items; Mindset = 4 items). Thus, 21 of the original 37 pilot MINDS items were removed as a result of the PCA. Further, the dimensionality of the MINDS was reduced from the original four dimensions to two orthogonal dimensions.

Pearson's correlations ($p < .01$) of social desirability vs. Intellectual Maturity items indicate that 5 items were significantly and strongly related: I7 (r = .662), R1 (r = .759), I6 (r = .709), M3 (r = .478) & R7 (r = .746). These items were removed from the scale as they were strongly confounded by the social desirability bias. Two items showed no significant correlation to social desirability: R8 (r = .062) & I5 (r = .136). Five items showed significant ($p < .01$) but weak correlations to social desirability: I12 (r = .265), G3 (r = .168), G10 (r = .187), I10 (r = .192) & G9 (r = .234). These items were retained, but the Intellectual Maturity component should be interpreted with caution as social desirability influenced student responses to a weak degree. Pearson's correlations of social desirability vs. items from Mindset indicate that item M2 was significantly and strongly related (r = .500) and was removed from the scale due to the confound of the social desirability bias. Inclusion of items of the Intellectual Maturity component which were weakly correlated to social desirability was tolerated as the amount of overlap of the constructs was minimal and future interpretation of average tendencies and individual differences of the MINDS will control for this confound by including an item representing this bias.

Therefore, assessing the relationship of social desirability to the two orthogonal dimensions of MINDS indicated that six of sixteen items are strongly influenced by social desirability and were discarded, leaving a ten item, two-dimension scale of mindset and intellectual maturity. The final version of Intellectual Maturity includes the following seven items: intellectual development (I5, I10, I12) + goal orientation (G3) + responsibility (G9) + leadership (G10) + self-reflection (R8). The final outlay of Mindset includes the following 3 items: mindset (M6, M7, M8). An item representing social desirability (R5) was included for future control purposes, bringing the final total of MINDS items to eleven (Figure 3).

Correlations of the final eleven MINDS items to student age, sex, and year in college indicated that the first principle component, Intellectual Maturity, was significantly ($p < .01$) but weakly correlated to: age (I12, r = .163), sex (I12, r = .156), and year in college (G3, r = .162). Age and year in college had positive correlations with Intellectual Maturity, and women scored significantly higher than men on the Intellectual Maturity component. The second principle component, Mindset, was not found to correlate to age, sex, and year in college.

Table 2

The Rotated Factor Loadings for the First Principal Component, Intellectual Maturity, Which Show the Constituent Items and the Strength of Their Relationship.

Item	Factor Loading
Goal - respns G9	.954
Indev - cont I10	.938
Indev - trans I6	.932
Mind - grow M3	.927
Indev - ind I7	.923
Indev - cont I12	.916
Goal - intr G3	.915
Selfrefl R1	.913
Goal - ldrsh G10	.912
Indev - trans I5	.883
Selfrefl - crthk R8	.877
Selfrefl R7	.864

Table 3

Rotated Factor Loadings of the Second Principal Component, Mindset, Which Show the Constituent Items and the Strength of Their Relationship.

Item	Factor Loading
Mind - fixed M5	.634
Mind - fixed M7	.614
Mind - fixed M2	.419
Mind - grow M8	-.536

Figure 3

The Final 11 - item Mindset, Intellectual Development Scale (MINDS) Including Two Orthogonal Dimensions: Mindset (Q1 – 3) and Intellectual Maturity (Q4 – 10), as well as, a Social Desirability Control Question (Q11).

Instructions: mark to the right of each statement how important it is to your college course work.

Q		Item	strongly disagree	disagree	no opinion	agree	strongly agree
1	M6	No matter what kind of person I am, I can always change substantially.	1	2	3	4	5
2	M7	I can do things differently, but the important parts of who I am can't be changed.	1	2	3	4	5
3	M8	I can always change basic things about the kind of person I am.	1	2	3	4	5
4	I5	Authorities have responsibility to communicate certainties.	1	2	3	4	5
5	I10	Students take responsibility for making judgments in the face of uncertainty.	1	2	3	4	5
6	I12	Students remain open to changing their conclusions if new evidence is found.	1	2	3	4	5
7	G3	I prefer course material that arouses my curiosity, even if it is difficult to learn.	1	2	3	4	5
8	G9	My goal is to take personal responsibility for my work.	1	2	3	4	5
9	G10	My goal is to take the opportunity to practise my leadership skills.	1	2	3	4	5
10	R8	When I read or hear a conclusion in class, I think about possible alternatives.	1	2	3	4	5
11	R5	I am always courteous, even to people who are disagreeable.	1	2	3	4	5

Discussion

The purpose of developing a practical composite scale to assess undergraduate student mindset and intellectual development was to have a tool to effect positive change in their metacognitive state, as well as to defuse resistance to collaborative learning. The unique contribution of the MINDS is that it offers educators a concise composite measure of mindset and intellectual maturity to be used to identify students' metacognitive states. The MINDS was shown to capture mindset and intellectual maturity dimensions independently, which is consistent with Dweck's idea that one's self-theory underlies one's many attributes (2006).

Of interest was the formation of the Intellectual Maturity dimension from the merging of the Pintrich's (1993) construct of goal orientation and Baxter Magolda's (2004) construct of personal epistemology (intellectual development). The collapsing of these constructs makes sense given the previously described link between students' intellectual development and their goal orientation (Felder & Brent, 2004). In addition, the merging of items into one dimension avoids the multicollinearity problems of highly related subscales. Thus, the MINDS dimension of Intellectual Maturity was seen to uniquely capture variance related to a robust description of a student's metacognitive development, which includes both their intellectual development and goal orientation.

The self-reflection items of the Intellectual Maturity component assess students' attitudes toward authorities and their roles in critiquing information to draw conclusions (Sobral, 2005). Students displaying these metacognitive attributes embrace challenges as opportunities while assuming responsibility for the outcomes of the decisions they make in their learning journey. These metacognitive traits would enable students to adjust to the active role of collaborative learning and minimize their fear and resistance to education paradigms beyond the traditional passive role (Terenzini, Cabrera, Colbeck, Parente & Bjorklund, 2001). Ideally, through collaborative learning experiences, students will take agency over their learning, engage in critical thinking processes, and embrace the opportunity to be life-long learners (Springer, Stanne & Donovan, 1999). As the MINDS captured core metacognitive aspects of Intellectual Maturity, it may serve to document and foster students' intellectual development in the collaborative learning environment.

Metacognitive knowledge (Dunn, Lo, Mulvenin & Sutlcliffe, 2012) is defined as the awareness students have about themselves which informs both a current task, as well as the students conceptions of themselves as learners and problem solvers (Desautel, 2009; Zepeda, Rickey, Ronevich & Nokes-Malach, 2015). Gathering, processing, and incorporating new information can be seen as the constant in a learning situation rife with uncertainty. A learner needs to be comfortable with that process if the learner is to progress along the stages of intellectual development (Baxter Magolda, 1992). Experts, educators, facts, and theories do not provide answers (as we see in epistemic stages of absolute and transitional, knowing Baxter Magolda, 1992); rather, they are inputs in the feedback loop that an intellectually mature learner draws from. In this way, the MINDS may assist students in advancing towards the goal of becoming contextual knowers who operate at a high level of intellectual development. In addition, students may be able to ascertain their mindset using the MINDS and be able to develop confidence in their abilities to solve new problems and tackle new educational challenges.

The MINDS scale may also help instructors reach their students by better understanding the impact of the Mindset construct that emerged from the PCA, which does not reference intelligence. The three Mindset items focus on being able to change the kind of person one is or the important parts of who one is, what Dweck (2006) calls the personality mindset (compared to the intelligence mindset). These broader constructs of mindset represent a flexible self-concept that transcends intelligence. Participants who viewed themselves as able to change have more agency over their self-concept and likely feel they have agency over their experiences and circumstances; thus, they have a growth mindset.

Because the initial item pool was grounded in scales previously reported in the literature and due to the plausible theoretical explanation for the two orthogonal dimensions, we believe that MINDS has the necessary construct validity for capturing two independent metacognitive dimensions which elucidate undergraduate students' frame of mind and comfort with learning. While the internal consistency of the items used in the MINDS has been previously reported as acceptable, a limitation of the present study is that both the predictive validity and the test-retest reliability of the MINDS remains unknown. Future longitudinal study is needed to determine how well one's MINDS score predicts an academic outcome such as a course grade or critical thinking. Additional work is need to assess the stability of one's Mindset score (perhaps across various abilities), as well as how modifiable it is to collaborative learning. We have demonstrated and attempted to control for the social desirability response bias; however, it is likely that other confounds exist for the MINDS as 50% of the variability remains unexplained. Because the results of the MINDS generalize to undergraduate Health Science students, future work is required to know if it captures metacognitive constructs for students of different sexes, age groups, and majors.

In spite of these limitations, we believe the value of the MINDS remains as an assessment of a student's current metacognitive state so as to group students for collaborative learning, develop scaffolding criteria for the zone of proximal development, and to assess the student's intellectual development across time. The MINDS is a concise assessment which can be given in class and takes approximately 15 minutes. However, future work is required to clarify the meaning of the MINDS scores by determining item response values for students grouped by cognitive performance. Pending such clarification, caution is urged when implementing and interpreting the MINDS.

Conclusion

The eleven-item, two-dimensional Mindset and Intellectual Development Scale (MINDS) captured a Mindset construct independently from an Intellectual Maturity construct while controlling for the social desirability response bias. The Intellectual Maturity dimension collapsed several different constructs of metacognition including intellectual development, goal orientation and self-reflection, suggesting a robust representation of the construct.

Thus, the MINDS may serve as an assessment of a student's self-appraisal of their learning, information which can be used to develop a student's personal theory (Dweck, 2000), as well as provide for the opportunity for the purposeful review of a student's intellectual development as a learning outcome.

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Experiences of the Teaching-Learning Environment and Approaches to Learning: Testing the Structure of the "Experiences of Teaching and Learning" Inventory in Relation to Earlier Analyses

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This study examines the structure of the inventory, the second part of the Experiences of Teaching and Learning Questionnaire (ETLQ). Three hundred and sixty-four students participated in the study. To strengthen the validation of the ETL, the short version of Approaches to Learning included in the ETLQ was substituted by its widely-used, full-version Approaches and Study Skills Inventory for Students (ASSIST). Exploratory and confirmatory factor analyses tested the factor structure of the inventory. Twenty questions covered four factors: "Congruence and coherence in course organization," "Teaching for understanding and encouraging learning," "Support from other students," and "Integrative learning and critical thinking". Appropriate associations between these factors and (a) the subscales comprising the deep, surface, and strategic scales (b) acquired knowledge, generic skills, and (c) self-evaluation supported the validation of the instruments. The factors seem highly similar to those reported in previous studies and Cronbach coefficients were appropriate. The study suggests the ETL as a valuable instrument to be used across cultures and different contexts.

Introduction

During the last three decades the educational literature has focused on the effect of the academic environment on how students learn and, recently, on the importance of powerful teaching-learning environments that can be expected to cultivate and reward students' understanding (McCune & Entwistle, 2011). These studies belong in the tradition of the development of student-centered environments that enhance students' learning (Biggs & Tang, 2011). Most of the studies carried out in the research tradition of student learning have used self-report instruments which emerged from research that has been carried out by research centers in higher education in various countries (e.g. in the UK, Belgium and Finland). These research groups were aiming at finding ways of improving the quality of learning in higher education and also of making links with academic achievement. Students' approaches to learning appear at the heart of all these studies and are being seen as an important construct in considering effective teaching and course design (Diseth, 2007; Gijbels, Segers, & Struyf, 2008). Approaches consist of a complex entity involving both the ways of studying generally adopted by students and their experiences of the academic environment. Among the most widely used research instruments to evaluate the learning context and approaches to learning are those developed by the Edinburgh group (e.g., Entwistle, 2009; Entwistle & Ramsden, 1983; the ETL project, see http://www.etl.tla.ed.ac.uk). The present study provides indications of the use of the "Experiences of Teaching and Learning" (the second part of the Experience of Teaching and Learning Questionnaire, ETLQ) as a valid instrument that explores students' experiences of

the environment, associations among the dimensions of the learning environment, and approaches to learning, acquired knowledge, generic skills, and self-evaluation, and thus supports the validity of the "Experiences of Teaching and Learning Inventory" (ETL) inventory.

Perceptions of the Learning Environment and Approaches

The educational literature discusses three major approaches: deep, surface, and strategic (Entwistle, McCune, & Walker, 2001). These concern either the development of personal meaning (deep approach), the routine memorization and unreflective study strategies to cope with exam demands (surface approach), or the use of strategies to achieve high grades (strategic approach). The central idea was the distinction between deep and surface approaches to learning (Marton & Säljö, 1976), which differentiated the student's intentions (to understand for oneself or to reproduce material for the teacher or examiner) and the learning processes used to fulfill those intentions (Marton, 1975; Marton, Hounsell, & Entwistle, 1984). Intention (a concept equivalent to motivation) is expressed in one of the subscales for each approach; the remaining subscales depict the relevant processes. In particular, seeking meaning, achieving, and fearing failure correspond to deep, strategic, and surface approaches respectively.

A range of studies has shown that students' experiences of the academic context have a crucial influence on approaches to learning. A positive perception seems to be positively related to a deep approach and negatively related to a surface approach to learning (Baeten, Kyndt, Struyven, & Dochy, 2010;

Karagiannopoulou & Milienos, 2013; Karagiannopoulou & Christodoulides, 2005; Kreber, 2003; Lawless & Richardson, 2002; Parpala, Lindblom-Ylänne, Komulainen, Litmanen, & Hirsto, 2010; Richardson, 2005; Richardson & Price, 2003; Sadlo & Richardson, 2003). For example, inappropriate assessment has been positively correlated with the surface approach (Lizzio, Wilson, & Simons, 2002; Marton & Säljö, 1997; Trigwell & Prosser, 1991a). Also, Sadlo and Richardson (2003) found that clear goals and standards and appropriate assessment are negatively correlated with any of the aspects comprising the surface approach. Lizzio et al. (2002) and Karagiannopoulou and Christodoulides (2005) found that students' perceptions of good teaching influence the deep approach to learning. However, research has failed to indicate a consistent relationship between a deep approach and positive perceptions of the academic context (e.g., good teaching; see Asikainen & Gijbels, 2017; Entwistle, 2009). Recent studies have indicated that the perceived quality of teaching tends to be positively correlated with deep and strategic approaches and negatively correlated with a surface approach (Diseth, 2007; Diseth, Pallesen, Brunborg, & Larsen, 2010). Diseth, Pallesen, Hovland, and Larsen (2006) presented a model in which "good teaching" predicted deep, surface (negative relation) and strategic approaches to learning, whereas "clear goals and standards" predicted a strategic approach while "appropriate workload" predicted both deep and surface approaches. All these elements should be accounted from the constructive alignment perspective (Biggs, 1996; Biggs & Tang, 2011), ensuring that teaching, assessment, and every aspect of the teaching-learning environment are aligned to constructivist principles of learning (Xu, 2004). From this perspective, the development of a questionnaire that explores the aspects of the environment that seems most likely to affect students' engagement with studying and learning (Entwistle, McCune, & Hounsell, 2003) appears of crucial importance for our understanding of effective teaching.

Besides, some qualitative studies have suggested the idea of a "meeting of minds" as a cognitive-emotional experience (Karagiannopoulou & Entwistle, 2013). Experiences of tutors who are passionate for their subject, authentic, supportive, and encouraging of students' learning seem to come along with personal understanding (Entwistle, Karagiannopoulou, Ólafsdóttir, & Walker, 2016); and experiences of negative nature seem to regress students in their learning (Karagiannopoulou, 2010; Karagiannopoulou & Entwistle, 2015).

Experiences of the Teaching-Learning Environment and Achievement

Few studies have found a positive correlation between an overall measure of experiences of the learning environment and assigned marks for coursework (Richardson & Price, 2003) or between GPA and good teaching (Lizzio et al., 2002; Karagiannopoulou & Christodoulides, 2005; Karagiannopoulou & Milienos, 2015). Most recent studies indicate (Diseth, 2007; Karagiannopoulou & Milienos, 2015) a significant correlation between examination grades and teaching quality and appropriate workload, but this relation was not confirmed by techniques of structural equation modeling, nor did it include measures of approaches to learning.

The Experiences of Teaching and Learning Questionnaire

The ETL, the validity of which is tested in the present study, is the second part of the ETLQ that has drawn on Student Learning Research. It was developed as a part of the research project, "Enhancing teaching-learning environments in undergraduate courses" (the ETL project; see http://www.etl.tla.ed.ac.uk), which investigated ways in which findings from research could be used to create a learner-centred learning environment for students (Entwistle et al., 2003). To develop the questionnaire an extensive review of the literature and also an analysis of earlier inventories measuring students' perceptions of teaching and of learning environments were carried out by a range of researchers (Entwistle, 2003; Entwistle, McCune, & Hounsell, 2002; Steis, Maeyer, Gijbels, & Van Petegem, 2012).

The ETLQ has five sections. In particular, the first section is the Approaches to Learning and Studying Inventory (not used in the present study). The second part, ETL, covers the students' perceptions of the teaching and learning they had experienced on the course unit. The third section (not used in the present study), Demands Made by the Course Unit, asks about the demands that students felt the course unit made in terms of knowledge requirements and learning processes. The fourth section, What You Learned from This Course Unit, paralleled those aspects in relation to what they felt they had actually gained from the unit, i.e., concerning knowledge and generic skills, and this section has been used in the present study as an outcome variable. The last section was a single item asking students how well they had felt they had done in the courses they had taken (self-evaluation); this has been used in the particular study as an outcome.

The second part of the ETLQ, Experiences of Teaching and Learning (ETL), which is at the heart of this study (testing each validation) consists of four subscales namely: Organization and Structure, Teaching and Learning, Students and Teachers, and Assessment and Other Set Work. Entwistle et al. (2003) and Xu (2004) reported that the most consistent set of substantial correlations relate all but one (peer support) of the perceptions subscales to students' ratings on the

knowledge the students believed they had achieved, and most of these subscales also relate to students' ratings of gains in their processes of learning. Concerning self-rating of attainment, Xu (2004) found that most of the subscales (except "student support" and "assessment for understanding") included in students' perceptions of the teaching-learning environment were correlated with a self-rating of attainment. Concerning associations between perceptions and approaches, all studies indicate that positive experiences link to deep and strategic approaches (Entwistle et al., 2003; Parpala, Lindblom-Ylänne, Komulainen, & Entwistle, 2013; Xu, 2004). However, the results are not consistent. Xu (2004) found strong patterns only for the deep approach, with "Assessing for Understanding" and "Teaching for Engagement in Studying" being the strongest. Entwistle et al. (2003) found that the strongest patterns showed associations of deep and surface approach with the perceptions; the highest values show a deep approach associated with "Encouraging Learning and Assessing Understanding" while a surface approach was associated with "(Lack of) Interest Evoked." Concerning the strategic subscales, "Monitoring studying" was most closely associated with "Encouraging learning," "Assessment feedback," "Assessing understanding," and "Staff support"; a similar, but less strong, pattern was found for organized studying and effort management (strategic subscales). In the same line, Parpala et al. (2013) reported strong positive correlations among a "Deep approach," "Organized studying," "Intention to understand," and all of the six factors reflecting students' perceptions of the teaching-learning environment ("Teaching for understanding," "Alignment," "Staff enthusiasm and support," "Interest and relevance," "Constructive feedback," and "Support from other students"). They also reported negative correlations of the six factors with a surface approach with the strongest patterns to show links between surface approach and "Teaching for understanding" and "Alignment." The strongest positive and negative correlation of experiences with deep and surface approaches concerned "Interest and relevance." Overall, the research findings are in the same line while slight variations are due to heterogeneity of the sample or to different cultures. In line with Parpala et al.'s (2013) findings, Herrmann, Bager-Elsborg, and Parpala (2016), using the LEARN questionnaire (based on the ETL), found relations between all of the factors of the learning environment with the three approaches with the strongest patterns to concern the deep and strategic approach (organized effort).

There are only a few studies (Entwistle et al., 2003; McCune, 2003; Parpala et al., 2013; Xu, 2004) that have explored the factor structure of the ETL questionnaire (included in the ETLQ), all of which report various challenges (e.g., Parpala et al., 2013; Steis et al., 2012). Although most of the studies seem to indicate a conflicting factor structure, a close look at them indicate high similarity. In particular, Entwistle et al. (2003) suggest a five-factor structure in a UK sample: "Organization and structure," "Encouraging learning," "Assessment and assignments," "Supportive climate," and "Evoking interest." Xu (2004) in a Chinese sample of undergraduate students also reports five factors: "Engagement," "Supportiveness," "Understanding," "Challenge and support," "Clarity and choice," and "Assessment focus." More recent studies suggest a six factor solution. Entwistle (2009) identifies the following factors: "Congruence and coherence in the course unit as a whole," "Teaching for understanding," "Staff enthusiasm and support," "Constructive feedback," "Support from other students," and "Interest and enjoyment generated by the course." A recent study (Parpala et al., 2013), where both UK and Finnish data were analyzed, suggests a short version (that includes 21 items from the ETL) with a six factor solution, namely, "Teaching for understanding," "Alignment," "Staff enthusiasm and support," "Interest and relevance," "Constructive feedback," and "Support from other students." Most recently, Herrmann et al. (2016) confirmed the factor structure of this Finnish version of the ETL, with a Danish sample. Also, Rytkonen, Parpala, Lindblom-Ylänne, Virtanen, and Postareff (2012) used the Finnish version of 21 items and suggested four factors: "Relevance and evoking interest, Constructive feedback, Peer support and Alignment." This version ended up to a further reduced and modified version by Asikainen, Parpala, Lindblom-Ylänne, Vanthournout, and Goertjens (2014); they suggested a factor, "Teaching for understanding," to be comprised by items identical to those in the "Relevance and invoking interest" mentioned by Rytkonen et al. (2012). Besides, Steis et al. (2012) confirmed the factor structure of a shortened (25-items) version of the ETL. However, they had failed to confirm the full version (40 items). They suggested a six-factor structure, namely, "Aims and congruence; Teaching for understanding; Assessing understanding; Staff enthusiasm and support; Student support; and Interest and enjoyment."

In spite the diversity in factor structure of the ETL, Parpala et al. (2013) have reported it as a robust and reliable instrument for use across countries at either the degree level or the single course module level; they note though that the psychometric properties remain to be further explored.

The present study aims to test the factor structure of a translated version of part 2 (ETL) of the Experiences of Teaching and Learning Questionnaire (ETLQ), consisting of 40 items (Entwistle, 2005). Furthermore, the validation of the ETL was tested by the use of Approaches and Study Skills Inventory for Students (ASSIST, http://www.etl.tla.ed.ac.uk) instead of its short version included in the ETLQ, used in previous studies

(e.g. Parpala et al., 2013). The use of the full version of the instrument that measures approaches to learning (ASSIST), instead of the short one included in the ETLQ, draws on the "open" discussion about the accurate measuring of students' approaches by short versions in different contexts and disciplines. Also, this decision draws on the difficulty of the questionnaires to grasp the nuanced picture of students' learning, particularly where they focus on specific aspects of any approach, which is often the case with the short versions of the questionnaires. The ASSIST has been a widely-used instrument with good psychometric qualities explored by a range of studies (see Diseth, 2001; Karagiannopoulou & Milienos, 2013); most of the studies report psychometric assets and raise very few limitations. On the other hand, the short version of it (the ALSI included in the ETLQ) has been used in a small number of studies, and recent updated short versions of the ASSIST (see Entwistle, 2009) seem to raise an issue of the appropriateness of the ALSI as a "strong" short version (of the ASSIST). Moreover, the ASSIST has been checked for its psychometric characteristics, in this particular sample, in a previous study (Karagiannopoulou & Milienos, 2013).

In particular, the present study tests the factorial structure of the ETL and explores its associations with (a) approaches to learning at a subscale level explored by ASSIST (b) knowledge and generic skills acquired, and (c) self-evaluation; the (b) and (c) are included in the ETLQ. In line with the use of the ASSIST, associations with outcomes were used to support validation since, apart from the very first ones listed above, there is a lack of studies indicating links between ETL and outcomes. Associations between the above variables (if similar to original research) would lend strength to the appropriateness of the use of the instrument in a different culture, especially in a context where evaluations are not necessarily welcome and research in students' learning is scarce. We assume that the expected associations among ETL, approaches to learning, knowledge acquired, skills acquired and self-evaluation, will support the use of this instrument across cultures as a robust one. The good psychometric properties of the ETL on a sample of students who are not familiar with reflections on their learning and academic environment, in terms of evaluation in Higher Education, will further support the validity of the instrument.

Method

Participants

The sample consists of 364 undergraduate students (97 first-year, 91 second-year, 75 third-year, and 101 fourth-year students) studying in a Department of Philosophy, Education, and Psychology. The average age was 20.42 years (sd=1.88) and the majority were female (88.1%). The number of students participating in the current study is similar, although a bit smaller, to that reported by Entwistle et al. (2003) and Xu (2004).

Instruments

ETLQ. The study focuses on the validation of part 2 of the ETLQ (for the relevant project, see http://www.etl.tla.ed.ac.uk) that explores ETL. Other sections of the ETLQ used in the present study are the following: the knowledge and generic skills acquired and self-evaluation. The ETL consists of 40 items that correspond to four subscales: Organization and Structure (e.g., The topics seemed to follow each other in a way that made sense to me), Teaching and Learning (e.g., We were encouraged to look for links between the courses), Students and Teachers (e.g., I enjoyed being involved in this course unit), and Assessment and other set work (e.g., I could see how the set work fitted in with what we were supposed to learn). In the present study only 31 out of the 40 items were used as relevant to the syllabus of the particular department (see Table 1). The exclusion of so many items met the need to get valid answers by the students since the experience of evaluation questionnaires used by the particular institution revealed many of the students to quit or just skim through the questionnaires in case they came across a number of questions irrelevant to the particular course they attended. As a result, we decided to keep a "tight" version of the ETL that directly fit to their experiences.

