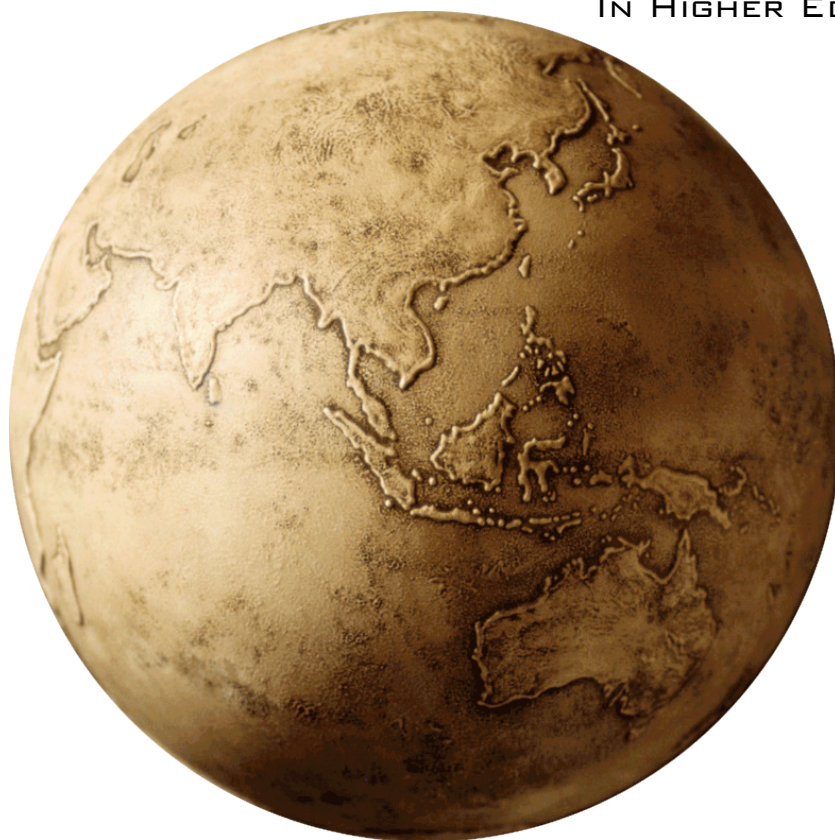


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Purpose

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 4 weeks. At the end of the four-week 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.

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Perspective-taking in Structured and Unstructured Online Discussions

Scott Chadwick
Canisius College

Ekaterina Ralston
Iowa State University

This study analyzes the extent to which students using web-based discussion boards show an increase in perspective-taking in structured and unstructured discussions. Messages from fifty-six students enrolled in one of two courses were content analyzed using Jarvela and Hakkinen's (2003) expansion of Selman's (1980) perspective-taking coding scheme. There was a significant difference in the level of perspective-taking shown across the three periods of the semester. The level of perspective-taking in structured discussions was significantly correlated with learning. Class leaders showed higher levels of perspective-taking than did other students in the class. The results suggest a relationship between use of higher order perspective-taking and learning, particularly when instructors provide structure for student discussions.

It has become a routine practice for colleges and universities to provide web-based course management and discussion software to enhance the classroom experience. Instructors understand the importance of incorporating new technology into the classroom for a variety of reasons that range from providing students quick access to content to creating an opportunity for individualized progress monitoring. Whether the web-based instructional components help student learning is left for faculty to discover on their own. The existing body of research agrees upon the web's keen ability to serve as a repository of textual, graphical, and image-based course content, as well as to provide access and the time-shifting nature of computer-mediated communication (CMC). Yet, the capability of CMC for developing students' social interaction skills, particularly when it is channeled through web-based discussion boards, is less certain. One particularly important social interaction skill is perspective-taking. A certain level of perspective-taking is needed in order to support educationally relevant interactions (Jarvela & Hakkinen, 2000). Research suggests that learning requires perspective-taking and shows that higher levels of perspective-taking are related to increased communication competence (Mezirow, 1978; Shuang & Qinhu, 2001). Since using a web-based discussion board assumes an ongoing interaction with others in a mediated environment, understanding of the potential learning outcomes of this process can be achieved through the knowledge of general effects of mediated communication on learning and more particular effects of CMC on learners' ability to focus on others (engage in perspective-taking).

Learning and CMC

Berge and Collins (1996) note that using CMC in college courses can facilitate more flexible

communication patterns, time-shifting, and a sense of equality through the social cues filtered out through the medium, so the unstructured mediated conversations among students may make communicating difficult for some. This idea is also emphasized by Allen et al. (2004) as they suggest that the student learning outcomes would differ, depending on the initial preferences and perceptions of CMC held by both students and instructors.

In college courses, web-based unstructured mediated conversations occur through a channel that provides minimal, if any, regulations on the content, structure, or focus of the conversation. Interactions in chat rooms and via instant messaging are most typically unstructured mediated conversations. Structured mediated conversations are characterized by rules or guidelines such as what is talked about, how frequently persons should participate in the conversation, and the allowable scope of the discussion. Web-based threaded discussions in courses in which the teacher assigns the topic of discussion and the parameters of how to use the discussion board is an example of structured mediated conversations.

The absence of physical copresence in a classroom poses a variety of questions with regard to student learning and instructional quality. On the one hand, presence of social cues allowing a student to identify others within a CMC process positively affects the formation of interpersonal perceptions. On the other hand, the perception of solidarity decreases as more cues are revealed (Tanis & Postmes, 2007). Thus, while the extraction of social cues is viewed positively as the means of creating a relatively comfortable and unbiased environment, it has a potential to decrease the students' interest in the learning process due to their inability to establish a meaningful connection with the instructor.

Despite the raised concerns, however, research shows that students can learn as well or better in CMC

classes than in traditional non-mediated courses (Chadwick, 1999). A review of the research literature from 1996 through July 2008 also shows that, on average, students learning via CMC outperformed students learning in face-to-face conditions (Means, Toyama, Murphy, Bakia, & Jones, 2009). CMC helps create a more interactive environment, connecting the students with each other and with the instructor. The lack of immediacy in CMC allows both parties to reconsider the wording and style of the feedback, allowing them to create a more positive and constructive communicative experience, hence, a more positive learning experience for the participants (Sutton, 2001; Hebert & Vorauer, 2003). Asynchronicity of communication also brings in some additional benefits, such as providing participants extra time to reflect on ideas, both their own and their peers' (Althaus, 1996; Hough, Smithey, & Evertson, 2004). A variety of studies also demonstrate that using web platforms helps expose students to others' perspectives that are not always available in a classroom discussion, thus providing additional means of practicing skills needed in the workplace and in team environments (Eastman & Swift, 2002; Heller & Kearsley, 1996; Hutchins, 2001; Kirkpatrick, 2005).

Learning and Perspective-taking

Thinking about one's self in relation to others is part of the perspective-taking process. Service-learning, as a pedagogy, provides experiential learning through a cycle of acting and reflecting as students seek to integrate knowledge of course content with an understanding of how their actions affect the people they are serving (Eyler & Giles, 1999). Providing a learning environment in which workplace skills and teamwork are embedded can be accomplished by building course assignments around consulting activities (Dallimore & Souza, 2002), which fits well with service-learning. Those activities teach students how to recognize and propose solutions to actual business problems, while not inhibiting coverage of course content. Incorporating service-learning into the class can further infuse course content into students' real-world activities while providing the additional benefit of allowing students to reflect on the value and meaning of those activities (Bush-Bacelis, 1998).

Part of the service-learning reflection process includes learning to understand the perspective of the other people with whom the students interact. Perspective-taking refers to the ability of a person to understand and incorporate another's perspective into one's own messages in order to engage in discussion with that other person. The ability to cognitively move from just a sense of self to a sense of self and others, then develop and articulate messages incorporating self

and other, is described further in the theories of individual and social development of Piaget (1926) and Mead (1934). Subsequent research found a relationship between the development of perspective-taking and communication competence both for constructing informational messages (Flavell, Botkin, Fry, Wright, & Jarvis, 1968) and persuasive messages (Clark & Delia, 1976). Further, the capacity for perspective-taking for communicative intent does improve as children develop (Clark & Delia, 1977).

Selman (1980) developed a coding scheme in order to study social perspective-taking in the development of communication skills in children. The author identifies five levels of perspective-taking ranging from basic to advanced: *egocentric*, *subjective*, *reciprocal*, *mutual* and *societal-symbolic*. At the egocentric level, individuals clearly differentiate between themselves and others as physical entities. As no psychological differentiation is developed at this stage, individuals tend to not recognize that others may perceive a similar situation differently.

Persons at the subjective level can distinguish between the potential presence of a subjective perspective of the other and relate perspectives solely with regard to the ones of the actor. Thus, communication of the perspectives occurs in one-way, unilateral terms. The reciprocal stage allows for a two-way connection that assumes that the actor and the other can have differences in perspectives. Individual value systems and objectives are recognized within the context of the interaction but outside of the entire relationship system between the actors.

At the mutual level of perspective-taking individuals are able to comprehend their interactions with others within an ongoing system where genuine understanding of the other is necessary. Therefore, at this stage individuals are capable of attaining a third-person perspective that lies outside of their own. The societal-symbolic stage is the most advanced as the actors are able to consider themselves and others within the broad context of society, structured around the social norms and values. In order to facilitate communication and reach accurate understanding, the actors consider the existing shared viewpoints of the system and simultaneously recognize the multiplicity of the individual perspectives that exist within the system as a whole.

Jarvela and Hakkinen (2000) extended the applications of Selman's approach to assess perspective-taking levels in asynchronous electronic discussions. The goal of Jarvela and Hakkinen's research was to determine if students are able to reach sufficiently high levels of perspective-taking in online discussions to support educationally relevant interactions. Their findings show that higher-levels of perspective-taking are related to higher-level

discussions. This finding was replicated in semi-structured web-based discussions as well (Jarvela & Hakkinen, 2002; Hakkinen & Jarvela, 2006). Shuang & Qinhu (2001) also found that students participating in a higher-level theoretical discussion exhibited the higher levels of perspective-taking (*i.e.*, mutual perspective-taking) compared to students involved in discussions where conclusions were developed mostly out of personal opinions. So, while there is a foundation of understanding that perspective-taking matters in online discussions, less is known about the relationship to structured and unstructured discussions.