Items 3, 5, 10, 14, 20, 32, 35, 37, 40 (32-40 in our version; see the last part of Table 1) from the original questionnaire were not included in the version we used because they were viewed as irrelevant to the department. In particular, they concerned (a) student's choice over the material they had to study (32, 33 in our version; see also Herrmann et al., 2016) (b) different types of teaching in the context of a particular course and the use of web pages (35, 36 in our version) (c) aspects of encouragement that effectively improve students' learning and performance in the particular course (34, 37 in our version) and (d) forms of assessment and constructive feedback on any set work that had to be submitted (38, 39, 40 in our version). All of these items depict inherent differences underlying the Greek and the UK higher education. For example, Greek social science students almost never get (a) different types of teaching (lectures is almost always the case), (b) compulsory set-work, and (c) systematic feedback. Moreover, students do not refer to an academic advisor and are not expected to have consistent contact with a tutor (there is not course tutor in undergraduate studies).

Table 1
Experiences of Teaching and Learning Questionnaire

	Items from the original scale included in the present study
	Congruence and coherence in course organization (mean=15.40, sd=3.96, a= .69)
1	It was clear to me what I was supposed to learn in courses. (MSA[a]=0.775)
2	The topics seemed to follow each other in a way that made sense to me. (MSA=0.848)
3	The course unit was well organized and ran smoothly. (MSA=0. 882)
4	What we were taught seemed to match what we were supposed to learn. (MSA=0.861)
5	It was clear to me what was expected in the exams. (MSA=0.794)
	Teaching for understanding and encouraging learning (mean=43.9, sd=9.2, a=.85)
6	We were encouraged to look for links between the courses. (MSA=0.916)
7	I can imagine myself working in the subject area covered by the courses I have been taught. (MSA=0.836)
8	On most of the courses, I was prompted to think about how well I was learning and how I might improve. (MSA=0.88)
9	I could see the relevance of most of what we were taught in the courses. (MSA=0.922)
10	We weren't just given information; staff explained how knowledge is developed in this subject. (MSA=0.912)
11	The teaching encouraged me to rethink my understanding of some aspects of the subject. (MSA=0.92)
12	Plenty of examples and illustrations were given to help us to grasp things better. (MSA=0.889)
13	Courses have given me a sense of what goes on "behind the scenes" in this subject area. (MSA=0.913)
14	Teaching helped me to think about the evidence underpinning different views. (MSA=0.947)
15	Teaching encouraged me to relate what I learned to issues in the wider world. (MSA=0.948)
16	Staff were patient in explaining things which seemed difficult to grasp. (MSA=0.891)
17	Students' views were valued in courses. (MSA=0.923)
18	Staff helped us to see how you are supposed to think and reach conclusions in this subject. (MSA=0.937)
	Support from other students (Items included in the questionnaire used in the present study concerned Experiences and Support from either students or teachers) (mean=23.0, sd=5.29, a=.73)
19	Students supported each other and tried to give help when it was needed. (MSA=0.799)
20	I found most of what I learned in courses really interesting. (MSA=0.93)
21	Staff tried to share their enthusiasm about the subject with us. (MSA=0. 929)
22	Talking with other students helped me to develop my understanding. (MSA=0.843)
23	I enjoyed being involved in this course unit. (MSA=0.941)
24	I found I could generally work comfortably with other students. (MSA=0.763)
25	Courses provided plenty of opportunities for me to discuss important ideas. (MSA=0.905)
	Integrative learning and critical thinking (mean=22.96, sd=4.19, a=.70)
26	The handouts and other materials we were given helped me to understand the courses. (MSA=0.9)
27	I could see how the set work fitted in with what we were supposed to learn. (MSA=0.823)
28	You had really to understand the subject to get good marks in most of the courses. (MSA=0.827)
29	Doing the set work helped me to think about how evidence is used in this subject. (MSA=0832)
30	To do well in courses, you had to think critically about the topics. (MSA=0.854)
31	The set work helped me to make connections to my existing knowledge or experience. (MSA=0.866)

	Items from the original scale excluded in the present study
32	We were given a lot of choice over what we went about learning
33	We were allowed some choice over what aspects of the subject to concentrate on
34	On this unit, I was prompted to think about how well I was learning and how I might improve
35	The different types of teaching (lectures, tutorials, labs etc) supported each other well
36	The web pages provided by staff helped me to understand the topics better
37	I was encouraged to think about how best to tackle the set work
38	The feedback given on my work helped me to improve my ways of learning and studying
39	Staff gave me the support I needed to help me to complete the set work for this course unit
40	The feedback given on my set-work helped to clarify things I hadn't fully understood.

[a] Measure of Sampling Adequacy

The fourth section focuses on "What was learned from the course" (eight questions). In the present study, only the questions focused on (a) Knowledge and subject-specific skills (three questions, e.g. knowledge and understanding about the topics covered) and (b) Generic skills (three questions, e.g. ability to work with other students) were included. The two questions focused on information skills were excluded as inappropriate. Again, answer scores were added for the two subscales.

At the end of the questionnaire, students were asked to rate themselves objectively based on the marks, grades, and comments they had been given in the course of their studies (self-evaluation). Answers were ranged from 1 (badly) to 9 (very well).

ASSIST

ASSIST consists of three sections, and the second addresses "Approaches to Studying." The "Approaches to Studying" included in the ASSIST is a more recent version of the Approaches to Studying Inventory (ASI) originally developed by Entwistle and Ramsden (1983), which has been used in a large number of studies. The 52-item instrument, used in the pre-set study, includes three main scales measuring a deep approach, a surface approach, and a strategic approach to learning. The deep approach consists of four subscales: seeking meaning (e.g., Before tackling a problem or assignment, I first try to work out what lies behind it), relating ideas (e.g., I try to relate ideas I come across to those in other topics or other courses whenever possible), use of evidence (e.g., I look at the evidence carefully and try to reach my own conclusion about what I'm studying), and interest in ideas (e.g., Regularly I find myself thinking about ideas from lectures when I'm doing other things). The surface approach consists of four subscales: lack of purpose (e.g., Often I find myself wondering whether the work I am doing here is really worthwhile), unrelated memorizing (e.g., I find I have to concentrate on just memorizing a good deal of what I have to learn), syllabus-boundness (e.g., I tend to read very little beyond what is actually required to pass) and, fear of failure (e.g., Often I feel I'm drowning in the sheer amount of material we're having to cope with). The strategic approach consists of five subscales: organized study (e.g., I manage to find conditions for studying which allow me to get on with my work), time management (e.g., I organize my study time carefully to make the best use of it), alertness to assessment demands (e.g., When working on an assignment, I'm keeping in mind how best to impress the marker), achieving (e.g., It's important to me to feel that I'm doing as well as I really can on the courses here) and, monitoring effectiveness (e.g., I go over the work I've

done carefully to check the reasoning and that it makes sense). Although most studies have good psychometric properties, for all of the three scales and the subscales consisting each of them there are limitations in the use of two of the strategic subscales. "Alertness to assessment demands" and "Monitoring effectiveness" subscales, included in the strategic approach, seem to load inappropriately (e.g. Byrne, Flood, & Willis, 2004; Diseth, 2001; Valadas, Goncalves, & Faisca, 2010), suggesting the exploration of the validation of the questionnaire for each particular sample. Such a limitation has been associated with different experiences of students through the years of study. Besides, the Cronbach's reliability coefficients of some of the subscales were relatively low, but were expected in case of psychological constructs (Byrne et al., 2004; Diseth, 2001; Karagiannopoulou & Christodoulides, 2005; Kreber, 2003; Valadas et al., 2010).

Procedure

A standard translation back procedure ensured that the meaning of each statement was expressed in the Greek version of the scales. Two social science academics who had graduated from UK Universities translated the questionnaire into Greek. A Greek lecturer who had been working in a UK University for a long time back-translated the questionnaire. The academics involved in the translation clarified differences in wording. In the Greek version of the questionnaire, the "Experiences of Teaching and Learning" (2nd section of the ETLQ) and the "What You Learned from This Course Unit" (4th section of the ETLQ) maintained the original structure. The students answered the questions with reference to the overall courses they had attended during their study in the particular department. The original scale referred to a particular course module. However, Parpala et al. (2013) clearly suggest the appropriateness of the use of the questionnaire at the degree subject level. In the present study, the questionnaires were printed and distributed during psychology lectures in the second academic semester. Students were asked to respond to the items using the same scale as in the original ETLQ.

Statistical Analysis

Exploratory (EFA) and confirmatory factor analysis (CFA) explored the properties of ETLQ. We randomly divided the sample into two equal parts; we contacted an EFA on the first half of our sample and confirmed (using CFA) the derived factor solution on the other half (for the appropriateness of this approach, see, e.g. Gerbing & Hamilton, 1996; Byrne, 2010; Kline, 2011; Raykov & Marcoulides, 2006;

Figure 1
The Scree plots with the random eigenvalues (Parallel Analysis)
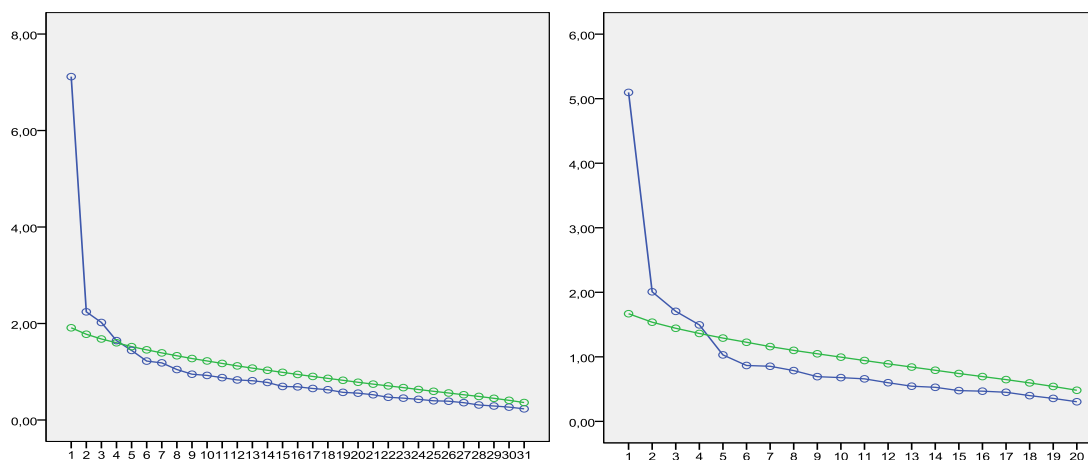
Worthington & Whittaker, 2006; the study uses SPSS and Amos for the data analysis).

Results

First, we explored the Cronbach's Alpha reliability coefficients for the four subscales "Congruence and coherence in course organization" (α=0.69), "Teaching for understanding and encouraging learning" (α=0.85), "Support from other students" (α=0.73), and "Integrative learning and critical thinking" (α=0.70). The reliability coefficients for two of the subscales were considered acceptable (0.85 and 0.73; e.g. Nunnally & Bernstein, 1994), while the remaining were of moderate level (note also that these two subscales consist of fewer variables; see Table 1).

EFA and CFA

An orthogonal model using the Principal Axis Factoring (PAF; e.g. Kahn, 2006) extraction method on the correlation matrix explored the factor structure of the ETLQ. The PAF extraction method, along with a Promax (oblique) rotation, contributed to the analysis; no "extreme" outliers were detected. The Principal Component (PC) is also an appropriate extraction method, and most of the time these two methods, i.e., PC and PAF, offer equivalent results, particularly if there are high correlations among the items, the number of items is large, or the number of common factors is small (e.g., Johnson & Wichern, 2002; Rencher, 1995). KMO equals 0.83 and therefore meets most of the proposed acceptable values (e.g., Kaiser, 1974). The Measures of Sampling Adequacy of our items range from 0.763 to 0.948 (Table 1) and therefore are sufficient for our purposes.

The 8 factors (deduced by the Kaiser rule) explain the 57.8% of data variability. Note that Kaiser rule often overestimates the number of factors (especially when the number of items is large, (e.g., Kahn, 2006), and hence it is necessary to consider other decision rules, as, for example, the scree test and parallel analysis. The scree plot (Figure 1a) does not support the existence of 8 factors; parallel analysis (e.g. Horn, 1965) suggests retaining 4 factors since the fifth eigenvalue is the first (real) smaller eigenvalue than the corresponding random (simulated) eigenvalue. Furthermore, according to the pattern matrix of the eight-factor model, it can be seen that at most two items load on the last four factors; this fact also supports the existence of four underlying factors.

Hence, the next step is to study a model with 4 factors, which explains the 34.7% of the total variance. The pattern and structure matrix of this model (not included here due to space limitations) reveal that items 4, 7-9, 20, 21, and 23 do not load on any factor (loadings<0.35 or have low cross-loadings); therefore, these seven items should be excluded from our 4 factor model. Note also that the items 25-28 have very low loadings (less than 0.40) and these loading become smaller (i.e. less than 0.35) after the exclusion of the above seven items; thus, these 4 items are also excluded from our analysis.

The new model (without the above 11 items) explains now the 40.2% (Table 2) of the variance, while the four factor solution is supported again by the parallel analysis and to some extent, by the scree plot (Figure 1b). The new Cronbach's Alphas for the four subscales became 0.66, 0.83, 0.71 and 0.62, respectively. Based on the rotated solution (Table 2) it can be seen that the expected factor structure for the

Figure 2
The verified model by CFA, on the second half of our sample; the un-standardized estimates, standard error of the estimates (in parentheses) and standardized estimates for each path and the variance of the error variables, are included
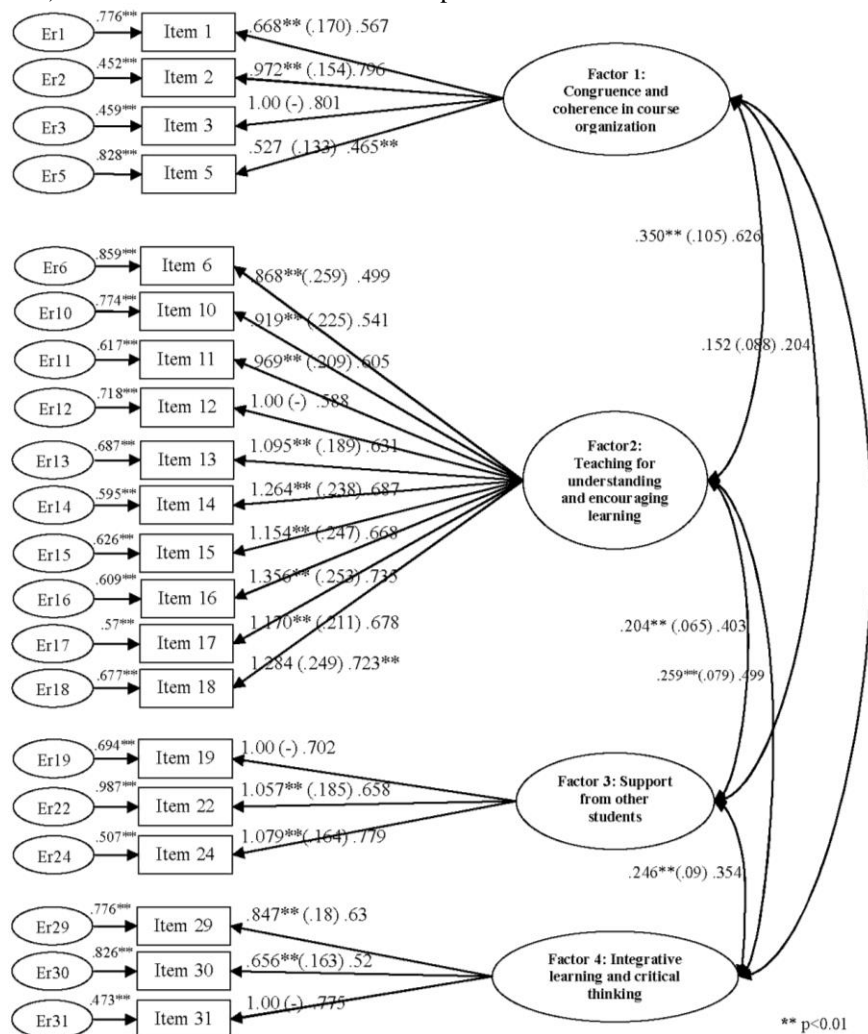
four subscales is verified by our data (the new KMO equals again 0.83). Before proceeding to CFA, it should also be mentioned that the correlations among the four factors (see the last part of Table 2) are all in moderate and positive levels (between factor 1 and factor 3 is found the greatest correlation).

Hence, the above procedure leads us to include 4 items in the first subscale (1-3 and 5), 10 items in the second subscale (6 and 10-18), 3 items in the third subscale (19, 22 and 24) and 3 items in the fourth subscale (29-31). Figure 2 illustrates the model we are going to verify (using CFA); potentially correlated factors are used.

The accuracy of our model is assessed by the following tests and descriptive fit indices (e.g. Raykov & Marcoulides, 2006): Chi-square=176.26 (p=0.24),

CFI=0.92, GFI=0.90 and RMSEA=0.02. Therefore, the null hypotheses that our model fit the sample equally well with the full model is not rejected (p=0.24>0.05); the value of RMSEA is less than 0.05 (also, 0.05 does not belong to the 90% confidence interval) while CFI and GFI are greater than 0.90. The regression coefficients of the model (using the GLS estimation method) are all positive and statistical significant (Figure 2). The greatest standardized effects are found from: factor 1 to items 2 and 3, factor 2 to items 16 and 18, factor 3 to items 19 and 24, and factor 4 to item 31. The only no-significant covariances among the four underlying factors are that between factor 1 and factor 3 and 4; the correlations are all positive while this between factor 1 and 2 is the most significant.

Table 2
*EFA of "Experiences of Teaching and Learning" (PAF extraction/Promax rotation)
and the Correlations Among the 4 Factors.*

Item	Pattern[a] Component				Structure[a] Component			
	1	2	3	4	1	2	3	4
1		.629					.544	
2		.600			.403		.664	
3		.513			.522		.643	
5		.588					.533	
6	.507				.617		.449	
10	.575				.503			
11	.645				.580			
12	.511				.551			
13	.547				.543			
14	.508				.567			.371
15	.559				.620			.384
16	.459				.534	.419		
17	.608				.564			
18	.709				.667			
19		.705				.708		
22		.479				.508		
24		.861				.836		
29			.677					.677
30			.440					.483
31			.621					.653
Correlations								
1	1	.252	.494	.275				
2	.252	1	.323	.056				
3	.494	.323	1	.136				
4	.275	.056	.136	1				

[a]. *Loadings below .35 not seen.*

Correlations

Before studying the correlations, it is necessary to confirm the underlying factor structure of the ASSIST in our whole sample (Karagiannopoulou & Milienos, 2013, also studied the psychometric properties of ASSIST on the current population). Previous studies indicated that the subscales "Alertness to Assessment demands" and "Monitoring effectiveness" fail to load appropriately on the strategic approach (Byrne et al., 2004; Diseth, 2001). Our results are in accordance with these findings (i.e., "Alertness to assessment demands" loads on the surface approach, and "Monitoring effectiveness" has low cross-loadings on the deep and strategic approach). Consequently, we excluded these two subscales from the analysis. Hence, the descriptive fit indices of our model are the following: Chi-square=134.83 (df=41, p<0.01), CFI=0.90, GFI=0.93, and RMSEA=0.08. Most of these indices lie in acceptable intervals, whereas RMSEA reveals a poor fit on our data.

Table 3 indicates the Pearson correlation coefficient among the subscales (composite scores) of the instruments used in the present study. Note that this table includes all of the correlations between the four subscales of ETL and the rest of the variables used in the present study. Hence, it can be seen (Table 3) that the great majority of the observed correlations are positive; the most significant positive correlations are found among the subscale, "Teaching for understanding and encouraging learning," and the majority of the deep and strategic subscales and the two variables depicting "knowledge" and "generic skills" acquired. Besides, of similar sizes are the correlations between "Integrative learning and critical thinking" and one deep (interest in ideas) and one strategic (achieving) subscale and the two estimated outcomes, "knowledge" and "generic skills" acquired. Besides, "Congruence and coherence in course organization" give a positive correlation with "Knowledge acquired"; "Support from other students" is only similarly highly correlated with "generic skills" acquired. On the other hand, the most significant negative correlations are among the four subscales of students' perceptions of the teaching-learning environment and the surface subscale "Lack of purpose."

Table 3
Pearson Correlations

	Seeking Meaning	Relating Ideas	Use of Evidence	Interest in ideas	Organized studying	Time management	Achieving	Lack of purpose
Congruence and coherence in course organization	.141**	.160**	.111*	.190**	.29**	.299**	.219**	-.256**
Teaching for understanding and encouraging learning	.239**	.378**	.351**	.311**	.306**	.313**	.328**	-.284**
Support from other students	.082	.121*	.129*	.085	.101	.077	.216**	-.001
Integrative learning and critical thinking	.254**	.271**	.250**	.303**	.262**	.260**	.289**	-.295**

	Unrelated memorising	Syllabus boundness	Fear of Failure	Self evaluation	Deep	Strategic	Surface	Knowledge acquired	Generic skills acquired
Congruence and coherence in course organization	-.187**	-.102	-.113*	.205**	.203**	.311**	-.248**	.327**	.241**
Teaching for understanding and encouraging learning	-.035	-.071	.064	.120*	.410**	.366**	-.128*	.475**	.338**
Support from other students	.002	.051	.002	-.014	.146**	.144**	.015	.185**	.399**
Integrative learning and critical thinking	-.132*	-.066	.059	.083	.340**	.317**	-.159**	.390**	.297**

*p<0.05, **p<0.01

Discussion

The study explores the factor structure of the "Experiences of Teaching and Learning" questionnaire in a specific course context. It sheds light on the validation of it using the ASSIST at subscale level, as a robust instrument that explores approaches to learning in full. The findings indicate a four-factor solution: "Congruence and coherence in course organization," "Teaching for understanding and encouraging learning," "Support from other students," and "Integrative learning and critical thinking." The factors are similar to previous studies that report six factors (Entwistle, 2009; Parpala et al., 2013); we have to point out that for the sake of face validity, the current study has not taken into account "Constructive feedback." Not surprisingly, "Teaching for understanding and

encouraging learning" comprises of items involving both "teaching for understanding" and "staff enthusiasm and support."

Moreover, the study gives indications of sufficient convergent and criterion validity of the "Experiences of Teaching and Learning." It suggests relations between its four factors and (a) ASSIST subscales and (b) acquired knowledge and generic skills, as well as self-evaluation (two parts of the ETLQ). The four-factor structure of the inventory, the strong and weak items, the patterns of relations with approaches to learning, relations to acquired knowledge and generic skills, and self-evaluation are closely similar to those obtained in other cultures (Hui & Triandis, 1985; Parpala et al., 2013; Xu, 2004). Also, the four factors give similarly high reliability coefficients with those reported in previous studies (McCune, 2003; Steis et al., 2012). The "Experiences of Teaching and Learning" can be

seen as a high context sensitive instrument for use across cultures; most of the items that did not contribute to the model "meet" integral aspects of teaching, assessment, and learning that involve demands about which students seemed to be unclear (Karagiannopoulou, 2010; Karagiannopoulou & Entwistle, 2013). Also, the condensed category, "Teaching for understanding and encouraging learning," that brings together items from "Teaching for understanding" and "Staff enthusiasm and support," is in line with previous findings (Karagiannopoulou, 2010; Karagiannopoulou & Entwistle, 2013, 2015).

The use of a subscale rather than a scale level to measure approaches to learning allowed us to shed light on aspects of convergent validity of the ETL in terms of the relations between its four factors and the set of variables included in the present study which disappear in the correlation set at scale level. The four factors of the ETL give quite strong significant associations only with a single surface subscale "lack of purpose," whereas there are only few weak correlations with the rest of the subscales of the surface approach. Such a finding possibly depicts the psychometric weakness of the surface scale. A range of studies report lower reliability of the surface scale (see Asikainen et al., 2014; Gijbels, 2005; Karagiannopoulou & Christodoulides, 2009; Karagiannopoulou & Milienos, 2015) and weak loadings of some of its subscales (Entwistle et al., 2001). Moreover, the few strong relations of "support from other students" with "achieving" (strategic subscale), and generic skills possibly depict an instrumental use of such a relation with peers rather than a real cooperation with peers (Lindblom-Ylänne, 2003). The use of subscales for the validation of the ETL sheds light on the relations between perceptions of the teaching-learning environment, learning motives, and processes. Not surprisingly, the less strong correlations involve links between the four factors of the "Experiences of Teaching and Learning" and the intention/motives for studying—namely seeking meaning, achieving, and fear of failure—for deep, strategic, and surface approach, respectively. Besides, the stronger correlations involve the relevant processes (the rest subscales comprising the deep and strategic scales but not the surface), which can be seen as reactions to teaching.