One cannot necessarily conclude that individuals will always use the highest order of perspective-taking within any one conversation. In fact, it is likely that perspective-taking use is developmental socially as well as individually. That is, if a person can effectively use perspective-taking, they may take time within a social interaction to determine the extent to which that perspective-taking will be used and rewarded by others. O'Keefe and Johnston (1989) argue that "development occurs as a result of our interactions in the world and is deeply dependent on both our present ways of constructing interpretations (what we individually bring to an interaction) and the interactions in which we engage (our experiences with other persons)" (p. 21). Thus, perspective-taking should not be considered to be automatically present just because an adult communicator can perform it. If there is little use and/or reward by others, or if the situation is not structured to require it, then perspective-taking may not be needed or may be perceived to be risky to engage in. However, if perspective-taking affords some benefit, such as facilitating task completion, then it is likely to grow over time. Our first research question seeks to learn more in this area.

Question 1: Is there a change in the levels of perspective-taking demonstrated over time in a class?

Research shows that building problem-oriented case work and group reflection into a course can lead to higher-levels of perspective-taking in online discussions (Hakkinen, Jarvela, & Byman, 2001). Effectively, these researchers created a structured environment in which online discussions would take place. Their findings show that providing real-world experiences in the form of consulting-based / service-learning courses as a part of the overall educational experience is important. However, the study does not address the presence of differences in perspective-taking between two service-learning, consulting-based courses, which use structured and unstructured online discussions as the supplementary communicative means. Our second research question seeks to learn more in that area.

Question 2: Are there differences in perspective-taking between structured and unstructured online discussions?

Research on perspective-taking suggests that it is necessary for learning to occur, however, an individual's ability to engage in higher-levels of perspective-taking is related to the individual's communication competence (Mezirow, 1978; Shuang & Qinhu, 2001). Students use perspective-taking to move from relatively simple understandings of phenomena to more complex, interdependent understandings.

Proper assessment of student learning requires an established connection among course learning goals and student performances that directly demonstrate the acquisition and enactment of those learning goals. It is possible to design a grading system in which grades are based on student performance linked directly to the course learning goals (Palomba & Banta, 1999; Suskie, 2004). The courses, and their grading systems, used in this study were constructed in such a manner. In such a case, it is possible to determine if there is a relationship between the extent of perspective-taking used by a student and the grades the student receives in a learning environment. Accordingly, research question three asks:

Question 3: What is the relationship between the average level of perspective-taking a student uses and the grade that student earns?

An important property of the class that utilized the unstructured discussion form is its initial organization. The class consisted of six competing groups with nominated leaders, responsible for the group functioning and the term project outcomes. This circumstance created a unique opportunity for us to explore the differences in the ways leaders and followers acquire and develop their perspective-taking ability. Etzioni (1965) proposes that task-oriented groups tend to produce two types of leadership: an expressive (or social-emotional) leader, who ranks higher than other actors in such interaction categories as "showing solidarity" and "asking for suggestions;" the other, an instrumental (or task-oriented) leader, who ranks higher than other actors in such categories as "giving suggestions" and "showing disagreement" (p.689).

It is possible then to suggest that an instrumental leader could exercise his or her authority regardless of the perspective of others in order to accomplish the task. At the same time, an expressive leader will be more likely to seek other group members' input by advancing his or her own level of perspective-taking to accommodate or account for more than his or her own points of view. As the original postings on the

discussion boards included students' names, it was possible to distinguish between the postings of leaders and followers. Therefore, the connection between the leadership position and the perspective-taking ability is a focus of research question four:

Question 4: Is there a difference in levels of perspective-taking between the leaders and the followers?

Method

The data for this study were collected over two 15-week semesters at a large Midwestern university. Two courses were used in this study: an undergraduate communication research methods course ($n = 39$) and an undergraduate/graduate student organizational consulting course ($n = 17$ [17 undergraduates who have used the discussion board]).

Both courses included service-learning components that allowed students to learn course content, apply the content to an actual organization, and reflect upon their service to the organization. Students in each course were divided into seven work groups. Course grading systems were developed based on guidelines suggested by Walvoord and Anderson (1998) in order to have grades reflect student learning based on course learning goals. The grading systems effectively served as an assessment of student learning providing direct evidence of the degree to which students achieved the stated course learning goals.

Discussion Boards Use

Two types of discussion boards are employed in the study: structured – used in the methods course, and unstructured – used in the consulting course. The participation in the structured discussion board is characterized by the focused development of discussion threads led by a discussion moderator. This type of discussion board presents a standard format with established boundaries of a) presence of a weekly discussion question, b) prescribed participation, and c) presence of a moderator assigned by the instructor. In structured discussions, the instructor provided the topic for discussion, linked to what was happening in the course and effectively setting the agenda on what would be discussed and the parameters of how broad the discussion would be. The moderator was a senior undergraduate student who had successfully completed the course in a previous semester. Structured discussion boards are initiated and developed by the instructor in order to facilitate instructor-learner communication.

Unstructured discussion boards are essentially different as they are developed as a supplementary tool that primarily facilitates student-student communication.

In the consulting class, the board was not monitored by a moderator or instructor, nor did it possess a pre-established structure (such as number of rubrics or a set of discussion questions). The discussion threads occurred sporadically based on the needs of the students, and participation in unstructured boards was not made mandatory by the instructor. Since the instructor did not provide any discussion parameters or an agenda, the discussion topics arose from the students themselves as warranted by the work the students did and their need for talking about things with other students.

Two electronic platforms were used for setting up the discussions in the classes. The methods course posted the messages on WebCT, while the consulting course used Appleshare discussion board. The functional difference between the two software products is that Appleshare allowed students to construct their own topics and discussion threads while WebCT was not configured to allow that functionality. No other substantive difference existed between the two packages. Students were provided in-class instructions on how to use the discussion boards and then began using them after the first week of the class. The use of boards terminated prior to finals week.

In the structured online discussion condition, the discussion moderator posted a question weekly on WebCT. The question related to the experiences students were having with course content, using information technology for course assignments, and applying course content to their partnered organization. The students were expected to respond to the discussion question during the week, comparing their experiences and thoughts with those of their peers.

In the unstructured online discussion condition, students created and used discussion topics via Appleshare to coordinate their activities and reflect on their experiences. In keeping with an unstructured format, participation in the discussion board was not mandatory.

Data Collection

The data for the study were gathered upon completion of each class. The messages were captured for analysis into a Microsoft Word file. Overall, 361 messages “structured” messages and 147 “unstructured” messages were collected, along with topic and date identifiers. All the messages were then coded according to the established coding scheme.

Coding Scheme

This study adapted Selman's (1980) original coding scheme and Jarvela and Hakkinen's (2003) expansion of that scheme to fit the communicative dynamics of asynchronous communication. The five codes, explanations of those codes, and examples of each are provided in Table 1.

Table 1
Perspective-taking Coding Scheme with Examples

Code	Explanation	Example
Egocentric	Participants express their opinions in an egocentric and subjective manner. Opinions, suggestions and concerns of other people, if mentioned, are not taken into consideration by the author of the message. Task-oriented, directive and fact inquiry messages are included into this category.	Hi all, I will talk with you in class to discuss forming our final information about what will and what will not work for methods.
Subjective	Participants recognize, implicitly or explicitly, the involvement of other people in the discussion. They also recognize that other people could be affected by the results of the discussion or action. The recognition, however, is not followed by expressing agreement or arguing with the other existing point of view. The messages focus on the author's understanding of the situation.	Hello, I know that we will be receiving a lot of information in the next few weeks. I do anticipate that each of us will have a hand in different aspects of the audit, so the expertise on certain areas will be expected.
Reciprocal	The authors acknowledge the presence of other perspectives and may engage them. The recognition could be followed with a reaction such as approval, counter-argument, encouragement or expression of gratitude.	I think there are many, many pressing communication-related issues facing us today and it's hard to narrow it down to just one. I do agree with Annie, though, and believe a major issue is the lack of communication within marriages.
Mutual	The authors acknowledge other people's perspectives and also their effect on their own perspectives and opinions. These messages demonstrate the dynamics of engagement in other perspectives. Messages of this type also express group identities and discuss the subject matter from a third-person or "generalized other" perspective.	We met as a group tonight and did discuss some of the topics that the group commented on. One main topic was the fact that patients feel that their doctors sometimes have too many patients and they can't fully answer some of the questions that they have. This made us realize that they might resort to communication between their pharmacist or others within support groups. This made us realize that we should also touch on assertiveness in communication and the important of getting help and your questions answered.
Societal-Symbolic	The authors could consider multiple perspectives of many or all people who potentially could be affected by the outcomes of the discussion. These messages could contain references to various opinions and suggestions expressed by other discussion members. Subject matter of these messages are analyzed from theoretical, cultural, moral and societal perspectives. No societal-symbolic messages were encountered during the analysis, thus, no examples provided. The absence of these messages was also experienced in part one of Hakkinen, Jarvela, and Bynam's 2001 study.	We did not encounter a societal-symbolic message in the data. A theoretical example of such a message would be, "We know from our coursework that a variety of theories can be used to explain human behavior in organizations. If we encounter a situation in which that behavior creates conflict, then in order to help resolve that conflict we will have to be aware of each person's paradigm for their role in the organization, the organization's goals, and our own conflict resolution skills."

Coding Scheme

This study adapted Selman's (1980) original coding scheme and Jarvela and Hakkinen's (2003) expansion of that scheme to fit the communicative dynamics of asynchronous communication. The five codes, explanations of those codes, and examples of each are provided in Table 1.

Data Analysis

Before performing the coding of the entire data, two weeks of the WebCT messages and two categories of Appleshare threads were randomly selected for the coders'

reliability test. Each set of messages was individually coded by the authors and then compared to determine intercoders' reliability using Scott's π ($\pi = .902$). Lombard, Snyder-Duch, and Bracken (2002; 2003) state that coefficients of intercoders' reliability of .90 and above are always acceptable, providing the basis for randomly dividing the remaining messages into two equal parts that were coded separately according to the scheme.

The first research question seeks to find the dynamics of advancement in perspective-taking levels over time. For this purpose the data were divided by the weeks of the semester during which the messages were posted. Both classes posted online messages over a 13-week period. In order to create comparable units,

Table 2
Longitudinal Change in Perspective-taking
Levels in Both Classes Combined

Perspective-taking code	Section of the Semester			Total
	Weeks 1-5	Weeks 6-10	Weeks 11-15	
Egocentric	76	94	72	242
Subjective	38	96	37	171
Reciprocal perspective-taking	6	45	28	79
Mutual perspective-taking	2	12	2	16
Total	122	247	139	508

Table 3
Number of Perspective-taking Messages
by Time Period for Each Class

Message Type	Weeks 1-4	Weeks 5-9	Weeks 10-13	Total
Egocentric				
Structured	70	47	36	153
Unstructured	6	47	36	89
Subjective-role-taking				
Structured	36	88	27	151
Unstructured	2	8	10	20
Reciprocal perspective-taking				
Structured	3	25	16	44
Unstructured	3	20	12	35
Mutual perspective-taking				
Structured	2	11	0	13
Unstructured	0	1	2	3
Total				
Structured	111	171	79	361
Unstructured	11	76	60	147

the data were split into three sets: the beginning (weeks 1-4), the middle (weeks 5-9), and the end (weeks 10-13).