Items that Failed to Remain in the Model

The analysis supports the validity of the ETL as a context sensitive instrument. The items that failed to remain in the model refer to "obscure" aspects of the particular course. Some of the items do not load on any factor (items 4, 7-9, 20, 21, 23), and some give low loadings (items 25-28). In particular, the failure of items 20, 21, 23 and 25, that concern enjoyment and interest, to load on any factor may indicate that these items are of a quite different kind. They can be seen as

more to do with students as individuals rather than as reactions to the teaching they have experienced. Also, questions 27 (I could see how the set work fitted in with what we were supposed to learn) and 28 (You had really to understand the subject to get good marks in most of the courses) concerned assessment. The failure of these items to contribute to the model may well be interpreted as a consequence of students' unclear perceptions of exam demands and inconsistency between teaching and assessment (Karagiannopoulou, 2010; Karagiannopoulou & Entwistle, 2013; Karagiannopoulou & Milienos, 2013). In line with this interpretation about students' unclear perceptions of what they were supposed to learn, question 4 (What we were taught seemed to match what we were supposed to learn), question 8 (On most of the courses, I was prompted to think about how well I was learning and how I might improve), question 9 (Staff tried to share their enthusiasm about the subject with us) and question 26 (The handouts and other materials we were given helped me to understand the courses), focused on teaching and learning, do not load on any factor. Question 7 (I can imagine myself working in the subject area covered by the courses I have been taught) may be seen as irrelevant because this particular joint degree does not correspond well to the labor market. Students may have difficulty in seeing the relevance of the material and the contribution of teaching to their improvement as students. Besides, the variation of experiences among course modules may make it difficult for students to answer questions posed on a more general level (concerning the whole range of courses they have taken).

In our study the factor, "Teaching for understanding and encouraging learning," brings together items from "Teaching for understanding" and "Staff enthusiasm and support": two factors presented as separate in previous studies (Entwistle, 2009; Parpala et al., 2013). Items 25 and 27 (in the original version/ 16 and 17 in our version) seem to be strong items loading on "Staff enthusiasm and support" in Parpala et al. (2013), Herrmann et al. (2016), and Entwistle's (2009) studies. These items plus items 22 (in the original version/ 20 in our version) (Xu, 2004) and 28 (in the original version/ 18 in our version) (McCune, 2003; Xu, 2004) that originally loaded on "stuff enthusiasm and support" (see also Parpala et al. 2013) load on "teaching for understanding and integrating learning" in our study. Herrmann et al. (2016) supported this finding. They reported that the item "the staff helped us to see how we are supposed to think and reach conclusions in this subject" loaded on "staff enthusiasm and support" while on "teaching for understanding" in Parpala's study. Recent studies indicate that good teaching relates to the teacher's enthusiasm. A "meeting of minds"—as a relational experience where students' experiences with enthusiastic

tutors who teach for understanding, value their views, and show concern about their development—has been found to come along with deep learning and personal understanding (Karagiannopoulou & Entwistle, 2013, 2015; Rowe, Fitness, & Wood, 2013). Although the questions excluded after the analysis were many, the number of items (20 items) included in our version is similar to that suggested by previous studies (21 items with Herrmann et al., 2016; Parpala et al., 2013) and also to the 25-item version used by Steis et al. (2012). Also, most of the 20 items that remained in the version presented in the present study are strong items that appear in a most recent version of the "Experiences of Teaching and Learning" (15 items, Entwistle, 2009). Items 22, 25, 27, 28 (in our version) appear in most versions (Herrmann et al., 2016; Parpala et al., 2013). Drawing on both our study and Parpala et al. (2013) study, we suggest that questions 9 (I could see the relevance of what we were taught in this course unit) and 28 (You had really to understand the subject to get good marks in this course unit; see items 11 and 34 in the original version/ 9, 28 in our version) are weak items. In consistency with Parpala et al. (2013) and Entwistle (2009), these items failed to remain in our version.

Associations with Approaches to Learning, Knowledge and Skills Acquired, and Self-Evaluation

In our attempt to support the validation of the "Experiences of Teaching and Learning," approaches to learning were not explored by the relevant inventory (ALSI) included in the ETLQ but by its full version, ASSIST. The subscales comprising each approach allowed us to get a more complete picture of the associations between the academic context and the particular elements of deep, strategic, and surface approaches in a sample of students who were not familiar with course evaluation. The convergent validity of the ETL was supported by consistent statistically significant positive and negative correlations between most of its factors and (a) the subscales included in the deep and strategic scales and (b) the only one surface subscale (lack of purpose), respectively (Entwistle et al., 2003; Parpala et al., 2013; Xu, 2004). The study reveals expected positive associations with deep and strategic subscales. However, the strong pattern of associations between only one surface subscale, namely, lack of purpose, and the four factors included in the "Experiences of Teaching and Learning" possibly reveal the problematic structure of the scale (Asikainen et al., 2014) and the difficulties in the interpretation of the surface scale. The relevant literature suggests that the items describing the surface scale are of two kinds, "memorizing" and "lack of purpose." Lack of purpose depicts an implicit negative motive (personal communication with Noel Entwistle, 1st of August 2017). Thus, the perceptions of the teaching environment may impact students' implicit motive, namely,

lack of purpose, but fail to have an effect on the processes, such as unrelated memorizing employed by students, on their attitudes, such as syllabus-boundness, and on motivation, such as fear of failure. Such suggestions are in line with the stable dimension of approaches (see Karagiannopoulou & Milienos, 2013).

The study supports previous findings that associations between "support from other students" and approaches to learning comprise a less statistically significant set of correlations (see Entwistle et al., 2003; Parpala et al., 2013). However, we found a strong correlation between "support from other students" and students' motivation to achieve (strategic subscale) and also very low correlations between "support from other students" and all of the deep and strategic subscales. Such associations possibly indicate that students are more likely to depend on other students than "to be truly promoted by a real" cooperation with peers (Lindblom-Ylänne, 2003). The findings support the validity of the instrument to the extent that they are supported by studies in the SAL tradition. Moreover, the correlations identified do not indicate causal relations but only associations. The "Teaching for understanding and encouraging learning" is the environmental subscale that gives the strongest sets of correlations, with most of the deep and strategic subscales and the strongest negative correlation with "lack of purpose" (surface subscale). The next strongest factor is "Integrative learning and critical thinking" (Entwistle et al. 2003; Karagiannopoulou & Milienos, 2013; Parpala et al. 2013).

Further support to the validation of the "Experiences of Teaching and Learning" is brought by the associations between its four factors and the other sections included in the ETLQ that involve estimated learning outcomes and student's self-evaluation. The study indicates a quite strong pattern of associations between almost all of the four perceptions of the teaching-learning environment and "Knowledge" and "Generic skills" acquired. This is inconsistent with previous studies (Entwistle et al., 2003; Xu, 2004), which suggest such strong correlations only for "Teaching understanding and encouraging learning." Besides, support to the "Experiences of Teaching and Learning" as a context sensitive instrument comes from higher correlation between self-evaluation and "congruence and coherence" (most of the items in this factor involved even implicitly the learning required for exam success). Both of the above sets of associations are well supported by a previous study indicating the contribution of "congruence and coherence" and "teaching for understanding" to achievement through the deep and surface approaches (Karagiannopoulou & Milienos, 2015).

Limitations and Future Research

Although the present study is not a large-scale study and our sample comes from a particular department, the study supports the appropriateness of the use of the

"Experiences of Teaching and Learning" in the current Greek sample as a context-sensitive instrument. The range of correlations between aspects of the academic environment and elements of approaches depicted in the relevant subscales seem to keep alive the discussion about the subscales comprising each approach as conceptual entities that provide a more detailed picture of students' learning. Future research towards the development of a version of "Experiences of Teaching and Learning" with general value would be useful to focus on associations with elements (depicted in subscales) of the approaches in which perceptions of the teaching-learning environment have an impact, improving also the validity of the surface scale. This proposal draws on Trigwell and Prosser's suggestion that experiences of the teaching-learning environment and approaches are aspects of the same underlying phenomenon and so are simultaneously present in students' awareness (Trigwell & Prosser, 1991a, 1991b). A focus on failure of perceptions of the teaching-learning environment to relate to particular elements of the surface approach sheds light on the ongoing discussion about students having developed a particular approach by the time they enter the university (Asikainen et al., 2014; Asikainen & Gijbels, 2017), which hardly changes in the course of their study. It is suggested that the "Experiences of Teaching and Learning" (the second section of the ETLQ) offers a valuable instrument that measures students' perceptions of the teaching-learning environment, although its psychometric properties have to be tested in different contexts; some items are likely to fail to contribute to particular versions in different contexts. However, most of the studies so far have led to shortened versions but not to "amended" items supporting the face and content validity of them. Future research may be directed towards the use of item-relation analysis, instead of correlation designs, for the development of a short version of ETL with general value.

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Higher Education Supervision Practices on Student Thesis Writing: Language Function and Focus of Written Feedback

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Supervisors' feedback can be taken as the most powerful pedagogical tool in thesis writing. However, relatively little is known about the type of information supervisors focus on and the language functions supervisors use to communicate with their students. Data collected from eight supervisors' written feedback to students' theses at Bahir Dar University, Ethiopia were coded, tabled, and converted into percentages for analysis. The results of this study showed a wide range of supervisors' practices concerning the functions and types of written feedback. While the supervisors favored feedback on the genre knowledge the most and directive clarification language functions was most frequently used to communicate with the students, little or no attention was given for the expressive approval of language functions. Overall, the results of this study suggest that supervisors' written feedback can be taken together in regard to the process of effective communication. Finally, implications for better supervision practices and further research are presented that could shed light on the strengths of using other research tools.

Writing a thesis and/or a dissertation is a daunting experience for all novice researchers. Particularly, this is more complex when English as a foreign language is used as a means of communication for research purposes partly because EFL (English as a Foreign Language) students' capabilities in the accuracy and fluency of the language are limited, as a result of which they lack the linguistic competence to adequately address each aspect of the research. Despite the fact that research courses that serve as a vehicle to build students' research skills are offered in both undergraduate and graduate schools, the student researchers have little or no capacity and understanding of basic research components and skills necessary to undertake a study.

In most universities, students usually do research under the supervision of professors. Apart from nurturing a strong working relationship with the student, the overall passion and professional commitment of advisors to educational research should not be understated. Heath (2002) stated that the role of the supervisor is to guide the research student throughout his or her study, to provide the student the time, expertise, and support to foster the candidate's research skills and attitude in order to ensure the production of a research of acceptable standard.

As student researchers are expected to take no course other than their research course in the final academic year of their study, the usual face to face interactions between the students and their professors can be minimized. Upon the acquaintance of their advisees, supervisors may start their supervision by discussing the area under investigation and the overall expectations of the research. In such kind of collaborative work, therefore, it is important not to underestimate the relentless efforts of supervisors in stimulating and enriching student researchers with relevant knowledge and expertise pertaining to

research. The most decisive factor for better or worse of research is the advisor-advisee relationship (Sambrook, Stewart, & Roberts, 2008; Tahir, Ghani, Atek, & Manaf, 2012), and this relationship can be better fostered through effective communication between the supervisor and advisee.

Supervisor Written Feedback and Why It Matters

There is a general agreement in the literature around the conceptualization of feedback as a process of communication and dialogue in specific social contexts (Pokorny & Pickford, 2010). Accordingly, one of the approaches used to support student researchers, and hence improve supervision practices within higher education institutions, is through supervisors' written corrective feedback. Engebretson et al. (2008) stated that the quality and appropriateness of research supervision is critical, and that supervisors' constructive and detailed feedback on written work has been identified as a key characteristic of good research supervision.

Feedback is embedded in supervisory relationships as it can propagate a power relationship in which one is the master and the other the learner (Kumar & Stracke, 2007), and, "In a supervisory environment, feedback on written drafts is a form of communication, as it is through written feedback that the supervisor communicates and provides advanced academic training, particularly in writing, to the supervisee"(p. 462).Apart from bonding a close rapport with their students, supervisors' written feedback can also help foster students' linguistic capability. Overall, to achieve quality teaching and supervising, effective and quality feedback should be provided (Rowe & Wood, 2008).

The student-supervisor relationship is an important determinant of quality of supervision (Ali, Watson, & Dhingra, 2016), and an effective working relationship

between the supervisor and the student is crucial (Murphy, Bain, & Conard, 2007; Tahir et al., 2012). The impetus for the present study stems from the notion that the types of language functions used to provide feedback determine the quality of student-supervisor communication, thereby increasing or impinging on their relationship. This relationship requires a long-term commitment from both sides so as to transform a student's research skill. One of the commitments that offer excellent potential for increasing the supervisor-student relationship can be the type of language function supervisors use to communicate with their students.

Supervisors need to envisage students' psychometric understanding and determine how their students will react to written feedback. This is because, as Layder (1997) posits, the student's ability or willingness to do the feedback might depend on the emotional impact of feedback. Their motives to do so or not may result from positive responses such as deep consideration of the feedback and reasoned rejection of it, or negative responses such as distrust of the feedback provider (Price, Handley, Millar& O'Donovan, 2010).

Based on the type of language function provided to theses, students may show different emotional feelings towards supervision practices. For example, if supervision is full of an overly negative tone of feedback, students may lose control of their emotions or may get fraught with difficulty (Price et al, 2010). On the contrary, if supervisors consider the psychometric expectations of their students, feedback helps students overcome their emotions, and such feedback impacts greatly on future improvements. Feedback is deemed to be ineffective if students do not act on it (Gibbs & Simpson, 2004). Therefore, understanding the psychometric expectations of students and the complexity of the feedback processes is particularly important for effective supervision.

Research Evidence on Supervisor Written Feedback

A large body of research (Pearson & Brew, 2002; Kamler& Thomson, 2008; Whisker, 2005, as cited in Bitchener, Basturkmen, East, & Meyer, 2011) indicates that the topic of research supervision has attracted considerable interest in the literature to date. Recent research has indicated that effective and high quality feedback is a key element of quality teaching in higher education (Hattie & Timperly, 2007; Sutton, 2009; &Weaver, 2006). On the other hand, Armstrong (2004) reported the high figures of failures of postgraduate degrees in the social sciences in the UK and North America. Further, this study indicated that a high proportion of those who complete their research degrees take longer time than expected, and students often express dissatisfaction with the research process.

These studies reveal numerous concerns for both postgraduate students and supervisors.

According to Lindemann (2001), effective feedback is feedback that is focused, clear, applicable, and encouraging. Moreover, providing feedback to students gives students the opportunity to reflect on their work and to modify it in order to become more effective (Pearson& Kayrooz, 2004).If feedback is carefully targeted, especially with less efficient learners, it can enable students to acquire and utilize appropriate strategies to process the objectives of learning(Hattie & Timperley, 2007). This is because as learners' level of proficiency increases, they become more capable of correcting their own mistakes (Amrhein & Nassaji, 2010; Ferris, 2006; Ghandi & Maghsoudi, 2014; Jodaie & Farrokhi, 2012; Lee, 2003).

Effective feedback is a clear set of guidance that is helpful in enhancing students' writing. Students were most satisfied with their supervisors when they receive both regular and constructive meaningful feedback on research and progress towards the degree (Zhao, Golde, & McCormick, 2007). Hyland (2009) posits that the most helpful feedback is that which helps them understand the expectations of their disciplinary community and "conveys implicit messages" about the values and beliefs of the discourse community, the nature of disciplinary knowledge, and student identities in the community (p. 132).

Regarding the language function of various types of written feedback, research has indicated that the way in which comments are worded by supervisors can have a potential of affecting students both negatively and positively. According to Weaver (2006), self-esteem is affected by receiving negative or unexpected feedback, especially for students with low self-confidence who tend to take all feedback as a judgment of ability. This makes the student feel beaten, and he or she may think of leaving the study. Despite the fact that feedback constitutes a major form of instruction for higher degree research students, the general focus of advisors has been reported written feedback on the micro-level (Bitchener, Basturkmen & East, 2010) and the struggle to articulate implicit knowledge (Paré, 2011).

Theoretical Framework

Realizing the theoretical framework's underlying concepts is important for educators as it will help them manage the feasibility of concepts and translate the essence of the theory into effective instructional outcomes accordingly. This study is grounded in Searle's (1969) prominent theory of speech acts and Vygotsky's (1978) socio-cultural theory of learning. The first theoretical framework that is related to the present study is the fundamental concept of the Speech Act Theory by Searle (1969). Searle (1969) classified

speech into three major categories: locutionary, illocutionary, and perlocutionary.

It is important to note that the "act" in speech act theory includes not only the speech that someone makes but also the writing of a particular string of words one uses in communication. While locutionary involves the actual words of the message, the hearer's reaction to the speaker's message is termed perlocution. The concept of an illocutionary act, which states the speaker's purpose or intent, is the cornerstone of the speech act theory. This study focuses on illocutionary acts because they are commonly used to reject proposals and to make requests indicating that they have direct relevance to the area under investigation. The central premise of speech act theory is that the role of every utterance to a particular speech-act type is part of what is communicated and plays a necessary role in comprehension (Sperber & Wilson, 1995).

Out of a total of five illocutionary acts (assertives, directives, commissives, declarations and expressives) proposed by Searle (1969), assertive, commissives and declaratives have been excluded from the analysis because in the face of reality, these three speech acts rarely exist in supervisor-student written communication. Therefore, for this study, directives (instruct somebody to do something) and expressives (express feelings and attitudes) were used to classify and analyze supervisors' written feedback to student theses. One of the most common speech acts that are usually evident in the communications between student and supervisor is requesting clarification on the student's arguments. Supervisors often request for clarification and express their attitudes and emotions towards the proposition.

The role of feedback in teaching and learning is documented in educational literature. (Price et al, 2010), and the role of feedback in facilitating student learning has been perceived on many theoretical and pedagogical grounds. Morris and Adamson (2010) stated that constructivist theorists conceived language learning as the active building of knowledge by the learner, indicating that the learner needs to actively engage in the learning process with information and feedback from teacher, peer, book, parent, self, and experience (Hattie & Timperley, 2007).

In his classical concept of socio-cultural theory of learning, Vygotysky (1978) explains the preeminent effect of social interaction to facilitate learning. He conceived the interface between learning and development through interaction, scaffolding, and modeling. Vygotysky rejected the notion of development as a necessary precondition for instruction and learning, and he stressed the importance of social interaction when he argued that the dialectic unity of learning and development inherently proceeds through specific stages whether instruction is made available or not.

Vygotysky (1978) proposed that while the individual actively learns, he/she needs to be assisted by the other, which he termed the setting as the "zone of proximal development."The term "zone of proximal development" is one of the most widely known concepts that have been used as a reference in language learning research. (ZPD) is the area of exploration for which the student is cognitively prepared but requires help and social interaction to fully develop. He stated that "the zone of proximal development permits us to delineate the child's immediate future and his dynamic developmental state, allowing not only for what has already been achieved developmentally, but also for what is in the course of maturing in the jointly-accomplished task" (p. 79).

Vygotysky explains that a social interaction between a more able person and a less competent person plays a fundamental role in the development of cognition. He further elaborates that a teacher or more experienced peer is able to provide the learner with "scaffolding" to support the student's evolving understanding or development of complex skills. Collaborative learning, discourse modeling, and scaffolding are strategies for supporting the intellectual knowledge and skills of learners and facilitating intentional learning.

According to Vygotysky (1978), the most important feature of the ZPD is that, as with novices and experts in any field, learners are not yet fully alienated. He illustrated how the process unfolds in that meaning for children is fully tied to the contexts in which words are used. He further provided experimental evidence for how words have different meanings for children and how children appropriate adult meanings as a consequence of collaborative activity with others in the ZPD.

Rationale for the Study

In light of the empirical data about students' poor writing proficiency and the preeminent value of research, this study was presumably considered the best alternative with the potential to inform educators and supervisors to improve thesis writing. Hence, the results of this study could help to conceptualize, plan, and implement integrated supervision, or it is vital to consider the possible consequences of not implementing integrated supervision on the writing achievement of students.

Research indicates potential problems with how feedback is communicated in higher education (Bitchener et al, 2011). These include feedback that may lack specific advice on how to improve (Higgins, Hartely, & Skelton, 2001) or feedback that may not be communicated clearly enough for students to be able to interpret (Carless, 2006; Chanock, 2000). Taken

together, the results indicate that an awareness of the "psychology of giving and receiving feedback is vitally important to student learning" (Carless, 2006).

Therefore, this study rests on the belief that understanding a great deal about the current trends of written feedback provided by supervisors can help for designing effective and appropriate mechanisms to strengthen the communication between the student researchers and supervisors. The present study examined supervisors' written feedback on MA thesis writing based on the two primary roles of speech acts that are usually manifested in supervisor-student communication through writing—directives and expressives—and analyzed the type of specific written feedback (content generic or linguistic) employed by supervisors at Bahir Dar University.

Statement of the Problem

Reports from university instructors, experts, and the larger educational community suggest that too many university-level students have limited ability in writing academic texts. Further, the Ethiopian students often complain of being dismissed from the university because of their incompetence in English. The students can express their subject-matter knowledge in L1 but not in English (Jha, 2014). Students' thesis writing cannot improve if students are not communicating with their supervisors effectively. Consequentially, one of the most relevant measures to ensure high quality education pertaining to research can be to substantially increase the communications between supervisors and student researchers through written feedback.

The main objective of higher education in Ethiopia is to promote and enhance research focusing on knowledge and technology transfer consistent with the country's priority needs. The conflicting pressures from research reports and documented problems on the one hand and increasing demands for quality research to substantially prepare knowledgeable and skilled manpower on the other hand underscore the dire need to support students with their writing (Lavelle & Bushrow, 2007).In light of these concepts and the empirical evidence reviewed, therefore, the present study was designed to respond to this need.

Significance of the Study

This study emanates from the belief that understanding a great deal about what constitutes effective feedback based on speech acts analysis of communications between supervisors and students is helpful to boost the communicative functions of written feedback. It may also be helpful for supervisors to revisit their supervisory practices and generate new designs that require adaptation to a different means of

written feedback. It may also be used to provide insight into understanding the type and frequency of specific language functions used by the supervisors when they provide written feedback on student theses.

Feedback can be taken as the most powerful pedagogical tool provided that it is effective communication. There is currently limited research on the communication between supervisors and student researchers through written feedback as most of the previous research on written feedback has focused on teachers' written feedback to respond to their students' writing in the classroom rather than to student thesis writing (Diab, 2005; Katayama, 2007; Riazi & Riasti, 2007; Wang, 2010).

Despite the fact that there is a general agreement on the importance for supervisors' written feedback to the development of student writing, what aspects of written feedback (content, generic or linguistic) are being provided by university professors for their students' thesis writing remained in question, especially in the Ethiopian higher education context. To achieve the desired goal of this study, the following research questions were formulated:

1. What type of language functions are most frequently used in supervisors' written feedback on students' theses?
2. What types of the supervisors' written feedback on student thesis were most frequent?
3. Is there a difference in the type of feedback provided by supervisors from TEFL and Media and Communication?

Method

Participants

Participants were drawn from the two discipline areas, namely TEFL and Media and Communications. Twenty supervisors who were assigned to advise 15 TEFL and 5 Media and Communications MA summer students at Bahir Dar University were asked to submit their feedback to these students available in an electronic track feedback system. Of the 20 participants sought for the study, 5 supervisors from TEFL and 3 supervisors from Media and Communications either gave electronic feedback or volunteered to take part in the study. All the theses belonged to students who were currently third year graduate students. The final drafts of the students' theses were purposefully selected on the assumption that adequate feedback could be collected from their thesis as they were supposed to complete their studies by the end of the academic year.

The Study Setting

This study was conducted on supervisor-written feedback in response to the Master of TEFL and Media

and Communications students' thesis writing at Bahir Dar University, Ethiopia. The thesis work was in a compulsory course offered to graduate students as a partial fulfillment of the requirement for the MA degree in TEFL and Media and Communications. The students' thesis writing, which lasts for a year, is supported by advisors who are assigned to supervise the overall research project or writing of a thesis proposed by the student researchers. Supervision, which includes responding to the first draft, and revision are carried out through the year until the final submission of the paper to their respective department.

Data Collection

Data was collected from supervisors' written feedback on their students' theses to provide detailed information on the communicative functions of various types of feedback provided by the supervisors. Specifically, it was collected from the in-text and the overall feedback on the complete draft of an MA thesis in TEFL and Media and Communications. Evidence of feedback from samples of students' theses was analyzed using language function analysis, and feedback types were categorized and quantified.

Development of a Model for Feedback Analysis

The data obtained from supervisors' written feedback was collected, coded, and analyzed pertaining to the two primary speech act categories selected for this study: Directives (ordering the hearer to do something) and Expressives (expressing the speaker's attitudes and feelings). The two categories were further classified into four sub-categories. While directives were classified as instruction and clarification, expressives were further divided into approval and disapproval (Leng, 2014). These functions of speech were utilized as they are the basic components of supervisor-advisee communication and have received considerable agreement among researchers who examined the role of speech acts in supervision and written texts (Kohandani, Farzaneh, & Kazemi, 2014;Kumar & Stracke, 2007;Leng, 2013) . This study was guided by open, axial, and selective coding strategies (Strauss & Corbin, 1998).

The focus of supervisors' written feedback was examined in relation to three major areas: content knowledge (its accuracy, completeness, and relevance), genre knowledge (the functions of different parts of a thesis), and linguistic accuracy and appropriateness (Bitchener et al., 2010). The data obtained from the samples of written feedback was then organized in tables. The samples collected from the supervisors' written feedback were number coded, and the written feedback frequency was converted into percentages for analysis.

Results

The existing results obtained from the samples of supervisors' written feedback could be condensed into three stranded themes. The first section presents the frequency and percentages of the two primary speech functions (directive and expressive functions and their sub-categories) observed in the supervisors' written feedback to their student thesis writing. The second stranded presents the thematic analysis of the samples pertaining to three types of feedback. The third section presents the comparison trends of instructors' written feedback in the two disciplines, TEFL and Media and Communication.

Results for Supervisors' Written Feedback Function on students' theses

The raw scores and percentage of the categories and sub categories of the two primary language functions were calculated, and the results are presented as follows. As a whole, directive function strongly endorsed by the supervisors' feedback seemed to be the favored language function (72.28%). Regarding the sub-categories of directives, the results of the samples seemed to indicate that the supervisors valued directive clarification function the most (44.56 %,) followed by directive instruction (27.72%). The third and the fourth speech functions communicated by the supervisors through their written feedback were expressive disapproval (25.26%) and expressive approval (2.46%).

It is notable that unlike directive comments, the expressive function of the written feedback collected from the students' theses was low. In a nutshell, it was evident that the supervisors' use of the directive function was predominant: especially, directive clarification received almost half of the total supervisors' written feedback collected for this study. On the contrary, the supervisors showed little amount of expressive functions. Particularly, guidance through expressive approval was rare (2.46%) in their communications with their students through written feedback.

Results for Supervisors' Written Feedback Focus on Student Thesis Writing

As Table 3 depicts, written feedback on genre knowledge (58.95 %) was emphasized by supervisors from the two departments more frequently than feedback on content knowledge (28.07 %) and linguistic accuracy and appropriateness (12.98 %).On the whole, supervisors from both disciplines favored feedback on genre knowledge than feedback on content knowledge and linguistic accuracy and appropriateness. The samples' evidence of the supervisors' written feedback to students also showed that supervisors from TEFL and Media and Communications shared almost

Table 1
Supervisors' Feedback Categories based on the two Speeches Act Functions

Main Function	Subcategory	Examples
Directive	Instruction	Elaborate your point in detail here.
	Clarification	What does this mean? It is not clear
Expressive	Approval	I like the organization of the literature.
	Disapproval	I don't see any connection with your title!

Table 2
Descriptive Statistics for Supervisors' Feedback Function on Students' Theses

	TEFL		Media and Communications		Total	
Function	Number	Percent	Number	Percent	Number	Percent
Directive-instruction	51	27.72	28	27.72	79	27.72
Directive-clarification	82	44.57	45	44.55	127	44.56
Expressive-approval	2	1.09	5	4.95	7	2.46
Expressive-disapproval	49	26.63	23	22.77	72	25.26
Total	184	100	101	100	285	100

Table 3
Descriptive Statistics for Supervisors' Focus on Student Thesis

	TEFL		Media and Communications		Total	
Feedback Type	Number	Percent	Number	Percent	Number	Percent
Content knowledge	51	27.72	29	28.71	80	28.07
Genre knowledge	111	60.33	57	56.44	168	58.95
Linguistic accuracy and appropriateness	22	11.96	15	14.85	37	12.98
Total	184	100	101	100	285	100

similar concerns regarding feedback on content, 27.72% and 28.71% respectively.

Discussion

Supervisors' Written Feedback Function on Student Thesis Writing

Based on the data obtained from the supervisors' written comments, it was evident that almost all of the supervisors communicated with their students largely through the directive clarification function. Clarification feedback is feedback that seeks students to make their points clearer. This type of feedback can serve as a general guideline for students since it shows them both what and how to revise their thesis. The particular feature of this feedback is that questions that ask students for further clarification are posed and general information about the ambiguous points is also highlighted so as to give the writer a sort of direction.

The directive written feedback observed in the students' theses included comments in either statement or question form. The following are some of the directive instructions that asked the students to revise the language and to identify the correct components of the thesis:

- "State clearly about development [of] communication."
- "Please paraphrase, mind your language, and include this in the participants' section."

The directive clarification comments collected from the supervisors' written feedback asked students to clarify the theoretical framework used and the design of the study employed in their respective theses. They include the following:

- "What is (are) the theoretical framework (s)?"
- "How do you measure suitability? More precisely, was it a purposive sampling"

These samples of written feedback collected from student theses showed that the supervisors' strong commitment to providing directive clarification and the supervisors' constructive and detailed feedback on written work have been identified as key characteristics

of good research supervision (Engebretson et al., 2008). The supervisors seemed to recognize that the use of more directive clarification functions of feedback could help them provide detailed and important information as the work could be directly referenced to this function of written feedback.

The result of this study, therefore, supports the findings of previous research that reveal that feedback offers a sense of direction and guidance to students in order to improve on subsequent pieces of work (Gibbs & Simpson, 2004; Glover &Brown, 2006; Hyland & Hyland, 2006; Nicol, 2010). The frequent use of directive feedback reported in this study may have implications for students in establishing effective communication patterns and thereby improving their thesis writing. In other words, the written communications observed in this way are helpful for students' thesis writing as directive-clarification feedback provided specific directions to students on how to revise their essays (Kumar & Stracke, 2007). In the same vein, Hyland and Hyland (2006) claimed that in order for improvement to take place, feedback should be loaded with information.

As for specific speech act functions, one of the directive speech functions that was observed frequently in the students' theses was directive instruction feedback (27.72 %). See Table 2. The types of instructions prevalent in the comments include the following:

- "Don't forget to edit your work."
- "Bring it before sampling."
- "Include this in the participants' section."
- "Reorganize this into a coherent body of text."

The value of directive instruction feedback on different aspects of students' theses writing by supervisors in this study was relatively higher than other sub-categories of expressive functions. The present report on directive clarification, therefore, can be interpreted in that the function of directive instruction was also popular among the supervisors.

In comparison to direct clarification, the supervisors exhibited less attention on directive instruction. Given the fact that the participants were university level graduate students, the result of this study in this regard is not surprising as the supervisors might have considered their students as matured enough to understand the direct instructions that order students to revise accordingly without more clarification. This observation is reminiscent of the results of a large body of research that revealed that as learners' levels of proficiency increase, they become more capable of correcting their own mistakes (Amrhein & Nassaji, 2010; Ferris, 2006;Ghandi & Maghsoudi, 2014; Jodaie & Farrokhi, 2012; Lee, 2003).

From the outset, it was hypothesized that the supervisors should employ little of this type of feedback as such comments give little comfort for their students and hence can be demoralizing and lead to negative emotions (Caffarella & Barnett, 2000; Weaver, 2006). Regarding the frequency of the sub-categories of expressives, the result of this study indicated that the supervisors exhibited higher expressive disapproval comments than expected (28.14%).

The expressive comments collected from the supervisors' written feedback that supervisors strongly disapproved of their students' written text include: "I don't see any connection with your title with this! It has major limitations almost in all the parts. This is not a conventional way of citing from an internet source."

The supervisors' attitude towards criticism and negative feedback obtained from the supervisors' written feedback, therefore, can be taken as the essence of better learning and may have positive implications for the students. This result substantiated the notion that students appreciate and benefit from constructive criticism as it increased their self confidence in their writing (Button, 2002; Goldstein, 2004).However, the result of this study may have implications for supervisors to revisit their feedback mechanisms as negative feedback is potentially more powerful than positive feedback (Brunit, Huguet & Monteil, 2000). Further, if supervision is full of an overly negative tone of feedback, students may lose control of their emotions or may get overwhelmed with difficulties (Price et al, 2010). Feedback is deemed to be ineffective if students do not act on it (Gibbs & Simpson, 2004).

Therefore, it is important to note that supervisors need to help students to manage negative emotions caused by critical feedback by including positive and encouraging feedback along with critical comments because effective feedback is feedback that is focused, clear, applicable, and encouraging (Lindemann, 2001). Also, praise has the ability to improve student academic or behavioral performance, but only if the student finds it reinforcing (Akin-Little, Eckert, Lovett, & Little, 2004).

The expressive approval speech function motivates students to express their moral values and get them approved by their advisors. Conversely, it was found that the supervisors gave little or no value to this function of written feedback (2.46%). The comments that showed the supervisors' approval include: "I like the organization of the literature. Generally, there are improvements in your introduction part in this draft. It is a good discussion."

Although some researchers advocate that negative feedback may help students to fully realize better learning from criticism (Button, 2002; Goldstein, 2004), students recommended that feedback should be positive, consistent, timely, and clear with a balance between positive and constructive comments and

comments that critiqued their work (Bitchener et al., 2011).If feedback is carefully targeted, especially with less efficient learners, it can enable students to acquire and utilize appropriate strategies to process the objectives of learning(Hattie & Timperley, 2007).

In another research, it was revealed that students wanted supervisors to demonstrate genuine interest in their work, while at the same time recognizing that ultimately the work was the students' responsibility (Bitchener et al, 2011). Given the students' reported the need for, and the value of, positive supervisor written feedback (expressive approval), it is possible to claim that the supervisors would be more fruitful if they reasonably considered this type of feedback in their written supervision to improve student thesis writing.

A plethora of research also revealed that feedback that includes praise may be effective because it elicits a positive affective reaction, which often has been linked to increased motivation and higher goals and to improved student academic or behavioral performance (Akin-Little et al., 2004; Gee, 2006). It is vital to recognize that the inclusion of both negative and positive feedback on a student thesis needs to be framed together to establish effective communication. Supervisors need to establish close rapport with their students by designing constructive feedback that includes praise as well as criticism of their students' thesis writing. Taken together, supervisors need to consider the psychometric expectations of their students so that feedback helps students overcome their emotions, and such feedback impacts greatly on future improvements. Also, an awareness of the "psychology of giving and receiving feedback is vitally important to student learning" (Carless, 2006).

Interestingly, the written feedback collected from the samples showed that the supervisors had showed their mixed reactions (both approvingly and disapprovingly) to students' thesis writing. As a result, a new function of language that cannot be categorized under either expressive approvals or expressive disapprovals emerged from the collected comments. The researcher preferred to use this language function as an "ambivalent" category. In this category, approval feedback is given as a form of reward for the students' progress, and simultaneously disapproval feedback is provided to show a total disagreement. Given the fact that the written feedback the supervisors employed includes conflicting comments to thesis writing improvement, the result of this study may have implications for supervisors to revisit this kind of feedback mechanism since poorly presented or uninformative feedback, rather than inadequacy of knowledge on the part of students, was responsible for its low efficacy as a learning tool (Howie, Sy, Ford & Vicente, 2000).

Supervisors' Written Feedback Focus on Student Thesis Writing

The supervisors' written feedback on their students' theses writing will be discussed in relation to the three major areas: content knowledge (its accuracy, completeness and relevance), genre knowledge (the functions of different parts of a thesis), and linguistic accuracy and appropriateness (Bitchener et al., 2010). Therefore, the next step in presenting the results will be to explore what aspects of the students' theses that the supervisors emphasized.

The most frequently commented-on written feedback was on the genre knowledge. The written comments forwarded by the supervisors include concerns dealing with referencing and citations, the functions of different parts of a thesis, and the relevance and appropriateness of the thesis for scientific research. The following were some of the examples:

- "You start with general idea and then move to specific idea or contexts."
- "The citation and other formats should be consistent throughout your paper."

Overall, the supervisors' major focus has been on providing feedback on the functions of different parts of a thesis to improve student thesis writing. This observation contrasts with the recent research reveals that supervisors' focus of feedback in thesis writing has mainly been on content knowledge (Kumar & Stracke, 2007).Despite the fact that feedback constitutes a major form of instruction for higher degree research students, the general focus of advisors has been reported written feedback on a micro-level (Bitchener et al.,2010) and the struggle to articulate implicit knowledge (Paré, 2011). It was also interesting to observe that all of the supervisors shared their research experiences with students through their written comments as as the role of supervisor is to guide the research student throughout their study, provide the time, expertise and support to foster the candidate's research skills and attitude and to ensure the production of a research of acceptable standard (Heath, 2002).

The second most frequently observed written feedback in terms of what aspect of the students' theses was emphasized were comments that asked students to foster their content knowledge and display in their research. In terms of content knowledge—its accuracy, completeness and relevance—the following comments that ask students to show their overall conceptual understanding were emphasized by the supervisors:

- "You did not raise anything about attitude."
- "State clearly and specifically about the nature of task based language learning/teaching."
- "You didn't explain Melkote's idea."

Hyland (2009) posits that the most helpful feedback is that which helps students understand the expectations of their disciplinary community. It "conveys implicit messages" about the values and beliefs of the discourse community, the nature of disciplinary knowledge, and student identities in the community (p. 132). Although the extent to which evidence of feedback from samples of students' theses is not as high as expected, the supervisors' preferences of providing feedback on content exhibited in this study is partially consistent with a plethora of research that confirmed that commentary on content was the category seen across the highest number of scripts (Bitchener et al, 2011; Hyatt, 2005; Kumar & Stracke, 2007).

Compared to the other two major areas of research writing, the supervisors showed little attention to the quality of their students in terms of the linguistic accuracy and appropriateness of the students' thesis writing. This was clearly exhibited by the students receiving only 12.91% of comments on these issues out the total comments provided by the supervisors in this study. A few examples of written comments that asked students to revise, edit, or use the correct and formal language included the following:

- "Please give attention to the language, format and style of your writing."
- "You still have to do a lot of editing and proofreading."
- "There are still a number of language problems."

Taken together, the present study examined the focus of supervisors on their students' theses in the final section of the study and found that supervisors exhibited little or no attention to linguistic accuracy and appropriateness to students' theses. However, apart from developing a close rapport with their students, supervisors' written feedback can also help foster the students' linguistic capability. The result of this study in this regard is in sharp contrast with previous research by Bitchener et al (2011), who asserted that linguistic features, such as grammar, imprecise or vague vocabulary, and coherence were more specifically focused. The study also indicated that supervisors provide feedback on linguistic issues at the sentence level, discourse feedback at the paragraph level, and feedback on what is expected and required for the different parts of a thesis.

Data from examples of supervisors' written feedback on student theses illustrated to what extent feedback was given on the accuracy, completeness, and relevance of the content included in each section of the thesis, as well as the linguistic accuracy and appropriateness of the final drafts. The focus of the present study was not the effect of supervisors' different types of written feedback to improve students' theses writing. Rather, it was aimed at understanding the types of written feedback most frequently used by the supervisors as part of the dialogic communications with their students.

Feedback Focus on Student Theses across TEFL and Media and Communications

This section of the study presents the findings related to the types of written feedback on which supervisors across the two disciplines focused when they provided written feedback on student thesis writing. The first interesting theme arising from the analysis of feedback from the two disciplines that was observed from the samples of supervisors' written feedback was the focus of comments with regard to content knowledge on student thesis writing. The comparison results of the overall focus of supervisors on providing feedback to their students concerning content knowledge showed that supervisors from TEFL and Media and Communications shared similar concerns (27.72 % and 28.71% respectively), and the consistency of such comments were clearly observed throughout the students' papers.

The result of this study was particularly enlightening about the focus of supervisors' written feedback. It was found that little or no attention was devoted to commenting on the linguistic accuracy and appropriateness of a student thesis from either TEFL and Media and Communications. From the shared experience, the researcher had hypothesized that language supervisors from TEFL might favor feedback on linguistic accuracy and appropriateness. Regardless of disciplines, however, the result of this study was not corroborated by the notion that the supervisors' experiences might differ with regard to the discipline. Surprisingly, supervisors from Media and Communications exhibited more commitment to comment on matters of linguistic accuracy on a student thesis writing (14.85 %) than supervisors from TEFL (11.96%).

Implications

From the literature, the importance of written supervision for the improvement of student theses has been emphasized. Regarding this, the results of this study showed that examining the language functions supervisors use to communicate with their advisees is helpful to understand the effectiveness of current supervisory practices. Given that the written feedback the supervisors employed was directed toward the graduates' thesis writing improvement, the findings of the present study may have implications for supervisors to further strengthen the other functions of feedback, especially expressive approval as this function of

language on their supervision was rare. Providing positive feedback is one of the most helpful and natural processes of learning.

Taken together, the fact that the language function of expressive disapproval the supervisors used outnumbered the expressive approval function in the corpus proves that the supervisors' written feedback collected for this study does not consider the psychometric expectations of their students. Thus, it is imperative to suggest that supervisors need to revisit their feedback mechanism as the student's ability or willingness to do the feedback might depend on the emotional impact of feedback (Layder, 1997). Their motives to do so or not may result from either positive responses, such as deep consideration of the feedback and reasoned rejection of it, or negative responses, such as distrust of the feedback provider (Price et al., 2010).

Conclusion

Based on the data obtained from the actual written supervision, one may conclude that the supervisors almost never value expressive approval speech functions as part of written feedback. While the supervisors excessively employed directive clarification, little or no attention was given for the expressive approval of language functions in their written communication with students. Even if very few of them appeared to be observed in some of students' thesis, the comments were mostly either described in brief or subjected to contradiction with their alignment with other forms of feedback, as in, "It looks good but lacks clarity."

Further, a wide range of supervisors' practices concerning the functions and types of written feedback were observed in the students' theses. These practices that were most frequent for an individual supervisor were consistently the same for other supervisors, indicating that supervisors communicated with their respective advisees in a similar trend throughout the written feedback.

A few words need to be said about the supervisors' experience and the account of the sample written feedback that mirrored the existing supervision practices. The present research aimed at examining the language functions and the type of written feedback most frequently used by eight supervisors at the Faculty of Humanities, Bahir Dar University on students' theses. The most frequently mentioned areas of written feedback provided by the supervisors in order of priority were written feedback on genre of the thesis, content knowledge and linguistic accuracy and appropriateness.

In higher education, communication is the principal means that enables universities to meet a broader range of academic goals including promoting interaction and discussion among various disciplines. Therefore, the informational role as well as the pedagogical implication of this study is not limited in the two

disciplines under this study. The study had rather attempted to shed light on broad curricula across many departments in higher education in general. As a whole, the present research was designed to supplement the overarching academic research and reinforce cross-departmental understanding in higher education by examining the types of language functions, which is at the heart of tertiary education, supervisors use to provide feedback to their students in thesis writing.

However, the findings of this study may not be generalized to other universities, and hence have implication for future research. This study touched upon a possibility of using evidence of feedback from samples of students' theses, and hence there are numerous reasons to pursue further research that could shed light on the strengths of using questionnaire and interview and including fair number of supervision practices in various departments.

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A STE[A]M Approach to Teaching and Learning

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Since the advent of STEM (Science, Technology, Engineering and Math) programs, first in K-12 and now in college curricula, many variants of STEM have arisen to include other disciplines in developing cross-disciplinary literacy among students. This paper briefly defines our own variant STE[A]M branch within the context of cross-disciplinary teaching and learning and then describes an interdisciplinary course, The Science in Science Fiction, in which professors of Biology, English, and Physics provided a range of science fiction texts which undergraduate and graduate students studied and discussed in depth. Students then produced and presented collaborative cross-disciplinary research on topics of their choice from the course work. Finally, students provided input on their experiences with collaborative cross-disciplinary teaching and learning. The overall effect was extremely positive. This article provides a framework for other faculty who would like to model this approach.

According to the United States Government Accountability Office (2005), the current STEM—Science, Technology, Engineering, and Math—Program in the United States began as a K-12 initiative "to collapse the teaching of these subjects individually by using a more interdisciplinary approach to learning, and this was in response to growing concerns that American students were not keeping pace with other students from other countries in these fields" (p. 11). The central aim of the first STEM programs was to "improve teacher quality" by providing educators with an expanded and more integrated knowledge base for their teaching (p. 11), or, in other words, with "cross-disciplinary literacy" (p. 11), which has since become a term within the Common Core (Common Core State Standards Initiative, 2015).

However, since its inception, STEM interest has broadened into post-secondary education as demand for highly skilled graduates has been on the rise (Dugger, 2010), and its offshoots are responses to a growing contemporary awareness that more interplay and integration among disciplines provide more student involvement and interconnected learning, not only for teacher education students, but also for students across fields and levels of education:

> The Committee on STEM Education (CoSTEM), comprised of 13 agencies—including all of the mission-science agencies and the Department of Education—are facilitating a cohesive national strategy, with new and repurposed funds, to increase the impact of federal investments in five areas: 1.) improving STEM instruction in preschool through 12th grade; 2.) increasing and sustaining public and youth engagement with STEM; 3.) improving the STEM experience for undergraduate students; 4.) better serving groups historically underrepresented in STEM fields; and

> 5.) designing graduate education for tomorrow's STEM workforce. (U.S. Department of Education, 2015)

In conjunction with these aims and to broaden them, American colleges and universities have expanded this approach. Examples include STE[A]M for Science, Technology, Engineering, Art & Design, and Math (RISD Academic Affairs: STEM to STEAM, 2017) and STEAM-H for Science, Technology, Engineering, Agriculture, Math and Health (Virginia State University, 2005). Our particular variant is STE[A]M, Science, Technology, Engineering, the Arts, and Math, in which "the Arts" include literature, film, visual imagery, and other media to provide additional context and critical thought in our science-oriented literature course.

Literature Review

The Critical Interplay of Arts and Sciences

Engaging artistic imagination and scientific interplay is not new, and humans' centuries-old fascination with flight is a case in point. For example, 2000 years ago the Roman poet Ovid imagined the inventor Daedelus's crafting and use of artificial wings (Book II: lines 71-95), and other imaginative writers envisioned methods of flight and space exploration centuries before these creative ideas were made real by modern science and technology. As Stephen Hawking (1995) notes in his Forward to Lawrence Krauss's *The Physics of Star Trek,* "Science fiction […] is not only good fun, but it also serves a serious purpose, that of expanding the human imagination. . . Science fiction suggests ideas that scientists incorporate into their theories . . ." (pp. xi-xii). Indeed, Einstein revealed, "When I examine myself and my methods of thought, I come close to the conclusion that the gift of

imagination has meant more to me than any talent for absorbing absolute knowledge" (Calaprice, 2000, p. 22). The versatile Leonardo DaVinci also depended on this kind of interplay:

> Leonardo made the faculty of vision—or more precisely, the gift and patience of intensive observation—the foundation of both his scientific investigations and his work as a figural artist. He was a protoscientist in the modern sense of what constitutes science, bringing to his investigation of the natural world not only an extraordinary artistic imagination, but a unique and idiosyncratic intellectual position that helped him to circumvent the mental blocks of his contemporaries. (Ackerman, 1998, p. 207)

Not only is this interplay not new, it is not unusual. Chemist and Nobel Prize recipient Robert Woodward (2003) asserted that aesthetics provided an essential impetus and insight for his groundbreaking work and then noted the following revelation about his colleagues at Harvard:

> It was many more years, however, before I realized that the kinds of personal aesthetic experiences I had been accumulating were common to other scientists. Many had a visceral, sensual love affair with their experimental and even theoretical work. Concepts of simplicity, symmetry or asymmetry, elegance, and beauty were common . . . Few colleagues spoke publicly about such things. It therefore came as a revelation to discover just how completely aesthetic considerations and experiences permeate chemistry and other sciences, their teaching, learning, and meaning. (pp. 37-38)

However, while these examples illustrate the relevance of art to science and vice versa, and while some scientists make innate connections between aesthetics and scientific study, the skill of knowledge enhancement through such interplay between art and science is perhaps not always innate and, thus, for many requires essential training. Root-Bernstein et al. (2008) assert the importance of an interdisciplinary curriculum that includes the arts as particularly critical for future scientists as well as for society, and they express concern over the effect of a lack of arts education for students of science: "The utility of arts and crafts training for scientists may have important public policy and educational implications in light of the marginalization of these subjects in most curricula" (p. 51).

Indeed, understanding, emphasizing, and utilizing the interplay between science and art will have profound effects for the future for societies on an international scale, and according to Carol Neves (2010), Director of the Smithsonian's Office of Policy and Analysis, academia must play a role in this future. In the Preface of the Smithsonian Institution's 2010 report, *Interplay of Perspectives: History, Art & Culture + Science, Interdisciplinary Crossover and Collaboration* she asserts:

> Few would dispute the notion that many of the problems that the world faces today are large and complex. Solving them requires a strong intellectual orientation that draws upon history, art, culture and science. Major universities and a few other institutions have the potential to transcend disciplines, and when they do, much of their interdisciplinary work occurs outside formal channels (p. 1).

In short, a societal need exists for interplay and interconnectedness among arts and sciences which will enhance future leaders' abilities to effectively solve complex problems. This course and courses like it foster that interconnectedness which ultimately enhances students' learning and their abilities to contribute to society in meaningful ways.

The Development and Teaching of Science Fiction Courses

While science fiction has existed for millennia, it was not taught as a specialized course on a collegiate level until the mid-twentieth century. Lester Del Rey (1979), science fiction author and documenter of the genre's growth in America, asserts the following:

> The first college course on science fiction that I can discover was given as a night school course at City College of New York Extension School; this began in 1953 and was conducted by Sam Moskowitz . . . Certainly this was the oldest continuing course on science fiction. At that time, Moskowitz had no difficulty in securing such writers as Heinlein and Asimov as guest lecturers (p. 224).

In *In Memory Yet Green: The Autobiography of Isaac Asimov*, Asimov (1979) supports this assertion: "I drove into New York to oblige Sam Moskowitz who was giving a class in science fiction . . . Sam's class may have been the first college class in science fiction" (p. 692). Forty-three years later the article "North American College Courses in Science Fiction, Utopian Literature, and Fantasy," by Arthur Evans (1996), was published in *Science Fiction Studies*, and in it he listed 404 science fiction courses in the U.S. as well as Europe. He also included addenda of the most frequently assigned texts. At the end he notes, "At the

heart of science fiction lies a speculative energy" (Evans, 1996). It is this energy that fuels the inherently interdisciplinary science fiction course. However, it has its challenges. As John Woodcock (1979) observes, "Few courses combine such high hopes, on the part of both students and faculty, with such a variety of teaching challenges," and he includes among them students' anxiety regarding disciplines like math, as well as the professors' struggle with "the classic literary question of realism in a way that is meaningful for works that are fantastic, or predictive, or both,"

Despite these challenges, science fiction offers diverse opportunities for learning across disciplines in academia, and one chief reason for this is the versatile nature of the genre itself. As Gunn (1996) notes, science fiction is "inclusive" of other genres from the "detective story" to the "love story" to the "adventure story" (p. 377), and as such it can incorporate academic subjects such as "social and physical sciences, history, ideas, futurology, religion, morality, ecology, reading skills, and many others" (p. 377). McBride (2016) explored the positive effects of linking science fiction and physics courses. Also, in teaching an "interdisciplinary" science fiction course "with an emphasis on ethics of technology and science," Layton (2010) notes that this "helps break student misconceptions that every course is a unique event unrelated to other courses" (15.1341.9). Finally, Pease (2009) observes the following: "Science fiction offers many opportunities to exercise the moral imagination, through attempts to anticipate future technological developments and to explore both the benefits and dangers of these developments. The genre is also fertile with ground for exploring human relationships, treatment of the Self and the Other, as well as environmental issues, just to name a few examples" (p. 75).