In order to trace the changes over time, a series of cross-tabulations was performed for each group individually. The chi-square tests were requested for testing the statistical significance of the findings. A series of simple linear regressions was performed for each group to establish a presence of association between the level of perspective-taking engaged by students and the progress of time across the semester.

The answer to the second research question required a comparison of means between the two samples. Therefore, an independent sample t-test was performed. Analysis of research question three required the creation of a separate dataset where two new variables were computed: the average level of perspective-taking for each individual participating in the discussion boards, and the final grade received by each individual at the end of each course. Correlations were run in order to establish a presence of the association between the two variables in order to answer the fourth research question and determine whether there is a difference in assumed levels of perspective-taking between the leaders and the followers in the unstructured class (the only set that had

a division between the leaders and followers), a t-test and a cross-tabulation with chi-square procedures were performed.

Results

The first research question attempted to discern changes in the levels of perspective-taking students employed over the length of the semester. The results of cross-tabulation for the entire set of messages for both classes combined demonstrated the presence of a change in perspective-taking levels in messages throughout the semester (Table 2). A chi-square test showed a presence of statistically significant association ($X^2_6 = 31.382$, $p < 0.001$).

Closer examination of each class separately, however, showed a presence of two different dynamics (Table 3). The structured discussion experienced a decrease in the number of "egocentric" messages in the third part of the semester, compared to the first part, and the number of egocentric messages decreased in the middle of the semester, compared to both the first and the third parts. The number of "subjective" and "mutual" messages increased during the middle of the semester and decreased during the last third. The number of "reciprocal" messages increased by the

second part of the semester and showed only a slight increase during the third part of the semester. Results of the chi-square test for this group showed to be statistically significant ($X^2_6 = 48.477$, $p < 0.001$).

The evolution of the unstructured postings was different. The number of “egocentric” messages posted increased during the middle part of the semester and decreased in its third part. The “subjective” and “reciprocal” messages followed a similar pattern; yet, the decrease in the number of “subjective” messages in the third part of the semester was minor. There were only three “mutual” messages in this group throughout the semester. A chi-square test showed no presence of statistically significant association ($X^2_6 = 2.735$, $p = .841$, n.s.).

These results were extended by performing simple linear regressions for the structured and unstructured sets of messages. The regressions were performed for the purposes of verifying the existing relationships between the two variables: students’ perspective-taking and time in the semester. The linear regression analysis for the structured discussions resulted in an $R^2 = .030$, $SE = .788$, with an $F(1,359) = 10.921$, $p < .001$. Thus, there are grounds to suggest the presence of a relationship between the variables as well as the existence of patterns in individual perspective-taking across the semester. However, the linear regression analysis for the unstructured discussions did not show statistical significance ($R^2 = .000$, $SE = .911$, with an $F(1,145) = .022$, n.s.).

The second research question asked if there were differences in perspective-taking between structured and unstructured online discussions. An independent sample t-test was run to determine differences in students’ use of different levels of perspective-taking between the two classes. The analysis indicated the presence of statistically significant differences ($F=14.188$, $p<.000$).

In order to answer the third research question, correlations were performed to determine if the students’ level of perspective-taking and grades were significantly related. Level of perspective-taking and grades were significantly correlated in the structured discussion class ($r = .365$, $p < .05$) but not in the unstructured discussion class ($r = -.331$, $p = .210$, n.s.). For the structured discussion class, regression analysis shows that 13 percent of the variance in grades can be explained by the extent and levels of perspective-taking used ($R^2 = .133$, $SE = .571$, with an $F(1,36) = 5.370$, $p<.05$). The results of a regression analysis for the “unstructured” class showed no significant association between the variables ($R^2 = .110$, $SE = .527$, with an $F(1,15) = 1.724$, n.s.).

The investigation of the fourth research question focused on examining the difference between the levels of perspective-taking assumed by leaders and followers.

The dataset used for the analysis was limited solely to the class that used the unstructured discussion format. The results of a t-test showed insufficient difference in means between the groups (leader=1.61, follower=1.81). The cross-tabulation demonstrated the comparison of various perspective-taking levels in postings between the leaders and followers (Table 4), and the chi-square results showed no statistical significance to substantiate the difference ($X^2_3 = 6.720$, $p = .081$, n.s.). It is, however, important to notice the difference in the actual number of messages on the subjective role-taking level: the leaders produced fewer than half (42%) the messages of this level than the followers. The followers, however, did not exhibit any mutual perspective-taking level in their messages, while leaders produced three.

Table 4
Difference in Perspective-taking
Between Leaders and Followers

Category	Follower	Leader	Total
Egocentric	50	39	89
Subjective role-taking	14	6	20
Reciprocal perspective-taking	16	19	35
Mutual perspective-taking	0	3	3
Total	80	67	147

It is also important to notice that examination of these relationships among the entire pool of leaders’ messages and the messages produced by the followers demonstrated that the difference between the groups is statistically significant ($X^2_3 = 24.378$, $p < .0001$). Despite the fact that such a result could be attributed to the susceptibility of the chi-square test to the sample size, this does not fully explain the difference between the groups, leaving the question open for further investigation.

Discussion

Changes in levels of perspective-taking did occur in the structured discussions but not in the unstructured discussions. In the structured discussion class, low-level perspective-taking messages (i.e., egocentric) started high, dipped, then ended up higher. Mid-level perspective-taking messages (i.e., subjective and reciprocal) increased drastically from the first to second thirds of the class, falling off or stabilizing at the end of the class. High-level perspective-taking (i.e., mutual) also showed a dramatic increase and then a falling off on a percentage basis, though in actual numbers, the change was small. This makes sense if one considers a typical class dynamic. At the beginning of a semester, students are concerned with understanding the class,

learning their role(s) in the class, and understanding how to orient to their work-group members. Egocentric levels of the messages at the beginning of the semester can potentially be attributed to Goffman's (1967) idea of building a socially acceptable perception of self and then maintaining it. Centering messages on one's perspective in this context is similar to the disclosure of personal details during regular, co-present, cue-filled interaction. Ramirez and Burgoon (2004) argue that initial interactions serve as a basis for further elaboration of the relationships given that various indications of "the degree of involvement, mutual co-orientation, perceived common ground and connection, mutual understanding, ...and interactional coordination" (p. 439) are presented and exchanged by all the participants. According to our rubric, instrumental, task-oriented messages were associated with the lower levels of perspective-taking. At the beginning of the semester, students are attempting to present themselves as interested members of the group, willing to cooperate and exchange ideas. They present their ideas as pertaining to specific tasks and as their individual accomplishments, which is compliant with the egocentric level.

Low-level perspective-taking is not surprising as roles and relationships are being probed and defined. As those roles and relationships are understood and developed, toward the middle of the semester messages are needed to facilitate productive group interaction, the sharing of ideas, and the smoothing of budding conflicts. Thus, higher-level perspective-taking messages are in order. Toward the end of the semester, it is not uncommon for students to complain about the time demands they are under. Within a class, it is necessary to focus on the task at hand, particularly if good working relationships have already been established. If the group integration is lacking and the working relationships are not as productive, it is also important to stay focused on the task and communicate this focus through task-oriented messages in order to create the evidence of continuous work to support any potential dispute over the input into group work. Therefore, a reduction of higher-level perspective-taking messages should be expected in both scenarios.

The fact that no significant changes in the levels of perspective-taking messages occurred in the unstructured discussion class may rest on the students' task focus. Message trends were similar between both classes, but students in the unstructured discussion class focused their topics of discussion on tasks to be accomplished, letting reflective comments come up organically or using face-to-face group meetings to engage in those types of messages. It would be interesting to learn if a simple instruction given at the beginning of the class could lead to more, higher-level perspective-taking in an unstructured environment.

Such an instruction might tell students they are free to form their own topics, but they need to specifically build reflection into the discussion. This semi-structured approach warrants investigation. Similarly, capturing both the online and offline messages used by groups would tell researchers if the presence or lack of structure modifies what students talk about and in which venue they talk about it.

No differences were found in the average value of perspective-taking messages between the structured and unstructured discussions. Trends in differences in perspective-taking appear to be shaped by group formation and task activities in the structured class but only by task activities in the unstructured class. Calculating an average perspective-taking score across the semester, as we did to answer this question, hides the variance that was brought to light by research question one.

As with research question one, the investigation of research question three demonstrated that there is a relationship in the structured class but not in the unstructured class. We believe there exists a significant relationship between perspective-taking and grades across both classes, but because the unstructured discussions focused so heavily on task-oriented matters, the full range of perspective-taking was not made manifest online. Again, capturing messages on and offline would give us better visibility to this relationship. However, it is important that perspective-taking was found to be significantly related to grades in the unstructured discussion class. This provides some support for Mezirow's (1978) integration of perspective-taking into the learning process. Although future research will help investigate whether perspective-taking is related to or even increases learning across all academic disciplines and task domains, the present study demonstrates that various levels of perspective-taking can be used in the process of achieving learning goals ranging from gaining deeper understanding of a subject to learning how to implement a hands-on task in a timely manner.

Holding the assumption that higher-levels of perspective-taking are always warranted may lead to inefficiencies in the classroom and in the workplace for those learning and workplace situations that do not benefit from messages coming from higher-levels of perspective-taking. The evidence of this is rooted in the initial differences between the investigated populations, as the earlier studies (Piaget, 1926; Mead, 1934) suggest.

Regarding the inquiry into the differences in perspective-taking between the leaders and the followers, no significant difference was found. This question, however, remains open and has potential for future investigation, as the limitations of the current study could have constrained the findings in a variety of

ways. Should this question be addressed again in the future, the following steps would allow determining its viability: a) an initial assessment of the leadership styles should be conducted to provide an insight into the potential influence of the style on the level of perspective-taking assumed by the leader throughout the duration of the group work, and b) a requirement to share thoughts online on a regular basis should be set up for both leaders and followers in order to create an environment conducive for a variety of messages, not only instrumental and task-oriented but also reflexive and cooperative.