Method

The Science in Science Fiction

The science fiction course was developed by professors of Biology, Physics, and English and was open to undergraduate students in English and Biology and graduate students in the Masters of Arts in Teaching Biology, Master of Arts in Teaching English, and the Master of Arts in Liberal Studies. Course participants initially included five English majors and four biology majors, but two students from each major could not complete the course. The class met two evenings a week for one semester.

Active Learning Approaches

The course focused on active learning, a general term for student-centered learning in which the student constructs knowledge by building on hands-on learning

experiences rather than absorbing knowledge passively from traditional external sources such as lectures. Active learning includes cooperative and collaborative learning.

The ground-breaking research of Chickering and Gamson (1987) found that active learning is superior to traditional forms of instruction:

> Learning is not a spectator sport. Students do not learn much just by sitting in classes listening to teachers, memorizing prepackaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences and apply it to their daily lives. They must make what they learn part of themselves . . . Active learning is encouraged in classes that use structured exercises, challenging discussions, team projects, and peer critiques. (p. 1)

Drawing upon Chickering and Gamson's seminal research, Bonwell and Eison (1991) assert that "students must do more than just listen. They must read, write, discuss, or be engaged in solving problems. Most important, to be actively involved, students must engage in such higher-order thinking tasks as analysis, synthesis, and evaluation" (p. 1). The authors summarize active learning as use of "instructional activities involving students in doing things and thinking about what they are doing" (Bonwell & Eison, 1991, p. 1). Mayer (2002) refers to active learning as "meaningful learning" which "occurs when students build the knowledge and cognitive processes needed for successful problem solving" (p. 226). Collaborative learning is defined thusly:

> [It] is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together . . . Collaborative learning activities vary widely, but most center on students' exploration or application of the course material, not simply the teacher's presentation or explication of it." (Smith & MacGregor, 2015).

Cooperative learning has been defined as "a teaching strategy in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject" (Balkcom, 1992).

Course Organization

Given the diverse disciplines of the students and of the faculty members whose grading systems might vary according to discipline, we had to ensure that the syllabus was thorough and explicit from the outset with a complete schedule of class activities, course texts,

course policies, individual and group assignment instructions, and grading rubrics with detailed grade assessment methods for all assignments (see examples at Appendix A). The syllabus was lengthy, but we needed to make sure that we were clearly focused on the course content, on active student-centered learning, and on our expectations from the students as well as ourselves. The texts were selected according to the expertise of faculty members, so in the course there was emphasis on physics, biology, and literary concepts and theory. Texts were listed and studied in chronological order beginning in the eighteenth century and ending in the 21st century so that students could understand the development of science fiction as a genre and recognize the connections among texts and the historical contexts in which they were written.

In addition, from the outset of the course we used Desire2Learn (D2L), an online course delivery system, for practical purposes such as the Dropbox for delivery of assignments, but the greater purpose of D2L was to provide both some course texts and all scientific, literary, and contextual discussion questions each week for students to contemplate while reading the works in order to prepare for that week's class discussions. All three instructors provided questions for each reading. Students were also provided with links to sites both to increase their understanding of a work and to broaden their perspectives beyond the immediate context of the work itself, including beyond the medium in which it was produced. Thus, students were encouraged to use both course texts and additional online resources to prepare themselves for in-class discussions. The links to online sites also aided students' pursuit of their own interests associated with the literature texts, an independent active learning process which we strongly nurtured and encouraged.

Class Activities

The class met two evenings per week, and collaborative learning using various means was woven into the texture of every class session. For a few classes, a professor gave a 10- or 15-minute mini-lecture at the beginning to provide necessary context (e.g., the biologist reviewing a biological concept presented in a reading), but this was the rare exception rather than the rule. Usually, and with faculty members' encouragement, students participated in each lively open class discussion based on question responses in D2L, as well as on additional explorations that students had made beyond D2L.

Students also had regular short explication assignments to aid in the class's understanding of a particular topic in the reading(s). One example among many includes our study of Nathaniel Hawthorne's (1844) 19th century short story, "Rappacini's

Daughter," in which a prominent scientist exposes his daughter to poison from birth so that the only mate she could have in life would have to be similarly poisoned and thus immune to her touch: all others would die. As an assignment for this text, students engaged the class by reporting on the nature and functions of various poisonous plants and relating those characteristics to the plants in the story's description, and both faculty members and students discussed in depth the literary, moral, and philosophical facets of the story as well as the placement of the story in the development of science fiction as a burgeoning genre.

Another example was our study of Joan Slonczewski's *A Door into Ocean* (1986), in which a female race, the only inhabitants of an ocean planet, defeat a belligerent invading force by entirely peaceful means. Following our classroom activities related to this text, both faculty members and students participated in a Skype interview the author, who is a Professor of Biology at Kenyon College, and we all learned a great deal about both the physiognomies which she devised for her characters and the relationships they bore to actual biology, as well as the considerable influence of the time period in which she wrote the novel.

In addition, we provided film clips of movies, and as a class we all discussed the interplay between written and film genres, especially in light of historical contexts as well as advancements in film production. For instance, we read H. G. Wells' *The Time Machine*, and after our collaborative learning class session, we spent an additional class viewing clips of the novel's film adaptations which clearly reflected both the technological advancements in film making and the serious concerns weighing upon the society at the time of the film's production. A case in point: students found social and political concerns reflected in the alterations of crises depicted in the film, e.g., the fear of a nuclear exchange in the 1960 Cold War version versus the caricatured sadistic arch-enemy in the 2002 pre-Iraq War version.

Major Research Projects

Students were required to produce three major projects for the course: one individual written assignment and one team project produced in written and oral forms. The first assignment, a research paper in which each individual student addressed a work or works, was focused on assessing each student's independent knowledge and writing ability. Given the variety of students from the arts and sciences, we deliberately gave them leeway on how they wanted to approach this paper through scientific or literary lenses. This assignment gave us a sense of students' interests as well as their knowledge base in their major subject and their writing abilities.

Table 1
Student Assessment of Learning Gains

After completing the Science in Science Fiction course how much did you GAIN in the following areas?	No gains	A little gain	Moderate gain	Significant gain
1. Integrating your knowledge from disciplines in Science, Technology, Engineering, the Arts, and Mathematics (STEAM) to facilitate interpretation of literary works and to grasp implications in larger scientific, social, and other contexts beyond those works.	A	B	C 2	D 3
2. Demonstrating your critical thinking skills in interpreting texts.	A	B	C 2	D 3
3. Demonstrating your advanced written and oral communication skills required at the graduate level.	A	B	C 2	D 3
4. Demonstrating your ability to engage in thoughtful and informed class discussions.	A	B	C 2	D 3
5. Producing papers and other materials that illustrate research, interpretive, and communication skills.	A	B	C 2	D 3
6. Communicating ideas to others outside your discipline and your ability to collaborate with those in other disciplines.	A	B	C 2	D 3
7. Identifying and describing the relationships among science, art, literature and society.	A	B	C 2	D 3
8. Explaining the interplay among texts and multimedia works (film, art, interviews, etc.).	A 1	B	C 1	D 3

The course's major team research project, which included both a paper and a class presentation at the end of the semester, involved an examination of a subject from our readings from two or more interdisciplinary perspectives in the STE[A]M fields of Science, Technology, Engineering, the Arts (including literature, film, etc.), and Math. Since this was an interdisciplinary assignment, the faculty members grouped together students of different disciplines. Thus, this assignment included both collaborative and cooperative learning, and it was the most challenging for the students and us as well.

Results

Grades

Using the rubrics provided in the syllabus and at the end of this article, all three faculty members determined the grades for each assignment, as well as the final grade. Each of the faculty members graded each student's work individually. Then we met together, compared and rationalized assessments, and reached a final group consensus on each student's grade. Grades assigned to each student in the course were consistent with the standards delineated in the syllabus (Vanderbilt University Center for Teaching, 2016). Three students earned A's while two earned B's, so all produced either excellent or above average work in the course.

Student Assessments

At the end of the semester, following NIH regulations and with our Institutional Review Board (IRB) approval, all of the students participated in a Student Assessment of Learning Gains (SALG) survey, which measures "student reported cognitive growth" (Guadalupe, 1999, p. 499). Guadalupe Anaya's (1999) research concludes that "comparable results are obtained when using the college GPA and standardized test scores" (p. 499). The instrument included the assessment of individual Learning Gains, a section on the Impact of Taking Part in the Science Fiction Course, and a section of Open-ended Questions. In particular, the SALG asked students to assess and report on their own learning, as well as on the degree to which specific aspects of the course had contributed to that learning. This instrument sought not only data about student success in the subject matter, but also their measure of the success or failure of interdisciplinary learning in the course.

Learning Gains. "'Learning gain' is defined as the improvement in knowledge, skills, work-readiness and personal development made by students during their time spent in higher education" (Higher Education Funding Council for England, 2016). In the Learning Gains Assessment, students circle A, B, C, or D to provide their measure of learning gains. The cumulative results of our students' Learning Gains Assessment are provided in Table 1.

Table 2
Impact of Taking Part in the Course

Rate how much you agree with the following statements.	Strongly disagree	Disagree	Agree	Strongly agree
9. The diversity among faculty members' disciplines was useful to the class.	A	B	C	D 5
10. The discussion questions proved helpful in guiding a cross-disciplinary reading of the course texts?	A	B	C	D 5
11. The lecture material proved helpful in explaining the scientific concepts in the texts.	A	B	C	D 5
12. The teamwork (cooperative learning) proved useful.	A	B	C	D 5
13. The additional multimedia resources provided, e.g., the skype interview with Dr. Joan Slonczewski, videos, movie clips, etc, enhanced your understanding of the texts.	A	B	C	D 5
14. My participation in this project helped to prepare me for my future career.	A	B	C	D 5

Of the five respondents, three (60%) reported significant gains in each of the 8 categories on the chart while two reported significant or moderate gain in each category with an exception: one student reported no gain with category #5. This student cited his or her issue with team projects in the open-ended questions section as the reason for this difficulty.

Impact of Taking Part in the Science Fiction Course. The instrument below provided statements on the impact of the course on individual students, and students indicated their level of agreement with each statement, as indicated in Table 2.

All of the students (100%) strongly agreed with each statement in the survey.

Open-ended Questions. The Open-Ended Questions offered students an opportunity to include information that could not be provided by the instruments above. The questions and responses were as follows:

15. What would have made your experience in this course better?

- "I feel that the course was both diverse and well rounded. Overall, the course was fantastic. If I had to suggest anything, I would probably suggest adding more disciplines such as a psychology or sociology professor, maybe a lecturer?"
- "Maybe more interactive activities, PowerPoints, and presenting to each other."
- "Having a social science point of view."

16. Did you make other gains from doing this project that we didn't mention? If so, briefly describe.

- "I felt that the course material was very eclectic and covered a range of diverse material."
- "Now that I have completed the course, I will consider reading material outside of my discipline."
- "It is beneficial to reflect on other disciplines for a well-rounded education, but often majors become a way of life."
- "Yes, understanding how disciplines interrelate and provide an understanding how to explain these other disciplines."
- "I learned the importance of being able to explain yourself thoroughly on paper instead of sticking only to the facts."

17. In some detail, provide your thoughts on the planning and production of the interdisciplinary team projects (collaborative learning) for the course.

- "I enjoyed working with classmates of other disciplines. The only dilemma I had was that we dedicated so much class time to the group project that I was not able to focus on my individual project as much. I felt that the criteria and expectations were clearly expressed. No complaints."
- "The flow of this class is excellent and novel/short story choice is excellent."
- "The collaborative project should have been produced before the individual project. This would allow for a more concentrated effort to make points in

theory in the individual that may have been overlooked in the group."

- "It should have been longer time frame to work on team projects."
- "Okay, so that was a complete disaster. It shouldn't have been. In theory, it should have been a great experience, but a (possibly anomalistic) difference in competency and commitment levels – and maturity – created an experience that nearly outshone the positive experience of the rest of the course."

18. Please provide any additional comments or insights regarding the course and/or interdisciplinary teaching and learning.

- "Great job!"
- "Make sure the professors are on the same page when making decisions concerning dates things are due."
- "Do more interdisciplinary courses. Silos are damaging and ridiculous."

Discussion

The science content that was introduced to the Science in Science Fiction class was distinguished from what one might learn in a more typical STEM class in that some of the material was much more highly speculative, dealing with possible revisions to known laws of physics and biological reality. This included time travel, the existence and prevalence of extraterrestrials and parallel universes, and unusual reproductive practices. However, these fictional aspects allowed the instructors to introduce the actual scientific concepts and required students to contrast those with the speculative science presented in the texts. Additionally, the texts introduced realistic scientific aspects in sensationally creative ways, such as mutualistic symbiosis, evolution, gene expression, and microbiomes. The speculative science and the adaptation of actual science in creative ways effectively engaged the students in learning a variety of scientific topics that would otherwise have been less appealing and interesting.

In addition, anecdotal evidence suggested that there were students who, upon entering the course, clearly did not appreciate some academic disciplines, but these attitudes changed. For example, early in the semester, when the class was reading 18th century precursors to science fiction, one biology student acknowledged in a class discussion that she had no appreciation for fiction or allegory. However, based on unanimous responses in the survey data at the end of the semester, she had altered her opinion. Much later in the semester, in a follow-up discussion after the physics professor's

explication of Greg Egan's "The Infinite Assassin," one English student acknowledged that she had never appreciated the arguments or aesthetic appeal of higher math before encountering Cantor's Diagonal Argument.

Students were given discussion questions to consider prior to class meetings and were expected to engage in discussion generated from these questions. Given the small size of the class, students could not easily avoid participating in the discussion. For a larger class it would be ideal for instructors to design a means for assessing participation. For example, each student can be assigned to lead a discussion on one or two specific questions for the entire class during the course of the semester. Alternatively, students can work in groups to answer questions with professors migrating from one group to another to join their discussions. Then the class as a whole can come together to share their responses. For the group project presentations students worked in pairs, but with a larger class size the projects can easily be adapted to groups of three or four. It is not recommended that the course be scaled to larger than 24 students given the writing and discussion intense nature of the course.

In addition to the small class size, this course also included a very diverse population of students, both academically and socially. The class included both graduate and undergraduates in different fields. Sixty-three percent were older than typical college students, 75% were women, 50% were underrepresented minorities, 50% had a strong science background, and 50% had strong backgrounds in the humanities. These differences added dimension to students' interpretations and discussions, thus broadening their overall learning.

The instructors selected the texts, and they were predominately written by white male authors (75%). This was attributed to the fact that historically science fiction has been dominated by white male authors. In the future it would be ideal to allow the students to choose some of the texts covered in the course with the expectation that they may select texts from a more diverse group of authors. Despite the fact that the texts were written by largely white male authors, the discussion topics generated in the course treated a wide range of issues and were covered from diverse points of view.

As is typically the case, some students were challenged with the collaborative project presentation. While collaboration is an essential skill to learn and practice, some students do not manage it well and require more time than expected to design and build a collaborative presentation. Two students commented on how the group project diverted their attention away from their individual research papers since they were required to spend a large amount of time collaborating with their team members. The collaborative presentations and the individual research papers were due at the end of the term. The authors recommend

separating the due dates so that one assignment does not distract attention away from the other.

Limitations and Effects

Limitations include the fact that the course has been taught only once thus far. Also, some might ask how such a small class could address the wider problem of how to use the arts in STEM. However, one could argue that since most of our students are preparing to become teachers themselves, there may be a "multiplier effect" of their becoming adept at cross-disciplinary thinking as their teaching of their own students is affected.

As the SALG results show, the class had a positive or very positive effect on the students, with all students except one reporting significant or moderate learning gains, and 100% of students strongly agreeing that the course had significant impact on their learning. Students called the course "fantastic" with "eclectic" and "diverse material," and they noted that the "flow" was "excellent." In addition, the effect of the class on the three professors themselves would have to be considered significant given the low student enrollment. The class may well have broadened our views of other disciplines, students in other disciplines, and teaching in other disciplines. Thus, the effect of the course on the professors should also be measured when the class is taught again.

Conclusion

Science fiction is the literary form that unites both logic and intuition through language, and thus it provided the successful interplay of art and science in The Science in Science Fiction course. As pointed out by one student, silos can indeed be "damaging and ridiculous." Providing students with the opportunity to learn from an interdisciplinary approach certainly increases student engagement in the material and enhances students' learning, their ability to approach complex problems creatively, and perhaps their ability to contribute to society in meaningful ways.

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Appendix A
Course Schedule

Week	Text and/or Activity
1	• Discussion "August, 2026: There Will Come Soft Rains" by Ray Bradbury • Discussion "Micromegas" by François-Marie Arouet (Voltaire)
2	• Discussion "Rappacini's Daughter" by Nathaniel Hawthorne and comparison to Poison Ivy comic from the *Batman* series
3	• Discussion *Frankenstein* by Mary Shelly and comparison to *Young Frankenstein* (film clips)
4	• Discussion *The Time Machine* by H. G. Wells
5	• Discussion *Starmaker* by Olaf Stapleton
6	• Discussion *Starmaker* by Olaf Stapleton
7	• Discussion *A Door into Ocean* by Joan Slonczewski
8	• Discussion "Blood Music" by Greg Bear (short story adapted from the novel Blood Music) • Group Collaboration time (project planning 1)
9	• Discussion "Blood Music" by Greg Bear (short story adapted from the novel Blood Music) • Group Collaboration time (project planning 2)
10	• Discussion "The Hundred Light Year Diary" by Greg Egan • Discussion "The Infinite Assassin" by Greg Egan
11	• Discussion "The Infinite Assassin" by Greg Egan • Discussion "Learning to be Me" by Greg Egan by Greg Egan
12	• Discussion "All You Zombies" by Robert Heinlein • Discussion "The Last Question" by Isaac Asimov • Individual Research Papers Due
13	• Group Collaboration time (project preparation 1) • Discussion "The Ones Who Walk Away from Omelas" by Ursula LeGuin
14	• Discussion "A Simple Greeting" by Caw Miller • Discussion "The World Without Us" by Alan Weisman • Group Collaboration time (project preparation 2)
15	• Final Project Presentations on May 3rd, 5-7 p.m.

Appendix B
Discussion Rubric

	Excellent	Good	Marginal	Unsatisfactory
	100	**82**	**64**	**0**
Promptness and Initiative	Consistently starts discussions; demonstrates good self-initiative and participation	Starts some discussions; responds/participates most discussions	Rarely participates; limited initiative	Does not participate
Delivery	Consistently uses grammatically correct language	Few grammatical errors in speaking	Numerous grammar errors in speaking	Grammar errors in every delivery
Relevance	Consistently focuses on discussion topic; connects with additional references related to topic	Frequently focuses on relevant discussion content; prompts further discussion of topic	Occasionally speaks off topic; discussion efforts are brief and offer no further insight into the topic	Consistently speaks off topic
Expression	Expresses opinions and ideas in a clear and concise manner with obvious connection to topic	Opinions and ideas are stately clearly with occasional lack of connection to topic	Unclear connection to topic evidenced in minimal expression of opinions or ideas	Does not express ideas
Contribution to the Learning Community	Is aware of needs of class community; frequently attempts to motivate the group discussion; presents creative approaches to topic	Frequently attempts to direct the discussion and to present relevant viewpoints for consideration by group; interacts freely	Marginal effort to become involved with group	No contribution

Note: The column header for the table is titled "Discussion Rubric".

Appendix C
Team Research Project Presentation and Paper Instructions

The team research project will be a collaborative examination of a subject or subjects from our readings from two or more disciplinary perspectives in the STE[A]M fields of Science, Technology, Engineering, the Arts (including literature), and Math. **Students in different fields of study** will blend their research, analytical, and writing skills to produce their project, which could be the interplay of literary and scientific elements of a work, an analysis of the science and society of a given work in its time period, a comparative study of two works, the historical context of a work, the cultural contexts of a work, how a work is structured (plot twists, images, etc.) to enhance a particular interpretation of the work, or a particular theme dealt with in two or three works, or any range of additional possibilities. Topics must receive the approval of the teaching team. There are two components to the project: 1. Your team must present your project orally. 2. Your team must also provide a written report of the project.

Project Proposal

Your team must submit an abstract (summary) of your project and for your instructors to review and approve. The abstract must include the following components and should not exceed one page written in 12-point font:

1. Authors
2. Presentation title (not more than 100 characters in length)
3. Your objectives and description (be certain to include the literature you will be covering)
4. References

Research Guidelines

- You can use books/stories that we did not cover.
- Your individual research papers cannot cover the same texts that your team projects cover.
- Your presentations will be 15-20 minutes (you will have 5 minutes for Q&A after you present), and the Team Presentation grading rubric is below:

Team Presentation Grading Rubric				
	Excellent	**Good**	**Marginal**	**Unsatisfactory**
Content **Excellent = 30** **Good = 22** **Marginal =15** **Unsatisfactory = 0**	Information is appropriate with well-developed multimedia materials	Information is appropriate with main points somewhat developed	Information is off topic and development is poor	Information is very shallow or nonexistent with no development, or the presentation is not delivered at all
Organization **Excellent = 25** **Good = 19** **Marginal =10** **Unsatisfactory = 0**	Main points are clearly focused, well connected, and well organized	Frequently focuses on main points, but there are organization problems	Disorganized with content and/or speaks off topic extensively	Displays complete disorganization
Physical Expression and Style **Excellent = 25** **Good = 19** **Marginal =10** **Unsatisfactory = 0**	Displays engagement with topic and makes frequent eye contact	Displays some engagement and some eye contact	Topic engagement and eye contact are minimal	No topic engagement or eye contact
Vocal Delivery and Language **Excellent = 20** **Good = 15** **Marginal =10** **Unsatisfactory = 0** **Total _____**	Voice is clear and energetic, and there is consistent use of grammatically correct language and no hesitations.	Voice is adequate for the presentation but not engaging, and there are a few grammatical errors in speaking.	Voice displays little energy, and there are several grammar errors in speaking.	Voice has no energy, and there are major grammatical errors throughout.

Team Paper Guidelines

Papers must be composed using the default margins (1") and standard type (Times New Roman or Ariel 12) of MS Word. It must be 10-12 pages of text in MLA-style format **plus** a page or pages of Works Cited. The paper should actively use and cite at least ten sources outside our text itself, including at least two Internet sites and two traditional texts. Papers will be evaluated according to CSU Writing Guidelines.

Your particular choice of work(s) must be on the syllabus. Students in different fields of study will blend their research, analytical, and writing skills to produce their project, which could be the interplay of literary and scientific elements of a work, an analysis of the science and society of a given work in its time period, a comparative study of two works, the historical context of a work, the cultural contexts of a work, how a work is structured (plot twists, images, etc.) to enhance a particular interpretation of the work, a particular theme dealt within two or three

works, or any range of additional possibilities. The team paper is a written document that models your team research project presentation (described above) and will be assessed according to the CSU Writing Guidelines

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CSU Writing Guidelines Grading Rubric

Content: 35% of the paper grade   _____

- Fulfillment of the assignment's content requirements.
- Clear, focused topic
- Demonstrated familiarity with the subject matter.
- Range and quality of knowledge.
- Depth of assimilation and understanding of the subject matter.
- Sufficient and suitable content to support and develop ideas.
- Awareness of audience

Organization: 30% of the paper grade   _____

- Clear introductory, body, and concluding paragraphs.
- Unity and coherence.
- Support for focused topic
- Transitions that move the reader from key point to key point.

Mechanics, Grammar and Style: 35% of the paper grade   _____

- Format
- Punctuation
- Sentence Structure
- Grammar and Usage
- Competent use of standard English
- Style
- Diction

Total: _____

Comments:

Grading Rubric below:

Appendix D
Individual Research Paper Instructions

The individual research paper may address a work or works through the lens of STE[A]M or through another framework which interests the writer. Your possible subjects/treatments might be the interplay of literary and scientific elements of a work, an analysis of the science and society of a given work in its time period, a comparative study of two works, historical context of a work, the cultural contexts of a work, how a work is structured (plot twists, images, etc.) to enhance a particular interpretation of the work, or a particular theme dealt with in two or three works, or any range of additional possibilities.

Topics must receive the approval of the teaching team. For this, you must submit an abstract (summary) of your project and for your instructors to review. The abstract must include the following components and should not exceed one page written in 12-point font:

1. Research paper title (not more than 100 characters in length) *[Note: this can be modified later as we know it can be challenging to develop a perfect title early in the process.]*
2. Your objectives and description (be certain to include the literature you will be covering)
3. References

Research Paper Guidelines

1. A student's individual research papers cannot cover the same work(s) as that student's team research paper/presentation.
2. Papers must be composed using the default margins (1") and standard type (Times New Roman or Ariel 12) of MS Word. It must be 10-12 pages of text in MLA-style format **plus** a page or pages of Works Cited. The paper should actively use and cite at least ten sources outside our text itself, including at least two Internet sites and two traditional texts.
3. Be sure that your internet sources are authoritative sources.
4. Your particular choice of work(s) must be on the syllabus.
5. Your paper will be assessed according to the CSU Writing Guidelines Rubric.

Gamification as Design Thinking

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Gamification, which introduces game mechanics into a non-game setting, has been considered a potential way to improve student learning, motivation, and engagement. Empirical studies of gamification often focus on students' outcomes and/or their perceptions of the gamified system while giving less attention to the rationale behind the conceptualization and design process itself. This article uses gamification as a lens through which to re-imagine a learning environment, drawing on design thinking methods of problem solving. Design thinking is an approach to addressing "wicked problems" that do not have simple, right answers. By using gamification as a form of design thinking, this article explores ways that gamification can help instructors take apart and re-configure courses that are challenging to design, using a graduate-level online philosophy course as a worked example. Readers are provided the rationale behind the iterative prototypes and the culminating reflection of the process. The article concludes by arguing that gamification's contribution is not limited to student outcomes and that it can be also be used as an innovative approach to course design.

Game-based learning, gamification, and other game-inspired approaches to education bring together two strands of research that have made important contributions to learning and instruction in recent years: play and design. Neither of these are new areas of study, but the success of digital games has re-invigorated interest among educational researchers to find ways that play and/or design can be integrated meaningfully into learning environments. Of all the approaches to games and learning, gamification may be considered the most controversial (Deterding, Dixon, Khaled, & Nacke, 2011). While it has found success in the business, apps, fitness, entertainment, and digital gaming (Burke, 2014; Kapp, 2012; McGonigal, 2011; Zichermann & Cunningham, 2011), some have criticized this success as exploitation (Bogost, 2011; 2015) and an over-simplified approach to games and design (Robertson, 2010).

Gamification does not seem to have translated its success as a marketing tool to formal learning contexts, despite the fact that traditional classrooms already resemble gamified environments in many ways (de Byl, 2013). In higher education, gamification seems to have most measurable impact on student participation/attendance (Barata, Gama, Jorge, & Goncalves, 2013; Caton & Greenhill, 2014; O'Donovan, Gain, & Marais, 2013; Wiggins, 2016) and performance (Fanfarelli & McDaniel, 2017; Landers & Landers, 2014), but students' perceptions of gamification are mixed (Berkling & Thomas, 2013; Haaranen, Ihantola, Hakulinen, & Korhonen, 2014). It makes sense for empirical studies on gamification to focus on student gains. However, gamification might serve another, and arguably more useful, purpose. To the extent that a gamified class is carefully designed, the design itself is an object of interest, as it exposes the values, intentions and biases of the designer. The process of gamifying a class, in particular the decisions that go into what behaviors get rewarded or penalized, how the gamified system is presented, and how users are expected to interact, can be a useful feedback system for the designer/instructor and the students (Hung, 2017; Hung et al., 2017; Nicholson, 2015).

This article presents how design thinking and gamification were used to improve upon a difficult graduate level philosophy course. Design thinking is described as a way to approach ill-structured (Simon, 1973) or wicked problems (Buchanan, 1992; Rittel & Webber, 1973). Like gamification, it has been used in a variety of contexts, including architecture and urban planning (Rowe, 1987), business (Brown, R. L., 2009; Brown, T., 2009), social issues (Manzini, 2015), and education (Bereiter & Scardamalia, 2006; Carroll et al., 2010; Collins, Joseph, & Bielaczyc, 2004; Leinonen & Durall-Gazulla, 2014; Scardamalia & Bereiter, 2014). First, I provide an overview of design thinking and the steps involved in applying it to a class of problems known as ill-structured or wicked problems. Then I describe the particular problem I faced and how design thinking and gamification were applied to address the problem. Finally I discuss the results I gathered from the design process itself, what it revealed about my instructional practice as it was implemented and why I believe gamification, when combined with design thinking, can be a productive way of improving upon a course.

Literature Review

Design Thinking

Design thinking emerged in the 1960s and 1970s as a way of addressing problems brought on by an increasingly complex and technological society (Dorst, 2006; Stewart, 2011). Herbert Simon defined "ill-structured problems" (Simon, 1973; 1996) as problems that have incomplete information, unclear goals and boundaries, and tendencies to evolve over the course of problem-solving (Voss, 1988). For Simon (1996), design is part of any profession that involves "changing existing situations into preferred ones" (p. 111) and not

limited to the design material artifacts, but intellectual activity as well, such as the creation of a new policy or plan of action. Coming from a policy perspective, Rittel and Webber (1973) refer to "wicked problems" as indeterminate problems that have no clear formulations and that have no right or wrong solutions, only better or worse ones. However, they differ from Simon in that they see all wicked problems as unique and that there can be no truly scientific approach since there is no science of the particular (Buchanan, 1992).

Design thinking is seen as the best approach to address ill-structured or wicked problems. Although there are variations, most forms of design thinking include empathy, abductive reasoning, framing, and progressive refinement. Empathy is central to design thinking. Solutions are designed specifically to improve the lives of the humans involved in some way (Leinonen & Durall-Gazulla, 2014). Consequently, a starting point to design thinking is to observe, engage and involve those who are connected to and affected by the problem.

Deductive and inductive reasoning are suited for problems that have clear, identifiable parameters and/or for problems that have solutions with relatively predictable outcomes. In contrast, abductive reasoning is used when there is incomplete information (Burdick & Willis, 2011; Cross, 2006; Dorst, 2011; Louridas, 1999) and when the *only* known component is a desired outcome. In order to begin the actual work of designing, the designer has to first frame the problem, which is to articulate the perspective from which the designer would tackle the problem. In other words, "IF we look at the problem situation from this viewpoint, and adopt the working principle associated with that position, THEN we will create the value we are striving for" (Dorst, 2011, p. 525, emphasis in text). Framing is also an important part of "problem setting." Schön (1984) writes:

> When we set the problem, we select what we will treat as 'things' of the situation, we set boundaries of our attention to it, and we impose upon it a coherence which allows us to say what is wrong and in what directions the situations need to be changed. Problem setting is a process in which, interactively, we *name* the things to which we will attend and *frame* the context in which we will attend to them (p. 40, emphasis in text).

Once the problem has a frame, the designer can start prototyping and testing solutions through a process of progressive refinement, which involves continuing improvement on designs to be tested in the real world (Collins et al., 2004).

Design thinking entered education and educational research both as a research methodology (Barab & Squire, 2004; Brown, A. L., 1992; The Design-Based Research Collective, 2003; Collins et al., 2004) and a pedagogical approach. Design thinking complements constructivist approaches to learning, where learning is also seen as unpredictable and altered by new insights (Sheer, Noweski, & Meinel, 2012). Schön (1992) refers to teaching and learning as a "design transaction," during which the student and teacher should learn from one another through reciprocal reflection by understanding how things are interpreted from one another's perspectives. He even cites games as an example of how players take on different perspectives by understanding the rationale behind the moves of other players (Schön, 1992). His emphasis on the importance of reflective practice (1984, 1987) has also been influential in education. By reflecting-in-action, the practitioner is able to gain metacognitive awareness and perceive his/her intuitions and biases, test hypotheses, and take on new perspectives. The approach of having students learn by designing their own games combines design thinking and game-based learning (Kafai, 1995, 2006; Li, Lemieuz, Vandermeiden, & Nathoo, 2013). Design thinking also supports new forms of literacies brought on by new media technologies as well as game-based learning. Burdick and Willis (2011) cite the Quest to Learn School as an example of design thinking and digital literacies coming together to support learning and abductive problem solving in students. Similarly, Carroll et al. (2010) bring design thinking to middle schools to help teachers and students develop design thinking mindsets and skills such as human-centeredness, empathy, metacognitive awareness, prototyping, and collaboration. Finally, curricula planning are examples of wicked problems (Rittel & Webber, 1973). Each class is unique, not only in terms of content, but also the specific students in them. Teaching and educational innovations are usually not evaluated in terms of right and wrong, but better or worse solutions to particular problems.

Having given an overview of design thinking and its contributions to education and games, I now describe the wicked problem I faced and the way I applied design thinking, through gamification, to improve upon the class. The focus on the design process is informed by Schön's (1984, 1987) description of reflection as a process of revealing doubt and designing solutions to address them.

The Wicked Problem

"Philosophy of Technology" was a graduate level course in our program in educational technology and had been a difficult course for students in terms of connection. The readings were dense, and the topics were typically abstract. Our students came from a variety of backgrounds. Many of them were preparing to be, or already were, working as K-12 teachers.

Others were instructional designers in institutions of higher education. They were competent students who did well and enjoyed the challenge posed by other courses in the program. However, the philosophy course was designed to ensure that students also develop skills in reading challenging texts and discussing complex and controversial topics. Students also had to produce formal, academic writing that draws on various philosophical perspectives to make reasoned arguments, comparisons, and syntheses. The challenging readings, topics, and formal writing assignments were not activities I wanted to lose, dilute, or trivialize through gamification.

The course was a blended course that alternated weekly between face-to-face and online meetings. Our institution used Moodle as its learning management system (LMS), which supported the use of badges. However, in earlier attempts to use it, I had found Moodle's implementation of badges to be onerous and not a viable solution to this particular problem. This turned out to be a positive development because it forced me to turn to other solutions. Ideally, the solution would also work within Moodle. Since I already share a Google Sheet with each student, on which students can see their grades and rubrics associated with the assignments (see Hung, 2017), I did not want to add yet another site by using a third-party application or readily gamified platform. At the same time, I did not want the technical constraints and infrastructure to over-determine the basis of the solution.

Method

Different design studies present the procedures for design thinking in different ways, but they generally build on the fundamentals—empathy, abductive reasoning, framing, and progressive refinement—described above. I use the methods suggested by Stanford University's Institute of Design (n.d.) here for their straightforwardness. Their framework involves:

- Empathize: Focus on human-centered approach to design by observing, engaging, and understanding those who will be impacted
- Define: Frame the problem based on the observations collected and develop a point of view from which to approach the problem
- Ideate: Develop the design plan by "going wide" and using techniques such as mind-mapping, sketching and other methods of brainstorming
- Prototype: Start with a rough plan, storyboard, or sketch and start building
- Test: Test the design in the real world, and refine it over time

These steps are intended as guidelines, and not a strictly prescribed process.

Empathize and Define

In my case, the need to empathize with students was precisely the problem that needed to be resolved, so it makes sense to see them as the same step in the process. Since the class only had seven students, it provided an opportunity to start small and come up with solutions that can be sustainable and scalable to larger classes. I started first by talking to, and consulting with, instructors who have taught similar courses, including looking at how they structured their courses. I also accounted for the feedback that former and current students gave me from formal course evaluations and informal exchanges. Students were given a way to send me anonymous feedback while a course is in progress through polls and questionnaires distributed throughout the semester. Collectively, this was used as the basis for understanding students' needs and expectations and the starting point of where to start bridging their needs with the academic requirements and desired outcomes for the course.

Ideate

The next step was to brainstorm how the course should be improved. This involved generating a long list of desired outcomes. The process I used was to simply type down as fast as I could the ideas as came to me, without stopping until I was out of ideas. After the list was complete, I looked for patterns that emerged and color-coded them accordingly, noting points of overlap. Figure 1 shows the outcome of the process. What became clear was that the two areas that are the most common targets for gamification – showing up on time (attendance) and posting things on time – were no longer a high priority.

My teaching strategies already contain varying degrees of gamification. These include giving students choice in their assignment (when possible), giving them freedom to fail by letting them re-submit assignments an indefinite number of times until the end of the semester, and using a progress bar to display their growth over time (Hung, 2017; Dicheva, Dichev, Agre, & Angelova, 2015; Sheldon, 2011). The design I wanted to create was in addition to these strategies. Consequently, I also wanted to avoid over-complicating the course by adding too many layers to it. In my experience, students tend to spend less time on the LMS than I expect, so gamification works best if it is simple to figure out. This called for a visual solution. While I liked the visual appeal of the progress bar and the competitive element of a leaderboard, I wanted to avoid students feeling that their performances and failures were on public display. While public displays of competition may appeal to some students, others find it less motivational (Domínguez et al., 2013). The solution was to give all students a pseudonym that only

Figure 1
Desires outcomes for Philosophy of Technology

- Improve students' willingness to ask questions about a text (to admit there are things they don't understand)
- Improve students' willingness to make connections with other things (other texts, their lives, society, students, etc.)
- Encourage students to make intertextual connections (similar to point above)
- Encourage students to see patterns/trends/big ideas in what philosophers are talking about
- Encourage students to look up words and concepts that they don't understand and share it with the class
- Encourage students to see importance of understanding technology in its broader historical context
- Have students understand key terms in philosophy (e.g., techne, episteme, panopticon) (not just understand but to use them correctly)
- Have students understand different perspectives in philosophy (e.g. feminism, Marxism) (not just understand but to use them correctly)
- Have students identify the philosophical positions presented about technology in fictional depictions
- Encourage students to take risks in their interpretation of texts
- Encourage students to conceive their own philosophical positions
- Encourage students to be able to do deep reading of challenging texts (too vague?)
- Appreciate the role of philosophy as a discipline
- Motivate students to deconstruct texts in terms of their structure and rhetorical style
- Have students understand how to structure an argument in an essay
- Have students understand how to structure a compare/contrast paper in an essay
- Have students support one another in interpreting texts
- Have students challenge one another in interpreting texts
- Have students build a learning community (too vague?)
- Have students make connections between readings to technology
- Have students make connections between class discussions to technology
- Have students learn how to properly critique a text
- Have students formulate proper reactions to readings
- Have students show up on time (is this something to gamify?)
- Have students post things on time (is this something to gamify?)
- Get students interested in talking about big ideas

Patterns
- Encourage students to engage in self-guided learning
- Encourage students to think and share ideas as a community
- Encourage students to make connections
- Encourage students to "become" philosophers or to think like philosophers; appreciate the purpose of philosophy

they and I would know. They were free to share it with one another if they wanted, but the publicity was not to be imposed upon them.

Prototype

The list generated from the brainstorming (Figure 1) served as the blueprint for the gamification design. The next step was to translate this into a set of variables that could be represented visually as a progress bar and/or leaderboard in some form. Google Sheets was the platform used to design the underlying mechanics, collect the data using Google Forms, and display the leaderboard as a live chart.

The prototyping proved to be the most difficult step because it involved transforming a series of qualitative criteria into a coherent system that could be quantified and measured. Like all wicked problems, the prototypes changed as I experimented with different features of Google Sheets. In total, the prototype went through eight iterations before finally arriving at a version that could be used for the course.

Table 1 summarizes the major developments in the iterations. The design itself is not original. The gamified system is made up of a set of categories and sub-categories that represent different student achievements, actions, and observations.

The main categories and sub-categories were described to the students, but the weights (Table 2) and how they were calculated were not. This was to avoid attempts to "game the system" by focusing only on what had the largest effect. This approach to gamification is more cumbersome and less exact than using countable, discrete elements. However, it had an unplanned, but desirable, outcome: it made me more aware of my classroom as a learning environment. Because I was more consciously monitoring for these achievements, I became more self-aware as an instructor as a result.

Results

The iterations described in Table 1 were tested with hypothetical students because the course had not yet started. By the time it began, the prototype was in a workable and reasonably sustainable condition. The students were introduced to the gamification and were told they were allowed to ignore it if gamification was not their preferred way of learning. A chart that was able to refresh data live was embedded into a website and linked as an external website from Moodle. It would have been better if the chart could be embedded directly into Moodle, but I had trouble getting the chart to update the data live at the time. Also 0n the external website was the list and description of the main categories and sub-categories.

Table 2
Weights of Main Categories and Sub-categories of Achievements

Main Categories		Sub-categories	
Self-guided Learning	25%	Looking up words/concepts	25%
		Taking risks in interpretation	25%
		Expressing uncertainty or ignorance	25%
		Going to additional sources	25%
		Total	100%
Connecting Ideas	20%	Connecting with technology	20%
		Connecting with self	20%
		Connecting with society	20%
		Connecting with texts	20%
		Connecting with history	20%
		Total	100%
Community Building	20%	Sharing ideas	20%
		Asking questions	20%
		Supporting classmates	20%
		Attendance and punctuality	20%
		Total	100%
Historical Thinking	15%	Understanding history of technologies	10%
		Understanding evolution of ideas	20%
		Understanding historical context	35%
		Connecting with history	35%
		Total	100%
Philosophical Thinking	20%	Understanding key ideas	15%
		Understanding perspectives	35%
		Connecting with texts	25%
		Identifying fallacies	15%
		Making meaningful critiques	10%
		Total	100%
Total	100%		

Table 1
Iterative Step in Design Thinking

Iteration	Major Developments	Notes
1	Played with major categories and sub-categories of achievements	Major categories and sub-categories draw on the major patterns that emerged from the brainstorming. I started with: *Rhetoric*, *Technology Pathway*, *Community*, *Class Participation*, and *Moodle Participation* as the main categories, each of which contained sub-categories. These will continue to be adjusted throughout the iterations. Note the initial emphasis on conventional targets for gamification such as participation.
2	Added "Dashboard" to centralize control and improve usability	The Dashboard is the main spreadsheet where I can test the balance and inter-relationships between the categories and sub-categories.
3	Played with "quests" as a concept	Quests were considered as a possible way to frame the leaderboard and what the students could compete for.
	Added adjusted averages as a mechanic	The adjusted average was added so that all the categories can be presented as a percentage instead of a raw number. This was done to improve how the categories could be compared and visualized.
4	Abandoned quest concept	The "quest" concept did not lead anywhere.
5	Revised categories	The major categories and sub-categories were revised again. Prior to this revision, some of the categories were still over-reliant on conventional, academic categories and did not draw enough on brainstormed themes. The revised categories were: *Self-guided Learning*, *Connecting Ideas*, *Community Building*, *Historical Thinking* and *Becoming a Philosopher.*
6	Started testing how data will be collected with Google Form and parsed in the spreadsheet	Testing began on the best way to collect information through Google Form and how that data would be analyzed on the spreadsheet. The plan was to create a form that I would use each time a student did something that I valued and wanted to acknowledge.
	Added additional competitive mechanic	An additional, competitive mechanic was added to change the way the scoring worked. Their scores were now calculated in relation to one another.
7-8	Improved ease of use	The form, spreadsheet, categories and visualization were finalized.
	Finalized categories	
	Cleaned up interface	

After the end of the first class, the students were emailed their pseudonyms. The students were told that the leaderboard would not be a direct reflection of their grades. Their academic writing, made up of three short papers and one extended paper, contributed to the largest portion of their final grades. While these papers also contributed to their leaderboard scores, most of the scores came from discussions in class and on Moodle, as well as more informal conversations held on a class-specific Slack channel, an instant messaging tool that allows for file-sharing and other application integrations. Each time I registered an instance of an achievement, for example, when I noticed a student taking risks or admitting having difficulties interpreting a reading, I used a Google Form to update the spreadsheet and leaderboard.

Figure 2 shows what the leaderboard looked like at the end of the semester. This was the student's view, which only displayed the main categories. Regardless of whether the leaderboard had any effect on the students, it became a useful diagnostic tool for myself to know my

own class, my students and the learning environment better. While it was somewhat cumbersome, it was not disruptively so, especially when compared to prior attempts at using badges on Moodle.

For me, the leaderboard communicated the strengths and weaknesses of each student more clearly. The discrepancies between the higher-ranked students (Cicero and Nietzsche) and the others can be explained by some of them being more active on Slack. All students in our program were asked to join Slack, and many already had accounts through their work. My class had its own channel as a third space for them to interact more informally and spontaneously. The channel became a vibrant place for conversation, such as when people shared links to news articles that related to topics from the class. Since the channel was open, other instructors and students were also able to join in the conversations. These conversations would not have been factored into their formal grades, but they could be acknowledged on the leaderboard. The students who had the lowest leaderboard scores were less active there.

Figure 3 shows an expanded view of the leaderboard that was not shared with the students. This was, in part, because it was a bit confusing and overwhelming to look at. Although I seldom looked at this myself, it did provide a way to take a deeper look at how the class was going, especially at the end of the course when I wanted to reflect on how the class went.

Discussion

The process of using design thinking with gamification provided me an opportunity to be a more reflective instructor during the design process, as well as during its implementation. It gave me insights into my own teaching, raising questions such as: Who was dominating the class? Who was I noticing more? Was I noticing or acknowledging one student too much or too little? In the remainder of this article, I argue that gamification and design thinking should be used together, and that gamification researchers can contribute to design research by making their gamification design process more explicit in order for all of us as a research community to learn.

Gamification and Design Thinking as Instructional Design

The main purpose of using gamification for this class was to improve on a class that many students have found challenging. Design thinking was used because it treats instructional design as a wicked problem (Buchanan, 2001; Rittel & Webber, 1973) with no right or wrong answers, only better or worse ones. A simple answer, such as making the readings and topics easier or lowering expectations would have been easier, but that would be to misidentify the problem. If learning by design is a good way to improve learning among students (Brown, A. L., 1992; Carroll et al., 2010; Kafai, 1995, 2006), then it should be a good way for us as instructors, instructional designers, and researchers to learn as well.

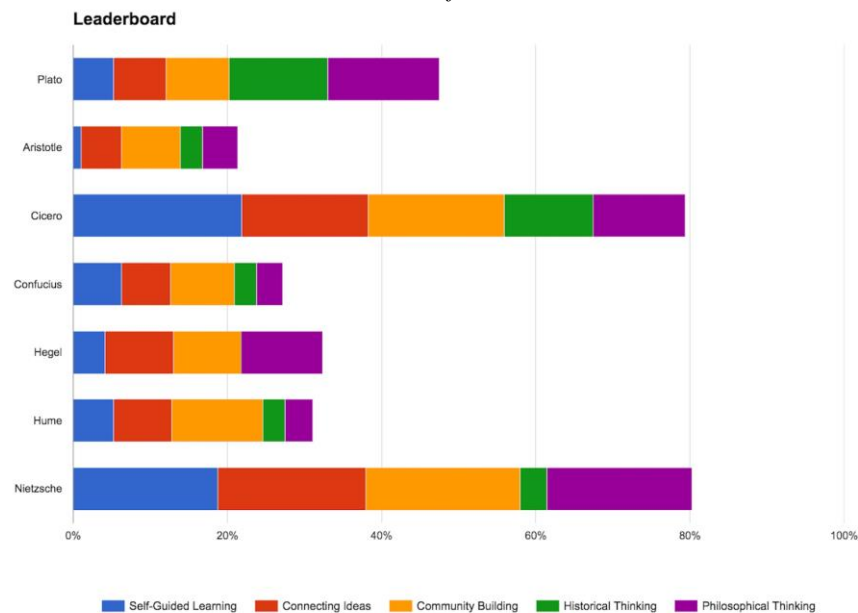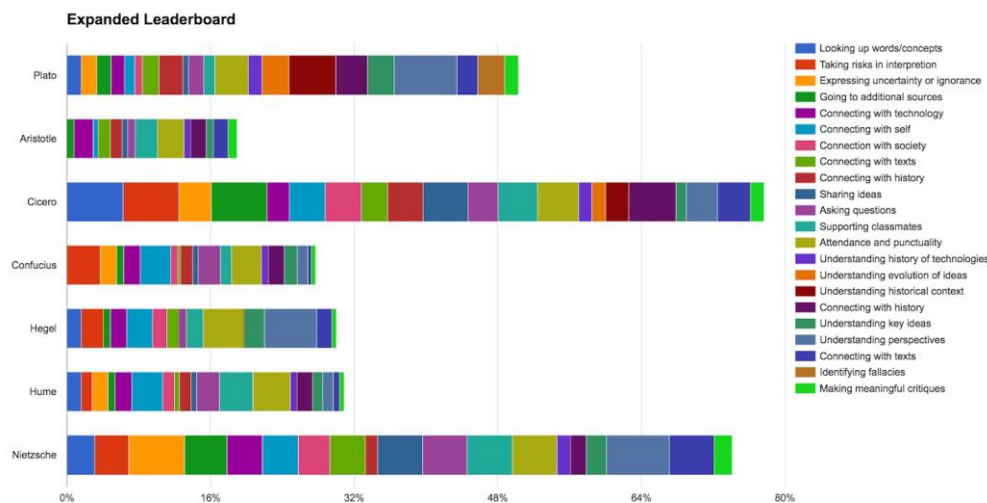Figure 2
Student view of leaderboard

Figure 3
Expanded leaderboard view

It is likely that the effects of gamification cannot easily be measured satisfactorily through surveys of motivation, engagement, attendance, or grades because there are too many variables that could affect how students respond. Critics of gamification argue that it over-simplifies complex problems (Bogost, 2015; Robertson, 2010). However, both gamification and design thinking are approaches to problem-solving. With design thinking, gamification may be used in more meaningful ways because design thinking offers a different lens through which to conceptualize the problem.

Based on my reflections, as well as student assessments, the philosophy course went well, and the feedback was positive. (As a course that used to be the most dreaded course of the program, I considered this a move in the right direction!) The students enjoyed interacting with one another, and their strong "Community Building" leaderboard scores reflect that. However, I do not believe gamification alone improved the class; it was gamification and design thinking together. Since design thinking insists on the designer start with empathy, gamification was designed around the students and not around Moodle or a third-party application. This is not to suggest that technological concerns are not important, but it is to argue that technology should not be the starting point of the design. Learning, motivation, and engagement are about humans, not technologies.

Gamification may or may not have improved my students' experience directly. However, the design process did help me re-conceptualize the course and focus on different details. Design thinking also made what was abstract temporarily concrete. The patterns that emerged

from the brainstorming (Figure 1) became the key categories and sub-categories for the achievements through the iterations (Table 1), which further solidified into numerical values (Table 2). Those values may seem arbitrary, but all game mechanics are arbitrary to some extent. They only lose their arbitrariness after the prototype has a chance to go through more tests and re-designs. Being able to visualize the students in their leaderboards also likely benefited me more than the students because it made me more conscious of the learning environment and the interactions within it. It made it easier to visualize what was or was not going well, and for whom. This not only helped me be more reflective, but it also provided the foundation for the next prototype.

Designing in the Open

This particular gamification design is clearly not going to work for much larger classes, and it was not intended to be a universal prototype. It was designed for this particular class in mind. As a community of researchers, we can learn more from one another if we made our design process more transparent, either through design thinking or through any other method that shows how the gamified curriculum came to be the way it is. Some questions that those interested in using gamification in education need to address are:

- What was the problem the design was trying to solve?
- Why did you choose to use a particular mechanic or set of mechanics?
- How did the design evolve?