Limitations

The main potential limitation is the lack of the initial appraisal of the leadership styles to determine the inclination of the leaders' to produce messages on a particular level of perspective-taking. The fact that only one class employed the system of leaders and followers potentially constrained the analysis as the number of messages in the set was limited. The examination of this relationship with a larger sample size could provide an important insight into our understanding of the issue.

Some readers may argue that the level of the two classes may be problematic, as the structured discussion class was at a lower level in the curriculum than was the unstructured discussion class. If course level in a curriculum mattered, we would expect to see higher-levels of perspective-taking in the higher-level course. That was not the case here. That all of the students in our sample were able to engage in perspective-taking further supports our contention. Allowing topical choice and students' use of the online discussion for task completion in the higher-level class is what explained the differences in perspective-taking.

Conclusion

There appears to be evidence that teachers can structure online discussions to increase the levels of perspective-taking and to increase students' learning as measured by grades. This finding extends the research on the use of online discussion. Previous research has shown that such online discussion can approximate the robustness/dynamics experienced in face-to-face discussions (Jarvela & Hakkinen, 2000; Shuang & Qinhu, 2001). This study extends the findings of that research by showing a connection between perspective-taking in online discussions and student learning: presented with a necessity to maintain regular theoretical discussions, the students demonstrated a longitudinal increase in their level of perspective-taking, while students that were presented with instrumented tasks did not demonstrate a similar change.

This study shows that students do engage in different forms of perspective-taking when they communicate with each other during online discussions. This may be useful information in the course development process, particularly for online course creation. With increased attention being placed on student learning outcomes and assessment, gaining visibility to how students orient to each other through their discussions can help show personal growth. To the extent that such growth is part of a learning goal of the course, the academic program, or the institution, the methods used in this study provide one method for assessing the attainment of that learning goal. This is especially useful to teachers and designers of online courses who are looking for ways to build community and engagement as part of the class culture.

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Developing an Undergraduate Global Citizenship Program: Challenges of Definition and Assessment

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This article describes the development of an undergraduate interdisciplinary global citizenship program. The process of program development was guided by the core belief that students need not only information and skills, but the tools to develop their own individual citizenship in today's world. Using document analysis, interviews with key informants and survey data from faculty involved in course development and delivery, the authors examine the challenges of construct definition, of establishing learning outcomes, and of program assessment that confronted the program developers. The article concludes with an exploration of the underlying assumption that university programs are effective means for building an engaged citizenry.

Changing times call for changing approaches. The dramatic developments in the flow of capital, labor, goods and services, and information that have come to be termed 'globalization' have led many colleges and universities to re-examine their curricula in light of the skills needed by students to take their place in a global workforce (Humphreys, 1998). Ethnic intolerance, world-wide migration, and global warming have prompted similar concerns about student understanding of the need for commitment to civic engagement, social responsibility, and global stewardship (Adams & Zhou-McGovern, 1993). Not surprisingly, some attempts are being made to link two concerns – civic engagement and skills for operating in an environment of globalization. For example, the Association of American Colleges and Universities (AAC&U) explicitly focuses its efforts on global learning and social responsibility, emphasizing the need to develop social, civic, and global knowledge in university graduates by linking liberal education with democracy (AAC&U, 1999). Funded jointly by the AAC&U's ongoing initiative, *Shared Futures: Learning for a World Lived in Common*, and the U.S. Department of Education Fund for the Improvement of Post Secondary Education (FIPSE), in 2002 ten colleges and universities began the construction of new global studies curricula designed to spur civic engagement and social responsibility, promote democracy, and cultivate intercultural competencies. The ten participating colleges and universities looked at modifying their existing majors, restructuring their minors, and/or rethinking the internship and study abroad opportunities available to their students. The ten colleges and universities competitively chosen to participate in "Liberal Education and Global Citizenship: The Arts of Democracy," are: Albany State University, Beloit College, CUNY – Brooklyn College, Heritage College, John Carroll University, Pacific Lutheran University, Rochester Institute of Technology, University of Alaska

Fairbanks, University of Delaware, and University of Wisconsin.

These programs, as well as the many others developed by individual educational organizations across the U.S., all rest on the assumption that post-secondary institutions play a critical role in the development of tomorrow's citizens, both U.S. citizens and global citizens (Grudzinski-Hall, 2007). Caryn McTighe Musil, Project Director at AAC&U, stated that:

The academy is committed to moving this agenda to the center of higher education reform efforts. The world is plagued by violence and injustice and a host of complex problems that need sophisticated, collective solutions. Higher education is clearly one of the places to address these problems by educating students in ways that promote active engagement and a sense of shared obligation to humanity as a whole (University of Alaska Fairbanks [UAF], 2002).

Many colleges and universities are building global programs and are revisiting their institutional mission statements and strategic plans in order to provide both justification and support for their newly launched educational initiatives (Hovland, 2005). However, the very complexity of these problems that higher education programs must seek to address present, at a program implementation level, challenging issues of definition of terms and student learning outcomes and of short and long term program assessment (Andrzejewski & Alessio, 1999). Since there is no accepted definition of the term "global citizenship," it is not surprising that no consensus exists concerning the design of undergraduate global citizenship programs by those who direct its curriculum. Colleges and universities that have launched such programs have done so using a variety of methods.

We seek in this article to examine the challenges of construct definition, establishing learning outcomes, and program assessment that confronted and are still engaging a U.S. university that has initiated an undergraduate global citizenship program. Consistent with the AAC&U's emphasis on using higher education to foster the intersection of global studies and renewed civic engagement/responsibility, the Global Citizenship Program (GCP) at Lehigh University in Pennsylvania was initiated in 2001, admitting its first group of students in 2004. The program is based on the core belief that students need not only information and skills, but also the tools to explicitly develop their own individual citizenship in today's world. We will describe the processes involved in establishing the structure and intent of the program including issues surrounding the definition of the term *global citizen*, and examine attempts to build an assessment model to measure the effectiveness of the program. Finally, we will explore the underlying assumption that university programs are effective means for building an engaged citizenry.

Purpose

Our objective in this article is to present a case study of the process of program development around a contested construct, that of global citizenship. While primarily descriptive in nature, the study seeks to draw out issues of student and program evaluation that are specifically linked to the nature of this guiding construct. The data is drawn from archive document analysis and from interviews with key informants involved in the initial discussions and implementation of Lehigh's Global Citizenship Program. The documents include the formal program descriptions available to prospective students as well as the meeting minutes and recommendations of the initial group of faculty who engaged in discussions around the launching of the program, the application for funding, and decisions regarding program structure and student enrollment. The minutes provide a basic historical record of the development of the program, and they shaped the prompts we used when interviewing key informants. These key informants included both the president and provost of the university at the time the program was initiated, two members the faculty committee involved in initial discussions about the program, together with a faculty director of the program and a program administrator. These participants were consulted as the documentary evidence was analyzed and questions arose, and they fleshed out the description of the program development discussions for us. They also provided us with an understanding of the consideration, or lack of it, given to program and student evaluation, and the debate over definitions of

global citizenship that influenced early program decisions.

In addition, other sources of data provided us with a means of triangulating the perspectives and understandings of current participants, both faculty and students, involved in the global citizen program. Survey material collected from faculty members involved in seminars since 2004 concerning course development within the program was analyzed (Sperandio, Grundzinski-Hall, & Stewart-Gambino, 2008). Student essays written when applying to the program, end of program student surveys, and program administrators' video-taped interviews of students describing their progress towards their own vision of a global citizen, were also made available to us. These sources provided additional insights into the complexities of both student and program assessment.

The authors/researchers have all had direct involvement in the program. One was the faculty program director, one a faculty participant in the interdisciplinary faculty seminars that are an ongoing feature of the program, and one was directly involved in the managing of day to day operations of the program and advising of its 100+ students. While we appreciate this involvement may have colored our objectivity, we would argue that this is offset by the multiple perspectives and in-depth understanding of the program that we collectively now have.

Lehigh's Global Citizenship Program

Assumptions and Ambitions

The group of faculty (ranging from six to ten members during the course of program development) from the three undergraduate colleges at Lehigh University (business and economics, arts and sciences, and engineering) who developed the framework of the GCP were initially involved in issues of definition. Thus, before turning to what it means to develop a curriculum that fosters citizenship, much less the development of global citizens, the group discussions focused on common assumptions behind globalization. The following understandings emerged from these initial discussions as documented in program files between 2001 through 2007:

The need for tools for operating in a global environment. Today's college and university students enter their adulthoods as workers, family and community members, and citizens facing a far different, and far smaller world than did their parents or grandparents. The rapid technological developments that enable almost instantaneous circulation of information, capital, services, and labor blur the traditional territorial boundaries between nations and cultures in a way that is historically unprecedented

(Castells, 1999). Although the concept of globalization means different things to different people, it does connote the basic truth that today's technology makes crossing national boundaries easier for everyone. International travel and work are no longer the province of the elite or a subset of occupations.

Preserving undergraduate curricular silos such as Lehigh University's very popular business major in the 1980s and 90s called *International Careers* seems increasingly anachronistic. Whether as virtual tourists, business travelers, consumers of internationalized services, or simply owners of computers sitting on the phone with a customer service representative in India, very few people have no brush with the world outside of U.S. borders. Thus, the first imperative for colleges and universities today is to provide students with the intellectual tools to understand the forces of globalization and technological change in order to make informed career and personal choices.

The need for tools for understanding global responsibilities. Simply providing information and training for students to take their places in the global economy is not sufficient. Since U.S. foreign policy adopted a unilateralist stance dedicated to preserving and furthering U.S. interests in the world, the American profile abroad is higher than ever. This heightened profile brings with it special responsibilities for U.S. citizens. National sensitivities to anti-Americanism is at an all-time high following the events of 9/11, and students must understand both the dangers that the American profile brings with it as well as the responsibilities that individuals bear in representing the U.S. beyond the world's stereotypes.

The U.S. presents two faces to the world. In terms of military expenditure, it dwarfs that of any other nation (Stalenheim, Kelly, Perdomo, Perlofreema & Skon, 2009). At the same time, private American donations help ameliorate such crises as the AIDS epidemic in Africa and fund critically important humanitarian initiatives in the world (Clinton Foundation, 2009; McCoy, Kembhavi, Patel, & Luintel, 2009). America's stance in world affairs affects U.S. citizens abroad and at home in ways that we do not yet fully understand. Colleges and universities should provide more than information and training for individual career choices in a globalized world. Students need the tools for understanding their individual responsibilities as citizens of a world in which the U.S. is, and will remain for the foreseeable future, a driving force economically, militarily, and culturally.