- What was the rationale behind assigning those particular values to those particular mechanics?
- When and why did you change your mind?
- What does your design tell you about your teaching style?
- Where does the input for the gamified system come from and how accurately does it reflect what you are trying to capture in your design?

Designing in the open is uncomfortable because it exposes the entire system to scrutiny and criticism. However, I would argue it is more akin to the open source movement, except what is shared is not software code, but rather the design thinking process. While the finished product is interesting to talk about, the process that went into its design is arguably more important. This is almost never a focus in gamification research.

Conclusion

This article describes how design thinking and gamification were used to address the wicked problem of re-designing a graduate course in philosophy and technology. The goal is not to advocate for a specific approach to gamification, or even gamification in general. Instead, it is to show the rationale and procedures taken to arrive at the particular design. I argued that design thinking and its focus on empathy is a good way to improve gamification because it puts the users at the center, not the technology, LMS or game mechanic. I encourage gamification designers to share their design processes more openly in order for all of us to learn and understand their design decisions. Finally, I suggest that, while gamification may not impact students directly, it can help instructors improve their instructional design, especially if used with design thinking, and this, in turn, will be a benefit to the students.

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Teaching and Learning about Interprofessional Collaboration Through Student-Designed Case Study and Analysis

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Learning activities to develop interprofessional collaboration align with goals for professional preparation to improve health outcomes. A problem-based case study approach can offer formal and informal learning interactions that promote information exchange and collaborative practice. The purpose of this instructional article was to describe a five-stage student-designed case study and analysis activity to accomplish student learning outcomes for developing knowledge and skills in evidence-based case analysis through interprofessional collaboration. Four main learning outcomes included gaining knowledge of other professions, planning and reviewing care interventions, evaluating outcomes of other practitioners, and facilitating inter-professional case conferences and team working. An example case scenario and lessons learned are presented. This paper offers key learning points for educators and students related to the literature in problem-based learning and interprofessional education. The results confirm the feasibility of student-designed case studies as a problem-based experiential learning activity. Potential benefits for students include increased knowledge of, and appreciation for, other disciplines gained through practicing and reflecting on peer feedback. Information exchange between the students allowed interprofessional learning to occur. Students from different disciplines collaborated in the development of strategies for planning, implementing, monitoring, and evaluating a health program.

The World Health Organization advocates for interprofessional education (IPE) that occurs "when students from two or more professions learn about, from, and with each other to enable effective collaborative practice and improve health outcomes" (WHO, 2010). In 2011, the Interprofessional Collaborative Practice (IPEC) panel report proposed interactive learning and competencies for health students from different disciplines to prepare for "deliberatively working together" to improve community and population health systems (IPEC, 2011). Interprofessional collaboration was defined in the Canadian Interprofessional Health Collaborative (CIHC) national competency recommendations as "[a] partnership between a team of health providers and a client in a participatory, collaborative and coordinated approach to shared decision-making around health and social issues" (CIHC, 2010). In 2016, the IPEC panel of experts expanded from 6 to 15 professional organizations. Their updated guidelines placed interprofessional collaboration as a central domain in IPE (IPEC, 2016). This signified a growing priority for educators in health professions to develop formal and informal learning activities that advance students' abilities with interprofessional collaboration (CIHC, 2010; Gambescia, 2017; IOM, 2013; WHO, 2010;). Related to these national efforts, the Global Forum on Innovation in Health Professional Education requested that an Institute of Medicine (IOM) consensus committee examine the evidence on the impact of IPE. This IOM committee proposed that knowledge and skills with interprofessional collaboration occur during prelicensure and graduate education in professional programs. Their report included a framework wherein development of these collaborative competencies happens while students develop profession-specific skills rather than outside the standard curriculum (IOM, 2015). Collectively, these organizations described the relevance and timing of IPE for improving health systems.

Guidelines for the development of teaching and learning activities to integrate IPE into professional education can be drawn from the literature on the socio-cultural learning theory, competency-based learning, and problem-based learning. The socio-cultural learning theory, within the context of constructivist approaches introduced by Vygotsky, has been applied in the field of medical education among others (Nalliah & Idris, 2014; Salomon & Perkins, 1998). It highlights the important influence of students working together and learning from each other to reach the next area of potential development (e.g., active experimentation, scaffolding, the Zone of Proximal Development) (Chaiklin 2003; Nalliah & Idris, 2014; Vgotsky, 1978). As others have identified, the constructivist framework can lend itself to IPE as an interactive and socialization process (Casmiro, MacDonal, Thompson, & Stodel, 2009; Olenick, Allen, & Smego, 2010).

Barr's model for competency-based interprofessional education described key abilities relevant to various stages on the learning continuum (Barr, 1998). These include: (1) recognize and respect the roles of other professionals, (2) jointly plan and review care interventions, (3) evaluate the outcomes of another practitioner's work, and (4) facilitate interprofessional case conferences and teamwork. Olenick and colleagues (2010) conducted a concept analysis of IPE and noted that the processes conducive to interprofessional

learning included problem-solving and critical thinking. The interprofessional learning continuum model, designed to guide assessment of IPE from education-to-practice, included collaborative behavior, as well as knowledge and skills, attitudes, and perceptions of other professionals as learning outcomes (Hammick, Freeth, Copperman & Goodsman, 2009; IOM, 2015). Within the list of learning methods for IPE, exchange-based learning, such as case studies, allowed students to compare views and experiences (Barr, 2002).

Problem-based learning (PBL) as an instructional approach permits students to activate their existing knowledge and present arguments on solving multifaceted problems in a wide variety of fields to gain a stronger understanding of the scientific process (Loyens, Jones, Mikkers & Van Gog, 2015). In addition, Dolmans and collegeaus described PBL as "a student-centered approach in which problems are the stimulus for learning. It is characterized by: (1) learning through problems, (2) small group sessions, (3) group learning facilitated by a teacher, and (4) learning through self-study" (Dolmans, Michaelsen, Van merrienboer, & van der Vleuten, 2015, p. 355,).

The work of Engeström and Sennino (2010) described how students gain mastery toward an objective with the aid of a mediating tool. For the IPE project reported here, the object to be achieved was collaborative practice through a mediating step of case design. By asking students to concentrate on case design, we considered that the scope of learning could include a focus on the process of learning. In other words, by collaborating on case design, students would consider the impact of the collaborative process, as well as the results of fact-finding and problem-solving, thereby, drawing from the socio-constructivist perspective by which "learners create meaning from experience through interactions with other learners and with their learning environment" (Casmiro et al., 2009, p. 396). Also, this process seemed true to the "with, from and about" definition of IPE in socio-cultural learning is key to an understanding of interprofessional learning (Freeth, Hammick, Koppel, Reeves, & Barr, 2002).

The purpose of the IPE learning activity described in this article was to apply a problem-based case study approach to promote collaborative practice and information exchange between students of varying disciplines. In this instructional article we described the development and implementation of this learning activity with an example student-designed case scenario. The resulting learning outcomes were identified through informal discussions with students. Evidence from the literature was considered with the "lessons learned" from this effort to help students become practice-ready to problem-solve and research complex problems in collaboration with other professions.

Method

To ensure that the case study learning activity provided a platform for students from different disciplines to recognize different perspectives through interaction and collaboration, key aims were identified, the setting was selected, and course development and implementation followed. To meet the primary aim for interprofessional collaboration, students from different disciplinary backgrounds worked together in the design of a case scenario. Through their combined efforts, a case scenario that exemplified a complex problem and multiple perspectives would be incorporated in the content of the case itself. The premise of this step was that students could benefit more if tasked with collaborating to design a unique case scenario that reflected problem(s) within their own fields than they would if assigned a case scenario.

In addition, this IPE learning process was intended to meet students' own professional competencies, as well as inter-professional collaborative practice, through shared discovery of an empirical and theoretical basis for case analysis. Thus, knowledge translation became a secondary, and complementary, aim of this learning activity. Knowledge translation was selected because it had the potential to offer students a near-authentic opportunity to develop experience with case-based problem-solving (Bhogal et al., 2011). As defined by Graham and colleagues (2006), through the process of knowledge translation students can identify gaps between desired and actual care, identify needed practice changes; and evaluate outcomes, causes, and solutions.

The setting for this innovative student-designed case activity was an inter-professional health sciences doctoral program at a large university in the Midwestern U.S.A. The doctoral program, housed in the College of Health and Human Sciences at Northern Illinois University (NIU), offers full- and part-time program options for place-bound students through blended course delivery. In the NIU program, course planning faculty envisioned the term "inter-professional" as ascribed to Hall and Weaver (2001). The NIU doctoral program promotes individuals from different disciplines working and communicating with each other. It encompasses an inter-professional learning environment in which each member provides his/her knowledge, skills, and attitudes to augment and support the contributions of others.

Most students in this program seek a research-based terminal degree to advance in academia or as principle investigators for a health agency, professional organization, or academic medical center. This instructional activity was implemented to meet program goals in a class of seven students: three males and four females. The students participating in this course were working adults of varied educational backgrounds and

Figure 1
Criteria for case study peer review

Peer review is a key step in the development of each final written case study and analysis report. Consider these criteria as you prepare your presentation. Audience members will use a three-point rating scale for each criteria (met, partially met, and not met), and add constructive comments for your consideration.

Critique criteria

1. Case Description: Clearly identified and demonstrated a sophisticated understanding of the main issues/problems exemplified in the case study

2. Case Content: Case incidents and details interesting and realistically portrayed

3. Stakeholder Perspectives: Described unique perspectives of multiple key stakeholders in the case including tensions or conflicts of interest

4. Context and Conceptual Background: Clearly situated with the appropriate details

5. Analysis and Evaluation of Issues/Problems: Balanced, in-depth, and critical assessment of the facts of the case in light of relevant empirical and theoretical research; insightful collaborative conclusions

6. Case Recommendations: Supported primary objectives with strong arguments and well-documented evidence; recommendations reasonable and objective

7. Links to Course Readings and Additional Research: Excellent research into the problem, clear links to the material covered in class and more

work experiences that included an associate director for rural health professions, a biology instructor, a chiropractor, a clinical research coordinator, an epidemiologist, a medical laboratory scientist, and a public health advisor.

Course Development

We began with the end in mind in the manner of backward design (Wiggins & McTighe, 2005). From a review of curricular resources in the public domain and related literature, we highlighted the knowledge and skills for interprofessional collaboration and evidence-based case analysis. For this activity we determined the main learning outcomes to be that students would be able to:

- Collaborate to design a case scenario of an overarching research problem
- Evaluate current solutions through teamwork with people in other professional roles
- Disseminate results of an evidence-based case analysis through oral and written presentations
- Engage classmates in discussion about an overarching problem and adequacy of the evidence

- Critique case presentations in a respectful manner with an interprofessional focus

To devise evaluation criteria applicable across disciplines, we reviewed rubrics such as those from the Association for the Assessment of Learning in Higher Education. We selected a three-point rating scale, with descriptors for "met," "partially met," and "not met" status to offer discrete categories for peer review. The case study review criteria were drawn from examples in the public domain (see Figure 1). Lastly, we developed the learning experiences, written directions, and corresponding forms for the case study assignment that resulted in a five-stage process.

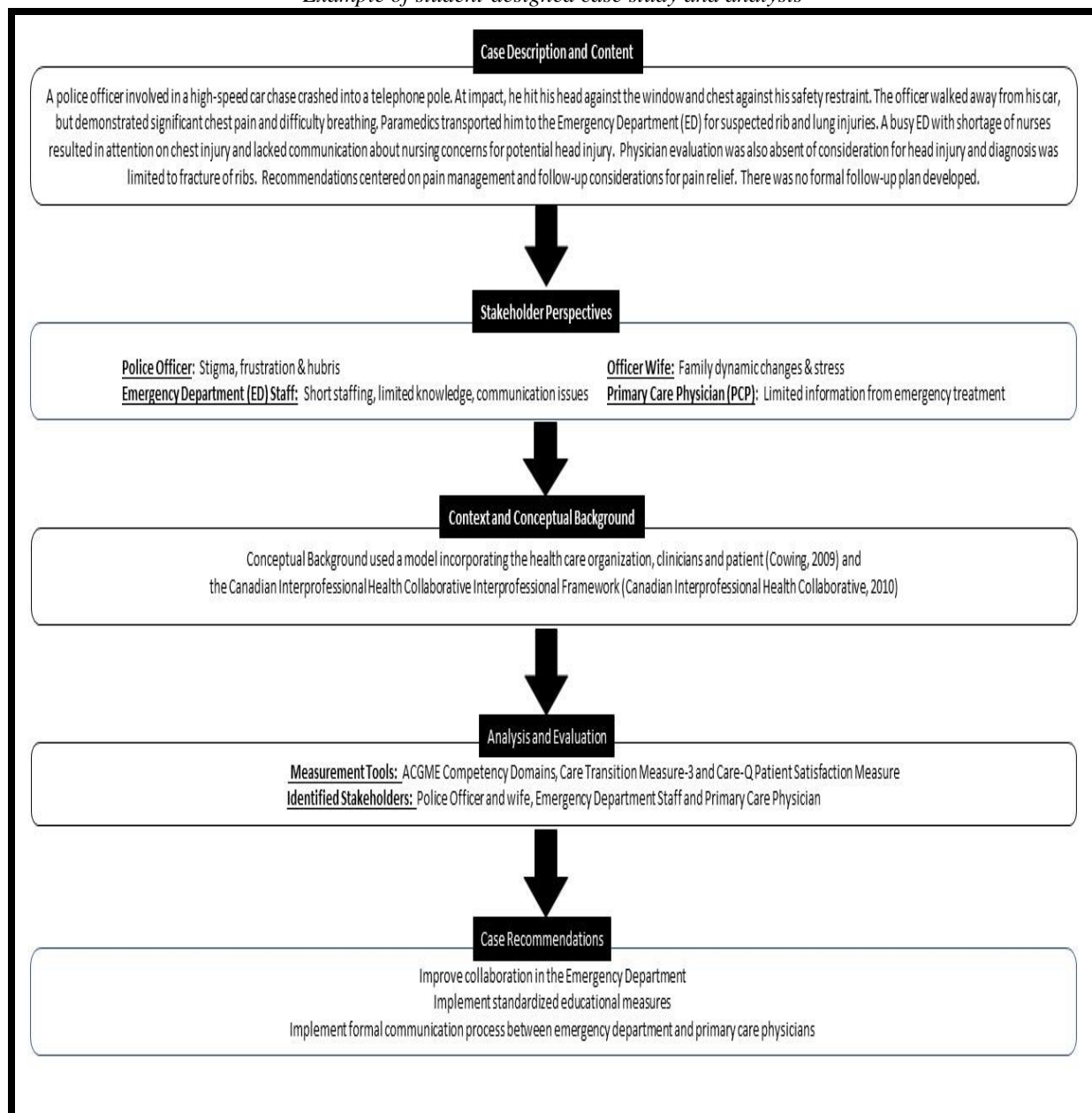**Implementation**

The IPE activity was delivered through an online platform for information sharing, discussions, presentations, and feedback. Students in the class were encouraged to share their disciplinary perspectives, literature sources, health measurement tools, and outcomes through collegial exchange.

Stage one: Group case discussion. Students reviewed a presentation about the purpose, scope, and evaluation of case studies through an audio-recorded module. They also participated in analysis of a case study based on the article, "Managing Everyday Ethics in Assisted Living" (Messikomer & Cirka, 2008). The template for this activity served as the format for the final case study design project. The goal of this stage was to provide students with the opportunity to practice case analysis of a healthcare issue related to aging adults. This activity encompassed a shared interest for multiple disciplines and levels of experience.

Students were instructed to write a short case analysis and post this in the online classroom discussion section responding to the following questions: (1) What immediate steps should the executive director take to manage the situation? (2) What actions or policy changes are needed over the long term? (3) What health measurements could be used to achieve goals related to these issues, such as public resources Vital Signs, Human Development Index, and Health Outcomes Core Health Outcomes Library? and (4) Provide a case

Figure 2
Example of student-designed case study and analysis

Case Description and Content

A police officer involved in a high-speed car chase crashed into a telephone pole. At impact, he hit his head against the window and chest against his safety restraint. The officer walked away from his car, but demonstrated significant chest pain and difficulty breathing. Paramedics transported him to the Emergency Department (ED) for suspected rib and lung injuries. A busy ED with shortage of nurses resulted in attention on chest injury and lacked communication about nursing concerns for potential head injury. Physician evaluation was also absent of consideration for head injury and diagnosis was limited to fracture of ribs. Recommendations centered on pain management and follow-up considerations for pain relief. There was no formal follow-up plan developed.

Stakeholder Perspectives

Police Officer: Stigma, frustration & hubris
Emergency Department (ED) Staff: Short staffing, limited knowledge, communication issues
Officer Wife: Family dynamic changes & stress
Primary Care Physician (PCP): Limited information from emergency treatment

Context and Conceptual Background

Conceptual Background used a model incorporating the health care organization, clinicians and patient (Cowing, 2009) and the Canadian Interprofessional Health Collaborative Interprofessional Framework (Canadian Interprofessional Health Collaborative, 2010)

Analysis and Evaluation

Measurement Tools: ACGME Competency Domains, Care Transition Measure-3 and Care-Q Patient Satisfaction Measure
Identified Stakeholders: Police Officer and wife, Emergency Department Staff and Primary Care Physician

Case Recommendations

Improve collaboration in the Emergency Department
Implement standardized educational measures
Implement formal communication process between emergency department and primary care physicians

synopsis with your recommendations and how they reflect an interprofessional focus. Students engaged in dialogue about the case from different disciplinary perspectives through the online discussion forum. Faculty provided feedback using the same rubric and criteria that would be used for the final project in order to allow students to become familiar with the case study process. This activity allowed students to observe how their classmates with different backgrounds in health approached a uniform case.

Stage two: Inter-professional collaboration in case analysis. In the following week, students practiced inter-professional collaboration to improve health care systems through case study review in partnership with a classmate from a different discipline. Students chose a case study from the Institute for Healthcare Improvement (IHI) and took the role of leader/champion for IPE and collaborative practice. The case studies provided opportunities to improve care across a continuum of health issues ranging from extended care to confidentiality to international issues of health care systems. The students identified the key coordinating elements required to address this case. They also provided rationale for an interprofessional approach to addressing real world issues in the delivery of quality health care. Through interprofessional collaboration, each group came to a consensus about key elements and solutions identified for the case they chose to analyze.

Stage three: Case study design. In this stage, students were tasked with designing a case scenario to exemplify overarching problem(s) in a health or community setting through collaboration with one or more individuals from different disciplines. Students matched up themselves into small groups. Each small group developed a case-based analysis including a comprehensive description of the context, significant issues for different disciplines, stakeholder perspectives, and credible measurements. In addition, the context of the case incorporated current industry standards and regulations, as well as relevant individual, familial, organizational, and societal issues. Regardless of the group size, the students were required to consider at least three different stakeholder perspectives in their case analysis. Finally, each small group provided empirically-based recommendations for problem solving with targeted solutions and evaluation. As an example, one pair of students combined their research interests in law enforcement and concussion-related injuries in the design of their case study (see Figure 2).

Stage four: Case presentation and review. Student groups presented their case studies using a PowerPoint™ format in a synchronous web-based platform. Each of the other students was asked to critique their peer's presentation in a constructive manner using the Case Study Analysis Criteria for Peer Review (see Figure 1). This allowed the student groups to experience feedback from their peers, who often represented other disciplines. This exercise aimed to reinforce the concepts that interprofessional work is a collaborative effort and that interaction across different professional cultures and languages results in the construction of common ground (Klein, 2014). The two faculty members also provided feedback.

Stage five: Written case study. To meet student learning outcomes, student groups reflected on their case presentation and utilized feedback to revise their case study and analysis to develop a final written case study for faculty review and grading. At this stage, faculty primarily assessed how well student groups incorporated feedback from the instructors and peers to enhance their overall case study and analysis. Table 1 provides information from the example case with peer-review comments and application to the final written case study.

Results

Completion of the student-designed case study activity provided students with an opportunity to examine several facets of IPE with realistic problem solving. The results of this learning activity are presented in the framework from Barr's model of key competencies for IPE (Barr, 1998). These findings were summarized from comments from students in the class, the review by the two co-facilitators, and the example student-designed case (Figure 2).

Recognize and Respect the Roles of Other Professions

Working closely with others from disciplines outside of their own allowed students to learn more about problems that spanned multiple fields and occupations. In the example case, students with backgrounds in kinesiology and speech language pathology discovered a shared interest in the awareness of diagnosis, treatment, and recovery from concussion. Though this topic exists as a health promotion priority, examining a case from different perspectives helped illustrate the wide scope of underlying issues within one case scenario. The students additionally identified concerns crossing several disciplines that included health care professionals, members of administration within the law enforcement community, and human resource representatives in order to meet the medical and employment concerns of the patient and his wife. Issues that surfaced included interpersonal communication and the individual mental or psychological beliefs regarding concussion as a traumatic brain injury. The education that occurred with the law enforcement personnel led to an internal policy review and additional training for officers. Students

Table 1
Select Feedback and Group Response on the Example Case and Analysis

Review Criteria	Self-assessment of 1st Case Presentation: Oral	Peer-Review Feedback	Student Use of Feedback for Case Presentation: Final Paper
Identify Problem and Underlying Issues	• Presented problematic issues from ED staff, PCP and patient perspective	• Clear, realistic description of case • Difficult to keep track of stakeholders • Need more focus on conceptual background	• Maintained realism of case • Expanded focus to organizational infrastructure and leadership issues • Elaborated on conceptual framework
Inference of Data for Decision-making	• Evidence related to healthcare only	• Clear, empirical supporting evidence • Need more examples of proposed solutions from the literature	• Expanded solutions to utilize communication methods from aviation and the Navy
Use of Health Measurements to Achieve Goals	• Proposed follow-up 48 hours after discharge from ED • Focused measurement on staff level communication and hand-off issues	• Need recommendations and evidence to be more integrated • Need to apply current models and trainings to case • Consider care pathway in ED instead of follow-up 48 hours after visit • Consider culture changes rather than individual changes	• Incorporated additional training and expanded explanations of models • Modified recommendation from follow-up to care pathway development • Focused development of solutions at the organizational/leadership level and staff level
Interprofessional Focus of Case Analysis	• Case spanned 3 different settings: emergency department, primary care and word setting	• Great diversity of stakeholders • Consider expanding individual patient view of interprofessional care • Appreciated conclusions targeting several disciplines	• Expanded the interprofessional focus through creation of working group comprised of organizational leadership, staff and PCP representatives

reported understanding the differences between multiple disciplinary perspectives more clearly, even though those differences may be nuanced and not explicit. They emphasized the importance of respectful communication and environments that valued collaboration.

Jointly Plan and Review Care Interventions

Many over-arching problems facing society today compel investigators to examine data from multiple disciplines to make effective decisions. In this project, the shared process of examining scholarly literature

exposed students to new types and sources of data, including theoretical and empirical research. This provided students with a different foundation to draw upon when developing recommendations for their analysis. As such, collaborative practice may assist with reviewing care processes. For instance, in the example case students identified potential benefits from improving communication through standardized reporting mechanisms. A lack of structured communication strategies could have cumulative effects on professionals outside of their immediate setting and impact outcomes. The case analysis included planning

to enhance communication by outlining action steps based on literature and existing practices.

Evaluate the Outcomes of Another Practitioner's Work

Commonly, a first step was to develop consensus on the focus of their desired outcomes and measurement goals. In the example case, the students prioritized four domains in the case for measurement: inter-professional collaboration, communication, transition in care, and patient satisfaction. They selected assessment tools for each domain noting explanations and critique of these choices in their case presentation and final written report. The list of evaluation measures students proposed reflected a wider range of tools than expected from a narrower scope of discussion. During the presentation, other student colleagues shared their own findings from the review of the literature from different professions.

Facilitation of Inter-professional Case Conferences and Team-working

During case development the students incorporated perspectives from different disciplines by describing the actions of several individuals in the case. One benefit from working in small groups to create this case analysis was the combining of perspectives and experiences to describe a multitude of stakeholders in the case, as well as the possibilities for inter-professional collaboration within the care plan. Blending their knowledge and experiences opened the door to identifying potential shortcomings or strengths of treatment approaches illustrated in the case. In the example case, students applied their knowledge gains about inter-professional approaches to health promotion and exemplified the need for collaboration between professionals from diverse fields to solve complex problems. Though this case highlighted health care provided to a single person, the students also realized health promotion efforts using interprofessional approaches might show significant benefits with broader impact.

Lessons Learned

Through this activity, student experiences can be tied to the literature of teaching and learning.

Use case study design to promote inter-professional interaction in a new way. For this project, the object achieved was collaborative practice through a mediating step of case design. We raised the level of expectations by requiring that students work in small groups to design a case for the primary goal of gaining knowledge of other disciplines, communication skills, and appreciation for interprofessional collaboration.

Reeves and colleagues suggested that scheduling time for interaction was a responsibility of the IPE planner (Reeves, Goldman & Oandasan, 2007). Consistent with a constructivist approach to teaching and learning, student interaction through informal exchanges was a significant component of the learning process as they developed real-world problem-solving skills (Dirkx, 2001; Mann, 2004). As a benefit of social learning, the planning for this case-based activity aimed for the groups to achieve more by working together than they could have in individual efforts (Salomon & Perkins, 1998).

Prepare students to think critically. Two important considerations for future application of this activity include: (1) building a framework that promotes student exchange, application, and refinement of knowledge; and (2) balancing opportunities for student engagement within a set timeline (Bhogal et al., 2011). In addition to cognitive benefits, improved social dimensions of learning, such as communication and interpersonal skills, were observed. These skills may support collaborative discussions for effective application of empirical evidence to cases (Koh, Khoo, Wong, & Koh, 2008). A practical example of how we applied this was in grading the final written report. We sought evidence that students considered the peer-review feedback as an indicator of their responsiveness to areas that needed further elaboration and clarification in their revised paper. This was a significant component of their grade.

Make the case for inter-professional collaboration, challenges and opportunities. When beginning this activity, we provided students with general descriptions about inter-professional collaboration and asked them to discuss the challenges and opportunities they experienced when multiple disciplines shared knowledge and perspectives to solve problems. Several students commented on inhibitors, such as those reported by Reeves and colleagues (2007), from gaps in supervisor comfort with IPE to organizational structures and external factors. The processes of developing professional identity and cultures could influence attitudes about IPE (Hall, 2005; Mitchell, Parker & Giles, 2011). Peer feedback indicated that the case studies showed interprofessional practice and education as a complex and valuable strategy to improving health outcomes.

See problems through the eyes of another. As students collaborated on case design, differences in their professional preparation and perspectives emerged. Preformed stereotypes about professional identity could signal a need for consensus-building to describe a case scenario that seems realistic to different disciplines. Also, students discovered the development of their scenario could quickly snowball, and they faced the challenge of leaving out discipline-related teaching points to keep the case scope manageable (WHO, 2010). A critical skill for PBL is defining the problem and working with students of other disciplines, thus

requiring students to transfer their problem-solving strategies in new ways (Hmelo-Silver, 2004).

We also learned that we needed specifically to encourage students to do crosschecks on their communication, such as jargon use and assumptions about the meanings of conversations (Casimiro et al., 2009). As noted by Pippa Hall in her paper on inter-professional teamwork and professional culture, it is important to ask, "[D]o you see what I see?" (2005, p. 190). Students commented positively about the process of becoming open to forming a shared understanding of issues and considering different strengths and limitations of potential solutions. A benefit of the knowledge translation process is the focus on seeing gaps in care as others see them in order to identify effective practice changes (Graham et al., 2006).

Question assumptions about how to measure outcomes. While the students could easily agree on goals to resolve their case problem, this instructional activity required more attention to identifying and justifying measurement tools than they anticipated. Selection of measurement tools provided a meaningful avenue for collaboration to devise a plan for assessment and decision-making (Barr, 1998). Students needed to infer the nature of the data required to develop multiple solutions and evaluate the potential pros and cons based on evidence. However, students may be more comfortable when asked to apply deductive reasoning in a guided experience to resolve an assigned case problem. By accepting different disciplinary perspectives from the start, students may take additional steps to develop a flexible knowledge base and effective problem-solving skills (Hmelo-Silvers, 2004).

Secondly, students needed to develop a process for evaluating measurements found in the literature and public domain to narrow down a list of appropriate tools. Students received information about measurement selection through lecture, course readings, and discussion that they drew upon to select the health measurements that fit their case studies. Student development of skills with collaborative decision making to measure outcomes can contribute to positive health and system outcomes to meet the objectives of IPE (IOM, 2015).

Third, students needed to develop their priority measures and maintain a realistic measurement set to apply in a real-world situation. Peer feedback and class discussions helped students develop plans for monitoring and evaluation. For the case example illustrated here, students appreciated issues from a system/administration level and then focused on shortcomings in policy that may lead to improved collaborative practice. These factors reinforced that professionals should collaborate in the evaluation of variables to measure outcomes for complex problems in a practice setting.

Share perspective through constructive feedback. Providing peer review represented a quandary for the students. On one hand, students struggled with giving classmates constructive comments. On the other hand, students really wanted the feedback their peers provided. Another option would be to use a blind process. As noted in a study of a doctoral nursing program by Sethares and Morris (2016), students typically lack experience with peer review and struggle to give constructive comments. However, students recognized that constructive criticism and negotiating of opinion led to informed discussion and important reflection given the complexities of interprofessional practice (Kuziemsky & Varpio, 2011).

Discussion

The structure of this learning activity successfully aligned with IPE guidelines from the WHO to allow students from a variety of disciplines to learn with each other to develop collaborative practices and improve health outcomes (WHO, 2010). Students demonstrated the intended learning outcomes as they collaborated on describing, researching, evaluating, and making recommendations to solve complex problems. They exchanged information from their own disciplines within their groups and presented information for classmates' peer review.

The framework of the assignment provided an opportunity to "deliberatively work together" to improve community and population health care systems (IPEC, 2016). Also, this student-designed case activity incorporated students' active engagement to enhance knowledge, skills, and attitudes about interprofessional collaboration in a manner that may support practice improvements (Bhogal et al., 2011; Loyens et al., 2015). Efforts by the Canadian Interprofessional Health Collaborative emphasizes knowledge transfer as a key component of interprofessional education and collaborative practice to improve health systems (CIHC, 2009).

Combining students from different professions in the student-designed case study process supported a structured opportunity for socio-cultural learning, which is considered key to interprofessional learning (Freeth et al., 2002). Since students self-selected their group members, they freely combined forces and infused individual interest areas into the case without instructor influence. There was no indication that the combination of disciplines participating and potentially benefitting from this learning activity is limited to predetermined options. The tenets of expansive learning may be applied to this learning activity, also. By students needing to design and make recommendations to solve a problem with awareness of the perspective of other fields, they began questioning disciplinary wisdom and could move from abstract to concrete learning actions (Engeström & Sannino, 2010). These

processes may enable students to continue efforts to meet IPE goals to cross-disciplinary boundaries and build more effective networks.

As noted by Choi and Pak, the objective of interdisciplinary approaches is to resolve real world or complex problems using the different perspectives of various disciplines (2006). The literature on "learning transfer" highlights benefits from students working through multiple cases and instructor cueing (Speicher, Bell, Kehrhahn, & Casa, 2014). As students actively engaged in critiquing other cases and responded to instructor and peer feedback in the iterative process of this IPE case study activity, they may have become more proficient at problem solving. Another consideration is the complex concept theory as described by Szostak (2014). Our case study activity encourages students to explore complex problems from different perspectives. This process of analyzing complex problems may be similar to breaking down complex concepts into combinations of more basic concepts (Szostak, 2014).

With this case study we aimed to provide opportunities for students to develop real-world problem-solving skills as described in the literature (Dirkx, 2001; Mann, 2004). As we implemented exchange-based learning through case study and problem solving, these students learned about both similarities and differences in others' roles (Barr, 1996). Our findings are limited to short-term results and limited application of this course assignment at NIU. We encourage other instructors to consider the challenge of leaving the case design up to the students and support an interprofessional learning environment.

Implications

Through the development and analysis of a case study, educators can apply a problem-based learning approach with instructor guidance and peer feedback that may be well received by the students. While the assignment's five-stage process allowed for progressive building of skill levels, others could apply the premise with shortened stages in another setting or with revised student learning outcomes. The student-designed case study promoted collaborative practice between students through formal and informal interactions. As identified by others, the constructivist framework lends itself to IPE as an interactive and socialization process (Casmiro et al., 2009; Olenick et al., 2010).

Key features to consider include the dialogue, planning, and critique among classmates. First, collaboration occurs in the small groups in order to design a case and to allow inter-professional perspectives to emerge. In addition, the collaboration allows for the exploration of problems, measuring tools, and solutions from different disciplinary views to enhance the graduate students' application of research to practice. The practice of giving and receiving feedback from other disciplines can add another dimension to understanding the dynamics of inter-professional collaboration. The learning process for this activity could contribute to the development of real-world problem-solving skills.

Conclusion

This student-designed case study activity allowed students to develop collaborative competencies and to practice application of research and theory to a complex problem. Reflection on Barr's model of competency-based interprofessional education, the social-participatory learning process, and the IPE literature provided guidance for course planning. Such problem-based learning activities may support students working together and learning from each other to reach the next area of potential development that extends beyond disciplinary formation. Through interprofessional collaboration, small groups of students from different disciplines developed strategies for planning, implementing, monitoring, and evaluating a health program. Increasing student confidence with solving complex problems through collaboration in case design may enhance later skills with collaborative practice to improve health outcomes.

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Poets with a Purpose: Using Autobiographical Writing to Engage Pre-service Teachers

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Teacher educators strive for student engagement in their pre-service curricula. Recent studies of university-level engagement have focused on the need for active learning pedagogies. Grounded in anti-deficit approaches that are relevant, responsive, and sustaining for diverse cultures and literacies, this article discusses the use of autobiographical writing as a strategy for active student engagement in college Teaching English to Speakers of Other Languages (TESOL) and English Language Arts (ELA) settings. By creating these opportunities, teacher educators can encourage their students to cultivate community and a sense of belonging while they explore teacher identity. When college classrooms are transformed into spaces to expand the imagination, the implementation of such writing exercises has the potential to enhance teaching and learning now and in the future.

In a recent study of using arts-based curriculum and methods with pre-service teachers, McLaren and Arnold (2016) found that the process of writing poetry to synthesize important topics in teacher preparation encourages the development of a risk-taking pedagogy while generating inclusive teaching and learning practices. Autobiographical writing such as poetry has the power to make the pre-service experience transformative, wherein engagement with the arts helps to foster confidence and competence in developing teachers (Russell-Bowie, 2012). Due largely to issues of funding, experimental and inter-disciplinary art integration has become increasingly difficult to implement at the secondary level (Barton, Baguley, & MacDonald, 2013). As a result, pre-service teachers are arriving at universities with limited exposure to writing-for-self, which has partly discouraged teacher educators from embedding poetry within instructional units (Lemon & Garvis, 2013).

Inspired by the potential for writing to enrich the pre-service experiences of our students, we blended autobiographical exercises with our instructional design in two separate teacher education courses. The first was a Sheltered English Instruction course required for pre-service teachers seeking Teaching English to Speakers of Other Languages (TESOL) and Bilingual Education endorsements, and the second was a secondary English Language Arts (ELA) methods course featuring students completing practicum study in the semester prior to their student teaching. In this article we aim to convey the impact that writing had on the engagement of our students. In particular, we wish to further the discussion of what poetry can do for teaching and learning: to articulate the mystery of what writer Matthew Zapruder (2017) argues in his book, *Why Poetry*, "just by being alive you already do" (p. 14).

Literature Review: Reaching Disengaged Students

Engagement levels are determined by students' observable levels of involvement in academic and extracurricular activities (Astin, 1999). Predictably, university students who feel disengaged from their coursework and programs of study are at risk of underachieving and, in some instances, dropping out altogether (Messhaum-Muir, 2012). A major response to these conditions from scholars and practitioners has been to analyze engagement with regards to the various instructional practices that instructors use in their teaching (Hunzicker & Lukowiak, 2012). Numerous engagement strategies have been explored at the undergraduate level including technology-based interaction (Matthews & Johnson, 2017), collaborative note-taking (Orndorff, 2015) and integration of traditional management systems with digital tools such as Twitter (Williams & Whiting, 2016). An underlying theme in these techniques is an emphasis on growing communities wherein students can flourish in the college environment through active learning.

Active learning involves methods that privilege learner participation over teacher lecture (Prince, 2004). Practitioners have leveraged an increasing interest in teaching methods within colleges and departments to transform their pedagogies with instruction that facilitates higher levels of student engagement (Hyun, Ediger, & Lee, 2017). Instructors who feature active learning scenarios in their curricular design increase engagement with course content while also improving retention rates (Stover & Ziswiler, 2017). Placing students at the forefront of creation and participation and asking them to construct original content rather than consume information can have profound effects on their engagement in pre-service settings. This factor has been observed to be especially relevant to teacher educators preparing students to meet the needs of language learners in the areas of TESOL and ELA (Ramanayake & Williams, 2017). In light of this research, teacher educators have the opportunity to be innovative in how they underscore their curriculum and instruction with the principles of active learning.

Theoretical Framework: Anti-deficit Approaches in Teacher Education

For decades, researchers have laid bare the ways in which education policy and practice in the United States have been plagued with deficit thinking, a perspective by which ethnic minorities and students living in poverty and their families are seen as the root cause of their own lack of educational attainment and low socioeconomic status (Harrison, 2014). Valencia (1997) defines deficit thinking as the following:

> […] a person-centered explanation of school failure among individuals as linked to group membership (typically, the combination of racial/ethnic minority status and economic disadvantage). The deficit thinking framework holds that poor schooling performance is rooted in students' alleged cognitive and motivational deficits, while institutional structures and inequitable schooling arrangements that exclude students from learning are held exculpatory (p. 9).

In this assimilative blame-the-victim perspective, cultural and linguistic differences are viewed as individual and social deficiencies to be corrected and as a source of individual failure instead of a valuable foundation for learning by building on background and prior knowledge. Scholars in education remind us that these deficit views and their resulting lists of pernicious labels used for students who are seen as problems to be fixed have a long and persistent history (Bartolomé, 1999; García & Kleifgen, 2010; Valencia, 1997, 2010).

While this perspective disproportionately attributes achievement levels to individuals' membership to certain groups, anti-deficit thinking shifts the focus to shortcomings within the structure and operations of educational institutions (Valencia, 2010). Anti-deficit approaches in education enable critical analyses of the contexts surrounding student success as the need for pluralistic approaches which sustain diverse social, racial, and ethnic identities persists.

As teacher educators, in our undergraduate and graduate courses we have the opportunity to work with future teachers whose mindset may be imbued with the prevailing deficit views based on negative biases based on students' ethnicity, cultural background or socio-economic status (Bartolomé & Balderrama, 2001). In many cases, future teachers have internalized these negative assumptions towards members of their own cultural and linguistic groups (Bothelo, Cohen, Leoni, Chow, & Sastri, 2010; Darder, 2012; Freire, 2007). Breaking this cycle requires debunking the underlying myths which contribute to its persistence. In our bilingual and multicultural setting we embrace a multi-pronged critical approach which involves a culturally responsive pedagogy (Gay, 2010), a politics of caring (Valenzuela, 1999), and a carefully built curriculum which bridges the distance between the findings of current research and teaching practices, and specifically making connections between our own research and our teacher education classrooms.

In recent decades, teacher education programs have increased their awareness of the need to embrace pluralistic anti-deficit approaches both in their curricula and in their practice. Several models have emerged in critical educational theory as part of a broader effort to counter the earlier pervasive view of cultural and linguistic differences as problems to be overcome (Paris, 2012). The critical perspectives of culturally relevant education, culturally and linguistically responsive teaching, and culturally sustaining pedagogies share a basic impetus to replace the mainstream deficit approach in education with a belief that all students are capable of learning if given the opportunity (Banks et al., 2005; Ladson-Billings, 1998; Paris, 2012). Beyond responsiveness and relevance, culturally sustaining pedagogies go a step further in their call to sustain and extend "the richness of our pluralist society" by including "all of the languages, literacies, and cultural ways of being that our students and communities embody—both those marginalized and dominant" (Paris, 2012, p. 96).

Belonging and Community

The creation of spaces where students develop a sense of belonging and agency is one of the central characteristics of a culturally and linguistically responsive classroom (Gay, 2010). For college students, a sense of belonging has been recognized as a determining factor in their persistence in school (Williams Pichon, 2016). Strayhorn (2012) proposes the following definition:

> In terms of college, sense of belonging refers to students' perceived social support on campus, a feeling or sensation of connectedness, the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the group (e.g., campus community) or others on campus (e.g., faculty, peers) (p. 3)
> .

In her urgent call for teachers to recover their own imagination while cherishing their students', Greene (1995) envisions the emergence of teachers who care to make a community and to instill in their students a sense of possibility. In contrast to the general tendency to push marginalized students' voices to invisibility, these teachers are moved by a firm conviction that the students in their multicultural classrooms "have something to say about the way things might be if they

were otherwise" (Greene, 1995, p. 34). These learning communities are in constant construction, are forward-looking, and are based on solidarity as their members develop empathy for each other's stories within a group that is committed to embracing a sense of becoming. In such classrooms students reach beyond the fixed categories they would otherwise be placed in as individuals and as a group. Here students find safe spaces where their unique voices are valued and allowed freedom of expression through dialog and creative writing. For future generations of students to be able to project themselves in this forward movement by expanding their imaginations, their teachers will also need to have had opportunities to set their own imaginations free (Greene, 1995, p. 38).

Teacher Identity

As part of the theoretical underpinnings of her culturally relevant model of education, Ladson-Billings (1998) includes the significance of teachers' conceptions of self and others. For novice teachers to become culturally responsive requires of them not only to learn about their students and their communities, but also to learn about themselves (Banks et al., 2005). In teacher education programs, this exploration of self includes the development of a healthy teacher identity.

In multilingual environments, pre-service teachers who are themselves bilingual may experience a sense of insecurity about their linguistic competence (Pavlenko, 2003). Given the dominant discourse of second language acquisition theory, often bilingual adults have internalized the labels of "non-native speakers" and "permanent L2 learners." In the context of the Southwest, bilingual prospective teachers may be subject to a double linguistic oppression as well, as sometimes a low regard for their competence as English speakers may be combined with a devaluing for the varieties of Spanish spoken regionally (Ek, Sánchez, & Quijada Cerecer, 2013). Pavlenko (2003) proposes exposing bilingual teacher candidates to an alternative perspective so that they may discover their place in a community of multilingual speakers. This may allow them to replace their longing for an elusive native-speaker status with an appreciation of their own multicompetence and bilingualism.

Teacher educators may be strategically positioned to help their bilingual and multilingual students reconceptualize their teacher identities and develop "a new sense of professional agency and legitimacy" (Pavlenko, 2003, p. 251). Maxine Greene's call to release the imagination remains relevant. Among the pedagogical approaches available, different forms of autobiographical writing can create opportunities for all prospective teachers to explore "their own lives, which allows them to see themselves as cultural beings, and can lead to changes in their beliefs about literacy, schooling, and cultural identity" (Banks et al., 2005, p. 266).

Social and Emotional Learning

Establishing inclusive communities where pre-service students are encouraged to explore their literacy and cultural identities is an extension of social and emotional learning (SEL), the process by which students and teachers practice skills such as managing emotions, cultivating empathy, and establishing positive relationships in learning and life. Often a focus of child-adult interactions in K-12 settings, SEL has the capacity to enrich the lives of learners of all ages by positioning them to develop competence in both social and academic contexts, making them less likely to encounter bouts with depression and anxiety (Brackett, Elbertson, & Rivers, 2015; Greenberg, Domitrovich, Weissberg, & Durlak, 2017). Despite the growing recognition of the importance of SEL education, teachers often lack specific strategies for classroom implementation (Konishi & Park, 2017). Applying strategies such as autobiographical writing in multilingual pre-service environments has the potential to respond to individual students' needs and sensibilities (Mckown, 2017). Subsequently, future teachers may be positioned to extend experiential environments to their own classrooms through culturally relevant and sustaining pedagogies (Oberle, Domitrovich, Meyers, & Weissberg, 2016).

Exploring Personal History with Schooling Through Poetry

In an effort to engage pre-service students in active learning at an HSI (Hispanic Serving Institution), a land-grant university in the Southwest of the United States, we offered TESOL and ELA college students the chance to explore their teacher identities through autobiographical writing that focused on establishing a sense of community. Specifically, we assigned prompts that we either created or adapted from poetry scholars including Hugo (1979) and Koch and Farrell (1982). The writings were not evaluated; rather, they served as vehicles for community building and interaction between participants. Students shared their poems in both whole-class and small-group settings and discussed ways in which the writing process contributed to their developing teacher identities. The details of implementation in each classroom are presented in the following sections.

Setting 1: The TESOL Course

Sheltered English Instruction for the ESL Classroom focuses on approaches and strategies to support the acquisition of English as an additional language while learning in the content areas. In this

course, pre-service teachers discover ways of scaffolding language learning in the content areas based on current perspectives in second language acquisition and on a critical multicultural framework. Students are encouraged to further establish connections between theory and practice through a semester-long, on-site service learning experience in the context of a public school classroom. This allows them the opportunity to develop a commitment to a specific classroom community as they continue to deepen a sense of their future role as professional educators. The exploration of creative pedagogical strategies is contextualized and combined with reflection on the underlying issues of language, power, culture, and identity. The writing prompt presented below was introduced in one of the initial units of the semester which focused on building background for lessons and on the importance of teachers' familiarity with their students in order to make their teaching relevant. After reading and discussing two poems on the experiences of emergent bilingual learners written from the point of view of a student and a teacher respectively, fifteen pre-service teachers were encouraged to write about their own experience through this prompt:

> We each have our own school history. Write a poem about a moment in your school history that you remember well, that stands out for some reason. You can write about the situation, the setting, or a person. It could be a teacher or a classmate. Someone who helped you or didn't help you. Why do you remember this moment, this setting, or this person?

Setting 2: Secondary ELA Methods Course

Secondary ELA methods is a practicum-based, dual exploration of important educational theory and application of best practices in literacy and language education within years 7-12 settings. Students in this course learn how to design lesson plans that support state and national standards and are comprised of clear learning objectives, textual learning activities, and formative and summative assessment components. An early unit in the course focuses on establishing a nurturing pedagogy that includes equitable access to knowledge and empathetic stances. In the Southwestern United States, this is an important aspect given the need for teachers to support linguistically and culturally diverse student populations throughout the region. Choices made by those in positions of power can have both short-term and long-lasting effects on students and should take into account unique contexts surrounding individual learners. In this course, one of the instructor's primary goals is to model responsive attributes through specific activities within the course's curricular design.

The following prompt asked twelve students to consider the memory of people and places from their past schooling experiences:

> Write a poem about someone or something in your school past—about a former teacher, a classmate, a person you once knew, a place, a certain time. Maybe you don't really know why that particular person or time still seems so important to you. Consider the details of your memory, and let that drive your writing as you make them come alive.

Discussion

Encouraging students to engage with the course curriculum through autobiographical writing developed promising learning scenarios and generated a number of directions for further exploration. In the following section, we give an overview of our students' responses and engagement. We also categorize these preliminary descriptions under potential questions for further research grounded in culturally relevant, responsive, and sustaining education.

How Can Writing Contribute to a Sense of Community in Pre-service Education?

Teacher education programs should reflect the notion that teachers are community builders. In recounting significant moments from their past, students wrote about a range of topics such as inspiring teachers, school-wide power outages, and failed but memorable group projects, as well as intimidating tests and the experience of being the outsiders. The emotions connected to these events were also diverse: there was fondness, sadness, anxiety, anger, and excitement. What united their work was the awareness that they each had experienced situations in their past that had in some way shaped how they currently think about schooling. And inevitably, much of the work accounted for a sense of community in how the writers experienced their moments. Characters in the poems were members of families, classes, teams, and organizations with the dichotomous power of inclusion and exclusion. While we were impressed with their writing, we were equally inspired by how they expressed interest in the work of their peers. In response to the prompt, students demonstrated a feeling of empowerment and autonomy in what the activity asked them to reflect on and create. Many advocated for developing similar writing exercises in their own curricular design. Pre-service teachers could potentially embrace writing not only as an act of individual reflection, but also as a way of developing a sense of community and belonging in their own future classrooms across content areas.

In What Ways Can Writing Poetry Help Pre-service Teachers Explore Teacher Identities?

Disengagement in teacher education can result from individual students feeling lost in the college environment. Overcome by coursework and program requirements, in many cases combined with extraordinary personal hardships, many students benefit from the opportunity to revisit their original motivations for pursuing education as a career pathway. Writing about past school experiences seemed cathartic for our students in that the prompts encouraged identity exploration that allowed for reconnection with self. Writers expressed a sense of relaxation with the activity in that it allowed a break from their normalized routine, granting them the freedom to express creative thoughts and genuine emotion, not to check an item off a syllabus, but to write for the sake of writing. By describing the attributes of teachers and coaches, quoting the words of remarkable mentors, and delving into difficult circumstances in their schooling experience, our students pursued their inner lives in ways that traditional assignments such as annotated bibliographies and essays do not facilitate. These writers appeared to rediscover their teacher identities by investigating their unique histories. They also continued to develop empathy as they prepared to embrace diversity and foster pluralism in their own classrooms. Writing poetry is an activity with implications for teacher educators looking to encourage their students to shape powerful, critically engaged identities.

How Are Writing Exercises Positioned to Encourage Positive Relationships in Education?

In their poems, our students explored the impact caring friends had on their lives. They wrote about teachers who made them feel special and administrators who challenged them to succeed. Others explored their feelings of isolation as they navigated new schools, a new language or a difficult subject. Their poems featured evidence of relevant and relatable themes for students of all ages. The activity asked them to tap into their past experience and to consider the perspectives of others: the very behaviors and attitudes they will be asked to model as teachers. Teacher education courses comprise a range of important topics from instructional techniques and assessment strategies to principles of classroom management. Numerous ideas about best practices abound in all of these areas and vary among disciplines. Yet nearly all teaching, it can be argued, hinges on the ability to feel empathy for, and to connect with, others. We strive to prepare our teachers to educate students who are good at math and science and who command an understanding of geography and geology. We foster the development of capable readers and quality writers. We aspire to promote the growth of effective communicators. Most importantly, we hope to contribute to the education of good citizens who are stewards of their schools as culturally and linguistically inclusive communities. Autobiographical writing exercises have the potential to cultivate these traits. We believe active learning through poetry can position pre-service candidates to socially and emotionally connect with their future students and with one another.

Conclusion

The use of autobiographical writing is applicable across all disciplines and has the potential to impact a wide educational community. College students with low levels of engagement may struggle in their studies and even consider dropping out. As experienced in our courses, the incorporation of autobiographical poetry writing into teacher education classrooms can become a compelling strategy to boost college students' engagement. The adoption of anti-deficit approaches at the university level can take many forms. In this example, poetry not only becomes a powerful vehicle for each student's creativity and imagination but its sharing can also create opportunities for making community, building empathy, and bolstering agency in future teachers. As they develop a sense of belonging, students may also gain confidence and discover the power of language to explore and reimagine their own teacher identities. In Parini's (2008) words, "In this way, poetry becomes useful, helping readers [and writers] to comprehend their lives, to catch their ideas in language, to see through this language to what lies beyond it" (p. 114).

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