The need for understanding responsibility at the community, national, and world level. The U.S. economic, strategic, and military interests will continue to shape international realities. The U.S. electorate will be asked to vote for national candidates on the basis of

their vision for their country's role in the world. The concern for the decline of participation in public issues that drives civic engagement initiatives in both K-12 and university curricula should also guide our decisions regarding the perspectives acquired by students when studying the non-U.S. world. U.S. students are woefully ignorant of world affairs, much less the rich cultural and historical traditions of other countries or peoples (Andrzejewski & Alessio, 1999; Ehrlich, 2000; McConnell, 2002). A more deliberate strategy of integrating international awareness into U.S. efforts to strengthen student civic engagement is crucial to the education of our students. Students must learn to make the connection between their responsibilities in their communities, their nation, and the world, both in terms of their own individual lives and careers and their ability to make judgments about their nation's role in the world.

Defining a Global Citizen

Once the three key understandings about the purpose of the program noted above were established, the faculty committee charged with program development moved on to the definition of what it would mean to be a global citizen and how this would translate into a workable undergraduate program. The program's archive of meeting minutes reveals that discussions started with the notion that today's students will live in a diverse, global, and interconnected world whether they want to or not, whether they necessarily know it or not. The questions that guided this part of the discussion included: What does it mean to ask of any student, regardless of major or intended career paths, that they become a global citizen? What is the difference between being a person who knows about non-U.S. cultures or languages and a global citizen? Is there a specific content, ideological perspective, or set of beliefs that are inherent in a citizen? What do students need in order to be able to determine, for themselves, their own relationship to the world? As discussions continued, support emerged for the belief that since all students will be affected by globalization, each student should be called upon to develop a stance as a global citizen that has a clear emphasis on the requirements of citizenship as opposed to global competencies. Rather than a tight, prescriptive, faculty-determined definition of what a global citizen should be, the faculty voted and chose to give students the perspective necessary to develop their own agency as responsible actors in the world, not just as observers or consumers of the rapid trends of globalization.

Program Design

The decision to allow students to develop their own understandings and definitions of a global citizen had

Table 1
Lehigh University Plan of Study for
the Global Citizenship Certificate program

Year	Course Requirements	Credits
Freshman Year - FALL	MLL/GCP 082 "Globalization & Cultures"	3
Freshman Year - FALL	GCP 087 "GC Practicum" trip preparation	1
Freshman Year - Winter (INTERSESSION BREAK)	10 day faculty led trip abroad	0
Freshman Year - SPRING	ENGL 007 "Global Literature"	3
Sophomore & Junior Years	ECO 001 "Principles of Economics" or other large introductory course	4
Sophomore & Junior Years	3 GCP Designated Courses	9-12
Senior Year - FALL or SPRING	GCP 387 Global Citizenship Senior Capstone Course	3-4
Any time	Study Abroad for a minimum of 6 weeks in a non-English speaking country	0
Each Semester	At least 2 co-curricular activities related to themes of "global" and/or "citizenship"	0

clear implications for the design of the program. Reproducing a new 21st century version of the old International Careers business major curriculum, which layered a veneer of cultural awareness over an essentially business or international relations model of the world, would not meet the program goal. Nor would program goals be satisfied by reforming existing disciplinary content, training for career choices, or focusing the program on the traditional area studies model in which students are expected to develop a deeper understanding of a particular region of the world. However, some existing university structures and procedures could contribute to meeting the goals of the new program. Faculties in all colleges of the university continually revise their curriculum, whether pre-professional or liberal arts, preparing students for integration into a global economy. Thus, students' majors and minors could be expected to provide specific skills and analytical tools for negotiating their career choices and abilities to access and use technologies.

The faculty committee concluded that there was no point in designing a specific program to deliver global citizenship, given the understanding that there is no major that is not, at some level, a global one – either because of the content of the discipline itself or because of the trajectory of the individual student after leaving university. The committee moved to a conception of the program as a "backpack" that any student should be able to assume regardless of his/her disciplinary home. This approach offered both exciting opportunities and tough challenges. On one hand, breaking the notion of global citizenship away from traditional academic disciplines opened possibilities for bringing ideas and interests from across all undergraduate disciplines together. While this is a commonly-stated goal in multidisciplinary studies, it is one that is very difficult to achieve in a research-intensive university setting in which faculty are disproportionately rewarded for

scholarly productivity in highly specialized fields rather than curricular innovation and cross-disciplinary pedagogy. The metaphor of a backpack suggested that each student would need to round out his/her major and extra-curricular/life experiences with tailored tools and perspectives, rather than participating in one program that narrowed exposure to just a few questions—such as economic or political questions—to the exclusion of others. Business or engineering students might need to fill their backpacks with classes and experiences in language or culture, while liberal arts students might need a greater awareness of the technical or business ramifications of globalization. The intellectual flexibility of a program not conceived as a new major/minor or concentration is that it allows students to deliberately tailor their educational experience around their concept of a global citizen.

The Challenge of an Interdisciplinary Approach

The greatest challenge of the backpack metaphor was that some students' curricula are so constrictive as to allow very little flexibility in their undergraduate career. For example, many Lehigh undergraduate engineering students have as few as 12 elective credits in their 4-year career. With such tight parameters, the typical approach of multidisciplinary program design, which is to simply add courses from a variety of disciplines, was impossible.

A key challenge facing the faculty committee charged with designing the program was to successfully overcome the territorial disputes of traditional academic disciplines. Faculty debates over the ownership of the intellectual content of global citizenship were fierce because the requirement that any student be able to tailor his/her backpack within the credit hours available ruled out the strategy of simply adding up enough requirements to satisfy a diverse faculty committee. The question of whether it was possible to be a global

citizen without, for example, speaking another language with proficiency, was one example of a heavily debated issue. If proficiency was needed, how would an engineer fit enough language into an already very constrictive curriculum? What if a student used every additional credit hour in language classes simply to become a fluent bigot? Is it enough to understand global financial trends with a smattering of language, or is some knowledge of cultural diversity necessary to transform a student from a student knowledgeable about the world into a global citizen?

Experiential and Co-curricular Learning

While the student “backpack” provided the solution to the challenge of program design, the solution to the challenge of the territorial debates between academic disciplines with the potential limitations and inflexibility of discipline-based curricula was to maximize experiential and co-curricular learning. The design for the GCP program integrates a structured engagement with the world through a number of practical and experiential components. This includes such commonplace experiences as study abroad, intersession trips abroad and summer opportunities to participate in nongovernmental organization (NGO) activities, lecture series, exchanges with foreign students and faculty, and the like. The design draws on understandings of service learning and other educational initiatives that seek to structure students’ activities in their communities in an explicit theoretical framework in order to give them the intellectual building blocks for a life of civic engagement.

The faculty committee charged with designing the program believed an emphasis on experiential, co-curricular learning in conjunction with some additional coursework was consistent with the core assumption that global citizenship cannot be achieved by merely learning things in a traditional classroom experience, but rather requires active engagement with the world. Again, like service learning or community-based civic engagement, students’ global engagement must begin with leaving the protective walls of the university. It is not the same to know something about another country from studying a third source such as books, the Internet, film, or music (although these can be valuable resources), as from *engaging* in another culture (Heath, 2000; Nussbaum, 2002). *Engaging* requires both experiencing viscerally the differences in cultures as well as thinking deliberately about one’s stance in relation to the differences. Indeed, the majority of students seem to understand the value of leaving the classroom and engaging in the world, from their local communities to the world beyond the U.S. borders. For example, in a poll conducted by the *Chronicle of*

Higher Education (2004), 57% of the entering first year university students thought that promoting international understanding by encouraging students to study in other countries was either very important or important.

Yet the percentage of students who actually study abroad is much lower than 57% nationwide (*Chronicle of Higher Education*, 2004). There are several reasons for the disparity between student beliefs and reality. One barrier is the additional financial burden of studying abroad. Others include fear of the unknown, lack of confidence, and the lure of on-campus social life—especially in students’ junior year when most students consider study abroad. Even for students who believe that international travel and study are important, it is easy to choose to stay in the familiar environment of their friends and professors in their junior and senior years, especially when they have positions of leadership in their fraternities/sororities or other extra-curricular activities. Often, it is just too difficult to imagine taking the huge step to immerse oneself in another culture if one’s friends do not also value it. In order to help students build the confidence and develop a network of internationally-interested friends beginning from their freshman year, a third foundation stone for the GCP was decided upon—that of a heavily-subsidized intersession trip for first year GCP students (GCP students contribute \$500 toward the cost of the first-year trip abroad, while the University contributes the remainder, approximately \$2500 - \$2700 per students).

Focused Travel Abroad

In order to prepare for the trip abroad, the first year GCP students take a specially-designed course in the fall semester named *Globalization and Cultures* as well as a weekly orientation led by the faculty trip leader who is an expert in the politics and culture of the destination country. GCP students’ first year is rounded out with a spring semester intensive writing course, taught by an English Teaching Fellow who also participates in the inter-session trip. The spring semester writing intensive course focuses on the students’ trip experiences and the literary traditions of the country. Thus, the design of the first year of the GCP was constructed not only to incorporate the best practices in writing-intensive courses designed to foster critical thinking but also to build a social network of students interested in GCP that will provide the peer support for future, more in-depth study abroad.

Faculty Involvement in Course Development

The final challenge for the program design was to involve the faculty in course development to provide as wide a choice as possible of relevant courses from which students could choose to fill their backpacks.

Starting in the winter of 2004 through 2007, an annual faculty seminar, set up using Mellon Foundation funding, provided up to 15 faculty members from across the University an opportunity to participate in a semester-long structured discussion of global citizen themes. Each faculty member applied to participate in the seminar by agreeing to either create a new course or substantially revise an existing course in his/her departmental curriculum by incorporating the global citizenship themes chosen by the faculty program design committee. The multidisciplinary faculty seminar is intended to both spread faculty participation in the program as well as inspire the creation of new courses throughout the curriculum each year. This not only provides courses woven together by a common intellectual purpose but also transforms the curriculum over time for all students.

Challenges of Assessment

Once the program design and aspects of its implementation were finalized by the faculty committee, attention turned to the issue of program assessment. Baseline information that would assist in documenting the program as it evolved and guiding further program (re)design would also assist other institutions struggling with the same tasks of integrating assessment to new program implementation. A review of the literature on program evaluation stressed the importance of integrated assessment.

Colby et al. (2003) noted that effective programs build an assessment plan into the original design in order to provide the mechanism for clarifying program goals, reviewing progress toward those goals, and identifying components in the program that need improvement. Evaluation can give the insight and information needed for designing better programs (National Endowment of the Arts [NEA], 1993). Schuh and Upcraft (2001) pointed out that a well-designed assessment strategy is the best way to guarantee institutional commitment to high quality education and proper program development:

National pressures on higher education institutions to demonstrate their effectiveness are continuing to mount. State legislatures and governors, the federal government, the general public, and students and their families are asking tough questions. What is your college's contribution to learning? Do your graduates know what you think they know, and can they do what your degrees imply? (p.9)

Student academic success can be measured by proper assessment models. It should be the responsibility of academic leaders or program directors to design and conduct appropriate

evaluations (Schuh & Upcraft, 2001). Yet, for most universities, needs assessment is a challenge. Current assessments conducted in most universities are inadequate, and they rarely occur before new programs are launched (Schuh & Upcraft, 2001). Furthermore, program officers and decision makers hardly ever look at the evaluation's intended use prior to data collection (Patton, 1997). American colleges and universities focusing on civic and global programs rarely measure changes in attitude or measure competencies in terms of linguistic ability or cultural abilities (Grundinski-Hall, 2007).

Universities and colleges are reluctant to commit the resources necessary to adequately assess existing programs, and additional challenges are presented by programs such as the GCP. Given how difficult it is to broker the faculty compromises that are necessary to overcome disciplinary territorial battles, it is easier to focus faculty attention on the intellectual excitement of the program's goals than point the discussion toward often difficult questions of assessment. Moreover, the faculty committee that designed the GCP deliberately rejected a design that focuses on skill development or acquisition of specialized knowledge, adopting instead the much less crisp goal of fostering students' ability to develop their own stance as engaged citizens of the world. Not surprisingly, as Colby et al. (2003) explained, civic education is seldom assessed because success is so difficult to define and therefore measure. Yet the authors assert that a proper assessment model would not only strengthen such programs but also enlighten faculty, who should aim to survey substantive knowledge, communication skills, and aspects of analytical or critical thinking.

Program assessment can take many forms and can be equally successful with a qualitative or quantitative model. The decision will depend on the evaluation's purpose and audience (Colby et al., 2003; Patton, 1997, 2002). Evaluation conducted both formally and informally will allow for opportunities to analyze each component of the program. Yet what is essential is to apply methods that best suit the process through which the program operates, the nature of student's experiences, and the changes that students will undergo (Brisolara, 1998; Yin & Kaftarian, 1997). It is important to find out what the expectations of intended users are and negotiate a shared understanding of realistic, intended use. Schuh and Upcraft (2001) argued that a good assessment model starts with the institution or program's core mission and identifies the factors, conditions, resources, services, and learning opportunities that students need in order to meet the educational goals.

Existing Assessment Models

What assessment models are available for programs such as Lehigh's GCP? Because both civic engagement and globalization are the focus of so much national attention, leading many colleges and universities to reform their curricula in the light of national debates, it is not surprising that some assessment templates are available. For example, the Carnegie Corporation (2003) that has funded important pilot programs in civic engagement nationally advocates using longitudinal studies that examine students' attitudes and civic engagement after graduating. Similarly, a Pew Charitable Trust initiative funded researchers at George Mason University developing "youth civic engagement indicators" to measure the levels and types of student participation in public life (Andolina et al., 2003). The goal of this index, consisting of 19 indicators, is to measure behavior before and after the program as a means to test the success of the venture.

Similar efforts to assess internationalization programs can be found. In 2000, the American Council on Education (ACE) began a project that surveyed three specific audiences in U.S. postsecondary education with the goal of analyzing changing internationalization efforts in colleges and universities nationwide (Siaya & Haywood, 2003). This project, funded by the Ford Foundation, sampled 752 U.S. colleges and universities, 1,027 undergraduate faculty, and 1,290 undergraduate students and focused, at the institutional level, on internationalizing undergraduate experiences, the practices and policies put in place to support internationalization efforts, foreign language requirements, and student participation in international courses, travel experience, and personal interests.

At present, no Lehigh specific survey exists which focuses on the topics of civic, global or international education. Every year, however, Lehigh University administers the *National Survey of Student Engagement* to first year students. Although the survey is not specific to global, civic, and international issues, some questions are relevant. For example, the survey asks about participation in a community-based project; how often students have had serious conversations with students of different race or ethnicity than their own; whether student plan to take a foreign language course or study abroad before they graduate; and for student perceptions of the extent to which their institution encourages contact among students from different economic, social, and racial or ethnic backgrounds. Although this survey is intended to encompass all aspects of college experience, questions about experiences with student government, ethnic studies, women's studies, cultural workshops, and study abroad could be relevant to the development of a global citizen.

Finally, Lehigh students are asked to complete the *Senior Survey* focusing on their undergraduate educational experience. A subset of questions measure students' understanding of moral and ethical issues, including awareness of social problems; sensitivity to people of different races, nations, and religions; the relevance of historical/cultural/philosophical perspectives; appreciation of art, literature, music, drama (although not specifically of other cultures); and reading/speaking a foreign language.

A Tool for Comparing Pre and Post GCP Skills, Attitudes, and Knowledge

Assessment models often emerge out of a messier process than simply starting with the core mission and devising a tool tailored to the particular educational goals of the program or even borrowing from similar templates available nationwide. The fundamental problem for Lehigh's GCP was that the faculty group that designed the core educational mission did not view its charge as including the development of an assessment tool. In fact, the university admitted the first class of 26 entering GCP students in 2004 and then, at the insistence of the Provost, scrambled over the summer, under the leadership of a faculty member who had not participated in the original program development faculty committee, to devise an assessment tool to administer at the beginning of the academic year in August 2004.

None of the national templates for measuring civic engagement or globalization, nor the surveys currently used at Lehigh, were examined with an eye to how they might be adapted to the Global Citizenship program. The one national instrument specifically designed to measure "global citizenship," created by the AAC&U, was implicitly rejected by the faculty committee. Since there is no accepted definition of the term "global citizenship," it is not surprising that no consensus exists concerning the design of the program. According to the AAC&U, a global citizen is one who has a "sophisticated understanding of the increasingly interconnected but unequal world, still plagued by violent conflicts, economic deprivation, and brutal inequities at home and abroad" (AAC&U, 2002). Although the Lehigh faculty committee agreed on the description of the world, the consensus was that the definition of the term global citizen focused too exclusively on the acquisition of knowledge about the world rather than a developed stance as an individual with responsibilities in that world.

The committee consulted with the then university's Director of International Students & Scholars who had developed an assessment model for "global competency," derived from research using educators and transnational corporation human resource managers

(Hunter, 2004). According to Hunter (2004), global competence is “having an open mind while actively seeking to understand cultural norms and expectations of others, and leveraging this gained knowledge to interact, communicate and work effectively outside one’s environment” (p. 10). The only assessment tool developed to gather base-line data from the first cohort of 26 GCP participants drew heavily on Hunter’s model while borrowing from questions developed in the Ford Foundation *Internationalizing the Curriculum* (Siaya and Haywood, 2003). Although “competency” is not part of the mission of the GCP, it does encompass several of the key ideas specific to knowledge, skills, and attitudes (Hunter, 2004).

Consistent with the faculty committee’s vision, the definition of Hunter’s (2004) global competence focuses on gaining knowledge, perspectives, and skills that a student would bring to bear on situational decision making rather than decision making based on previous thought or conjecture. According to Hunter (2004), globally competent citizens possess certain types of knowledge, skills, and attitudes that others do not. Based on the results of his survey, Hunter found that the kind of knowledge that marks a global citizen includes an understanding of one’s own cultural norms and expectations and the cultural norms and expectations of others, an understanding of the concept of globalization, knowledge of current world events, and knowledge of world history. The kinds of skills that would distinguish a globally competent student include successful participation in a project-oriented academic or vocational experience with people from other cultures and traditions as well as the ability to access intercultural performance in social or business settings, to live outside one’s own culture, to identify cultural differences, to collaborate across cultures, and to participate effectively in social and business settings anywhere in the world. Finally, a global citizen recognizes that one’s own world view is not universal, and she has a willingness to step outside of her own culture and experience life as ‘the other,’ to take risks in pursuit of cross-cultural learning and personal development, to have an openness to new experiences including those that could be emotionally challenging, to cope with different cultures and attitudes, and to be non-judgmental about these differences and celebrate diversity. Thus, while the instrument developed to gather the baseline data for the program did not arise out of the faculty committee that devised the program, it was, in general, consistent with the faculty intent.

Ongoing Challenges in Developing Assessment Tools

The obvious and fundamental challenge for the Lehigh GCP is defining the term global citizenship. The original intent of the program is to provide students

with the tools—information, experiences, and perspectives—necessary to think deliberately about their own responsibilities and stances as citizens in a globalized world. There are several problems with this initial purpose. While it is possible to operationalize some of the characteristics of a global citizen (for example, foreign language proficiency, knowledge of other cultures, and habits such as reading non-U.S. sources), measuring a student’s evolving definition of his/her citizenship is both highly subjective and easily contested. We can imagine a student who rates himself highly on awareness, cultural sensitivity, and global responsibility, and yet others would characterize him as naïve, arrogant, self-absorbed or simply ignorant. Measuring student’s self-perceptions is not without value, but the inferences we can draw only relate to how students view their educational experience, not whether their education produced an externally-defined intended outcome. While Hunter’s (2004) definition of global competency is an improvement over the AAC&U definition of global citizenship in that it includes skill-based and attitudinal measures to a basic knowledge-based set of criteria, more work on operationalizing the intent of the program is necessary.

Another consideration in devising an adequate definition and measurable outcomes of the construct of a global citizen is the question of whether a “stance in the world” is a non-verifiable goal. Is it possible for someone *not* to have a stance in and toward the world? The GCP faculty committee did not define the program outcomes as a specific set of beliefs or attitudes, much less an ideological or political position on specific issues. Yet, the intent of the program is not that students simply gain knowledge or awareness but that students deliberately explore their own responsibilities in relation to specific issues in the world. Like a self-definition of citizenship, it is possible to imagine someone whose exposure to complicated issues and thorny world problems is to retreat to a stance that many would not view as a successful outcome—for example, jingoism or a fatalistic religious perspective. These are stances in the world, and yet many of us would not feel comfortable citing them as measures of success.

A further aspect of assessing the program is how GCP students compare in relation to some standard. Do Lehigh GCP students measure higher on selected indicators than students in some other group? It is tempting to select a subset of questions from surveys already administered to all Lehigh students in the hope of demonstrating some measurable difference in outcomes between GCP students and the general Lehigh population. What the program might sacrifice in learning about specific program outcomes it might gain in having a more robust comparison of the impact of the program on a select number of students. A snapshot

comparison of GCP students with a larger population, either Lehigh students generally or students from across the country on campuses administering the same instruments or subset of questions, would deepen the knowledge of the real effects of the GCP program versus the intellectual growth and maturity and awareness that might result from four years of study. The ability to compare GCP students to other populations could highlight potential differences, for example, between GCP students and liberal arts versus pre-professional undergraduate majors, as well as indicate the relative importance of other factors such as gender, socio-economic group, or region.

An alternative view is that a more accurate measure of the impact of the program may be a longitudinal study of GCP students after they graduate. This is based on the understanding that 'citizenship' is a dynamic identity and the program's mission is to provide students with the tools to continue to develop their individual definitions of their roles as citizens in the world—roles that surely will change over time as individuals' lives move through the various phases of adulthood. While program administrators would give up some of the potentially interesting contrasts that might be yielded by selecting a subset of questions administered broadly to students nationwide, they could develop more finely tuned instruments with more open-ended questions to administer to the small group of GCP students at key points in their lives.

The considerations above are both theoretical and practical. Any assessment strategy will be a compromise between the ideal instrument tailored to the specific mission of a program and the institutional resources that can be reasonably deployed for this purpose. To some degree, the choice of an assessment tool will be driven as much by institutional leadership and culture as by faculty design or student experiences.

There is another challenge to developing an appropriate and adequate assessment strategy that is rarely considered. All of the national justification for funding either civic engagement or global citizen initiatives rests on the assumption that colleges and universities are uniquely situated to create future generations of citizens. Yet, some research suggests that colleges and universities do not necessarily play such a pivotal role in shaping student's long term civic engagement, social responsibility, or attitudes/beliefs; rather, students who were already inclined toward social activism, volunteerism, and political engagement tend to find their interests reinforced by their college experiences. Sax (2000), for example, showed not only that students self-select into majors that will strengthen their predispositions toward these kinds of attitudes and behaviors but also that some majors lead to a real decline in attitudes, beliefs, and behaviors associated with civic engagement. In the end, what the GCP may

be doing is simply better equipping students on a path that they already were inclined to take. This is not a small accomplishment; however, it is not the same outcome as creating a larger or more diverse population of global citizens for the future.

Conclusion

At this time, the full four years of the Global Citizen Program structure is now officially in place, consisting of a mix of traditional on-campus courses generated by participants in the annual faculty seminar and co-curricular/experiential opportunities ranging from study abroad, flexible practicums with domestic and international NGOs, participation in the range of internationally-related activities, and a senior capstone experience. The inter-session trip for up to 30 students each year now rests on a sound university budget model, and a number of sites for this activity have been developed. The first inter-session trip in 2004 took half of the students to Santiago, Chile and half to Hong Kong. In 2005 half of the students traveled to Prague, Czech Republic and half to Shanghai. In 2006 the first-year group traveled together to Cape Town, South Africa. In 2007 one group of first-year students traveled to New Delhi and Hyderabad, India. First-year students (2008) are now preparing for their inter-session trip to Accra, Ghana.

At a basic level, much of this work has been political—re-brokering a series of compromises in each of the three undergraduate college committees, passing the university-wide committee, and winning a majority vote in the university faculty meeting (a committee of the whole). The difficulties inherent in such a political process are made all the harder when faculty are also asked to debate, design, and implement a solid assessment strategy alongside the creation of a new program. For the faculty who have been most involved to date, the cornerstone of the GCP is its emphasis on citizenship defined as a vague but important "stance in the world," and any assessment model that is perceived as narrowing that emphasis to outcomes that are more easily measured runs the risk of losing important faculty support. The political issues, in addition to the methodological challenges inherent in assessment debate, make development of an adequate assessment strategy for Lehigh University's GCP a complicated puzzle that will require administrative support, skilled leadership, and more than a good dose of patience.

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Linking Communalism to Achievement Correlates for Black and White Undergraduates

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This study examined relationships between home-based communal activities and beliefs and student reports of various achievement correlates with 290 black and white undergraduates. MANOVA procedures examined differences in self-esteem, self-efficacy, identified motivation, motivation to know, and amotivation and scores on Home Communalism Measure subscales as a function of race and other demographic variables. No significant race differences emerged for any of the communalism or motivation subscales. Subsequent regression analyses found that reports of communalism were predictive of students' self-efficacy, self-esteem, identified motivation, motivation to know and amotivation scores. Implications and limitations of findings are discussed.

The achievement of undergraduate students in the U.S. continues to be a heavily researched topic among education researchers. A good deal of this concern results from the perceived academic achievement disparities found between ethnic minority and white students (Brower & Ketterhagen, 2004; van Laar, 2000). Though the past twenty years have witnessed a significant increase in the number of ethnic minority students enrolling and graduating from undergraduate and graduate/professional degree programs within the U.S. (Cokley, 2003), their expected and actual academic performance has been observed at significantly lower levels than their white counterparts.

To explain this phenomenon, some researchers have subscribed to genetic/biological frameworks (Rushton & Jensen, 2005). Others have employed more comprehensive frameworks to investigate black college students' academic outcomes and their psychological and/or social/contextual antecedents (Garcia-Coll, et al., 1996; Spencer, 1995). Emerging from these frameworks are data advancing the argument that undergraduate performance is linked to several important environmental and familial factors (Cokley, 2003; Neville, Heppner, Ji, & Thye, 2004). Several empirical studies, for example, have noted the importance of various psychological, familial/contextual, and interpersonal factors which promote academic self-efficacy and motivation for black undergraduates as well as those factors that may hinder achievement. Some of these factors include self-efficacy, stereotype threat, institutional attachment, and specific culturally-derived factors such as spirituality and religiosity (Constantine, Miville, Warren, Gainor, & Lewis-Coles, 2006; Lewis-Coles, Lyriss, & Constantine, 2006; Okech & Harrington, 2002; Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003; Steele, 1997; Walker & Dixon, 2002). The literature also contains studies detailing the associations between

familial characteristics and achievement-related outcomes for black college students (Hwang, Echols, & Vrongistinos, 2001).

While several person- and context-based variables have been investigated to explain variance in black college student performance, it appears that factors apposite to issues of race (i.e., racial identity, race socialization, racial discrimination) have had a stronghold on the psychological and educational literatures detailing such performance (Pillay, 2005; Sanchez & Carter, 2005; Sellers, Rowley, Chavous, Shelton, & Smith, 1997). Much of this literature contains data illustrating the development and progression of black racial identity and how it, along with the race-based experiences of this population, are associated with college student performance and its various psychological precursors (Mutisya & Ross, 2005; Sellers, et al., 2003; Swim et al., 2003).

Lagging behind this line of research, however, is an understanding of the culturally-premised, person- and context-centered variables that may also account for variance in black college student performance. While several theoretical frameworks illustrate the presence of specific cultural values permeating the socialization experiences of African Americans (Boykin, 1986; Garcia-Coll, et al., 1996), little research has been conducted to determine whether these cultural values are associated with achievement outcomes and their antecedents for this population. Thus, a greater research concentration on the cultural factors permeating black college students' lives and their associations with their academic experiences is warranted.

It is also important to determine whether the cultural values said to exist within black socialization experiences are actually endemic to this population. Given research findings suggesting that some cultural values found throughout black socialization practices

are also demonstrated and preferred by white populations (Oyserman, Coon, & Kemmelmeier, 2002; Tyler, et al., 2006), it is important to determine whether the cultural values and practices deemed to be uniquely black are, in fact, reported by white populations. Whether these cultural values are linked with the psychological antecedents of undergraduates' academic performance is also important to discern.

The purpose of this study, therefore, is to: a) examine the reports of black and white college students on a scale measuring the salience of communalism in their lives and b) determine whether these reports are linked to college student's academic self-efficacy, self-esteem, and motivation. While academic performance is the most widely studied index of success at all levels of schooling, it is equally important to examine the psychological antecedents of academic performance, including self-esteem, self-efficacy and academic motivation, especially among college student populations. In addition, many psychologists discussing the role of culture in cognition (Gordon & Armour-Thomas, 1991; Rogoff, 2003) have suggested that cultural values influence not only the behaviors individuals exhibit (i.e., academic performance) but also the psychological factors preceding such behaviors. Thus, following a discussion of the cultural values found in mainstream society and among black and white populations, an examination of whether reports of communal values and practices are 1) differentiated by demographic factors (i.e., race) and 2) associated with college students' reports of efficacy, esteem, and motivation will occur.

Institutions of Higher Learning and Culture

Many education researchers have championed the notion that, by and large, public schools are failing ethnic minority students by not fully recognizing and building upon the cultural capital students are bringing to formal learning contexts (Boykin & Ellison, 1995; Webb-Johnson, 2002). These arguments have recently been extended to the university campus as well. Notably, some research has argued that the university structure in the U.S. serves an implicit socialization function towards particular mainstream cultural values such as individualism and competition (Pei, 2002; Sampson, 1977; Spence, 1985). In order for students to achieve in institutions of higher learning, it is often incumbent for them to adopt a strong orientation towards working on their own and competing against others (Constantine & Sue, 2006; Pai & Adler, 1997; Strickland, 2000). These cultural values—individualism and competition—inform the academic and social institutions that all students, irrespective of developmental level, have to endure throughout their matriculation (Boykin, 1986) and are especially

prevalent during postsecondary education. Some empirical research supports this claim (Gaines, et al., 1997; Oyserman, Coon, & Kemmelmeier, 1999).

Black College Students and Cultural Values

Boykin's Triple Quandary framework (1986) articulates nine conceptually distinct, integrity-based (those factors situated in the lived and purposeful experiences of a given population) cultural values and subsequent behavioral patterns said to permeate the socialization activities of African Americans. One cultural value that has been examined with college students is communalism (Jagers, 1988; Tyler, et al., under review). The basis for the communalism construct is found in the work of Boykin, Jagers, Ellison, & Albury (1997), who argue that, among persons of African descent, there is an implicit doctrine of interdependence and extended family system promotion whereby one's obligation extends beyond (but does not exclude) family to other social relations. Overall, there is a salient focus on the well-being of others, irrespective of the other person being an immediate family member. While some research has used the term collectivism and cooperation to discuss communalism (Gaines, et al., 1997; Oyserman et al., 2002; Triandis, 2001), Moemeka (1998) makes a case for conceptualizing communalism as a construct that informs cooperation and collectivism. Thus, the current study will employ a new measure to discern the presence of communal practices and attitudes among black and white college students.

One major assumption regarding mainstream cultural values, especially individualism and competition, is that most European Americans adhere to such values in their day-to-day lives, while African Americans are purported to endorse communal values (Boykin, 1986; Boykin & Ellison, 1995; Moemeka, 1998). Yet, there has been little research to determine whether black and white college students actually differ with respect to reported levels of communalism-based beliefs and corresponding behavioral patterns. In fact, some work investigating proxies of the communalism construct, namely collectivism and family cohesion, reported no significant difference between black and white students' scores of collectivism, while in other cases African Americans reported significantly higher levels of individualism than did their white college student counterparts while maintaining equal levels of reported collectivism (Gaines, et al., 1997; Oyserman et al., 2002; Tyler et al., 2006). For example, Tyler et al. (2006) uncovered that the learning and working behaviors found in both African and white households—as reported by parents of elementary school level children—were high in communalism.

In summation, no published studies to date have employed a theoretically grounded, empirically sound measure of communalism to examine its association with academically-aligned psychological variables such as self-esteem, self-efficacy, and motivation, particularly for African Americans and white undergraduates. Moreover, given the finding that European Americans also tend to utilize such culturally-aligned behaviors (Gaines, et al., 1997; Oyserman et al., 2002; Tyler et al., 2006), it is important to understand whether such associations between cultural value endorsement and academically related psychological variables exist for white undergraduates as well.

The major research questions informing the current study ask: 1) whether there are significant differences in the communalism reports between black and white college students and 2) whether communalism attitudes and practices are predictive of college students' self-esteem, self-efficacy, and academic motivation.

Methods

Participants

Participants were 290 black ($N = 165$) and white ($N = 125$) undergraduates from one historically black research university located on the East Coast ($N = 100$), one historically black teaching university located in the South (20%, $N = 63$), one community/junior college (9%, $N = 28$) and one Predominantly White Institution (29%, $N = 90$), both located in the South. Average age was 20.68 ($SD = 4.06$) years and most undergraduates were female (71.2%) and college sophomores (40%, $N = 125$). The response rate was 100%. This sample size would also provide sufficient power to detect a moderate to large effect size at $\alpha = .05$ (Cohen, 1969) in examining the differences between black and white students' reports of the variables in question (i.e., HCM scores, self-esteem, self-efficacy and college adjustment) (Tabachnick & Fidell, 1996).

Instrumentation

Home communalism measure (HCM). The Home Communalism Measure (Boykin & Bailey, 2000) assesses perceived levels of communalism beliefs and activities of family members. The HCM consists of 20 items arranged on a Likert-type scale ranging from 1 (*not at all*) to 4 (*very much*), with higher scores indicating greater levels of home communalism. A sample item is "My family usually does things together. We do things that everyone likes to do. Usually, no one is left out. Is your family like this?" Reliability of the HCM has been reported as good ($\alpha = .85$), and criterion validity for the measure has been established in a

sample of 89 black children (Boykin & Bailey, 2000). Tyler and colleagues (accepted for publication) performed a Principal Components Analysis on the HCM. Scree plot examination, along with derived eigenvalues, determined the presence of three factors accounting for 57% of the variance in HCM scores. The communalism factors were called "family importance," "family cohesion," and "sharing." Family importance reflected the values students held towards their families, while family cohesion reflected the behavioral orientations typical throughout family socialization (i.e., helping and doing things together). The sharing factor reflected specific sharing and interdependence-based factors. Reliability indices for the three subscales of the HCM ranged from .71-.78 in the current study.

Self-esteem questionnaire (SEQ). The Global subscale of the SEQ (DuBois, Felner, Brand, Phillips, & Lease, 1996) was used to measure students' reported levels of self-esteem. The global subscale of the SEQ is a generalized indicator of self-worth and consists of eight items on a Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with four items reverse-scored in order to avoid response sets. A sample item is "I am as good a person as I want to be." DuBois et al. (1996) found convergent and discriminant validity for the instrument as a self-report measure, and obtained Cronbach's alphas ranging from .81 to .92 over a 2-week period. The alpha coefficient for the SEQ with the current sample was .79.

General self-efficacy scale. The global subscale of the General Self-Efficacy Scale (GS-ES; Sherer & Maddux, 1982) was used to measure students' ratings of self-efficacy. The GS-ES includes 17 Likert-scale items ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with higher scores reflecting higher levels of perceived self-efficacy. A sample item is "When I make plans, I am certain I can make them work." Sherer and Maddux (1982) reported construct validity of the GS-ES and adequate reliability estimates in its initial validation. Cronbach's alpha for the GS-ES in the current study was .81.

Academic motivation scale: College version. The Academic Motivation Scale: College Version (AMS: College Version; Vallerand et al., 1992) is a 28-item self-report measure used to assess students' intrinsic, extrinsic, and amotivation. The AMS has seven different subscales, each of which corresponds to a different form of motivation. The intrinsic domain contains three subscales: motivation to know (performing an activity for the satisfaction that one experiences while learning, exploring, or trying something new), motivation to accomplish (engaging in an activity for the personal satisfaction of accomplishing a task or creating something) and motivation to experience stimulation (engaging in an activity to experience sensory pleasure or excitement).

Table 1
Means, Standard Deviations, Alpha Coefficients, and
Bi-variate Correlations for Continuous Variables.

Variables	M	SD	α	1	2	3	4	5	6	7	8
Importance (1)	3.35	.58	.74	1	.58**	.50**	.31**	.36**	.13	.32**	-.31**
Cohesion (2)	3.18	.57	.78		1	.59**	.08	.07	.12	.02	.04
Sharing (3)	3.15	.56	.71			1	.08	.04	.03	.15	.09
Self-esteem (4)	3.46	.86	.79				1	.67**	.02	.56**	-.46**
Self-efficacy (5)	3.40	.64	.81					1	.36**	.51**	-.71**
Intrinsic Motivation (6)	4.93	1.70	.89						1	.18	-.26**
Extrinsic Motivation (7)	5.07	1.60	.90							1	-.37**
Amotivation (8)	3.29	1.99	.84								1

The extrinsic domain contains three subscales: external regulation (behavior is regulated through external means such as rewards and constraints), interjected regulation (behavior is regulated by the expectations of others), and identified motivation (behavior that is internalized because of external factors). Amotivation has its own subscale and is described as behaviors that do not facilitate the achievement of a specific goal.

Scale responses are recorded using a Likert scale ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*). The motivation to know subscale along with the identified regulation and amotivation subscales were chosen for the current sample in accordance with Vallerand & Bissonnette's (1992) suggestion that these motivation factors are related to important academic outcomes. Sample items for each motivation domain include: "Because I experience pleasure and satisfaction while learning new things" (motivation to know/intrinsic), "In order to obtain a more prestigious job later on" (identified regulation/extrinsic), and "Honestly, I don't know; I really feel that I am wasting my time in school" (amotivation). Vallerand et al. (1992) reported Cronbach's alphas ranging from .83 to .86 for the subscales and test-retest reliability estimates over a one-month period ranging from .71 to .83. Concurrent and criterion validity of the measure were determined using a sample of 217 Canadian students (Vallerand et al., 1992). Alpha reliability for the intrinsic, extrinsic, and amotivation subscales in the current study was .90, .89, and .86, respectively.

Procedures

Participants were recruited from a variety of college classrooms across the four institutions. Six trained research assistants distributed the survey materials in introductory psychology and related liberal arts classes across the four universities (i.e., Black Studies, History) using standardized administration procedures (including

informed consent procedures, provision of surveys and pencils). From administration and explanation of instructions to survey collection, the data collection process took an hour (i.e., one class period) to complete. Flash drives were raffled to encourage participation in the research.

Results

Descriptive Statistics

Table 1 presents means, standard deviations, and alpha coefficients among the variables investigated. To examine the influence between various demographic variables and reports of communalism via the three identified subscales, a multivariate analysis of variance (MANOVA) was computed and revealed no significant differences in each of the three communalism subscales as a function of race/ethnicity [$F(1, 189) = .91, p > .05, \eta^2 = .03$], class rank [$F(3, 189) = .47, p > .05, \eta^2 = .02$], gender [$F(1, 189) = 2.02, p > .05, \eta^2 = .06$] or type of university [$F(3, 189) = 1.16, p > .05, \eta^2 = .04$]. In addition, there were no significant main or interaction effects of these demographic variables on self-esteem, self-efficacy, intrinsic or extrinsic motivation and amotivation. As a result, these variables were excluded from regression analyses.

To examine the predictive nature of the communalism subscales reports on self-efficacy, self-esteem, and motivation, multiple regression analyses were computed. Nominal demographic variables were dummy-coded to facilitate prediction of criterion variable with a categorical rather than continuous variable. To control for family-wise error associated with the multiple regression analyses used with the same data, a Bonferroni statistic was computed, thus lowering the conventional alpha coefficient used to determine statistical significance and thus lowering the likelihood of Type I error. The statistic yielded was $(.05 = \alpha \times 5 = \text{number of regression analyses}) .025$.

Self-efficacy findings. For the self-efficacy dependent variable, regression analyses revealed that the model was significant [$F(9, 188) = 5.96, p < .01$], accounting for 16% of the variance in self-efficacy. Age ($\beta = .27, t = 3.8, p < .001$), family importance ($\beta = .44, t = 5.1, p < .001$), and sharing ($\beta = -.21, t = -2.4, p < .02$) emerged as significant predictors of self-efficacy.

Self-esteem findings. For the self-esteem dependent variable, regression analyses revealed that the model was significant [$F(9, 188) = 2.58, p < .01$], accounting for 12% of the variance in self-esteem. Family importance ($\beta = .31, t = 3.3, p < .01$) emerged as a significant predictor of self-esteem.

Motivation findings. For the intrinsic motivation dependent variable (motivation to know), regression analyses revealed that the model was not significant [$F(9, 189) = 1.37, p = .20$]. Thus, no further examination of the standard beta coefficients for each predictor variable occurred. For the extrinsic motivation dependent variable (identified motivation), regression analyses revealed that the model was significant [$F(9, 189) = 2.57, p < .01$], accounting for 12% of the variance in extrinsic motivation. Family importance ($\beta = .36, t = 3.8, p < .01$) and family cohesion ($\beta = -.23, t = -2.8, p < .01$) emerged as significant predictors of extrinsic motivation. For the amotivation dependent variable, regression analyses revealed that the model was significant [$F(9, 189) = 6.29, p < .01$], accounting for 24% of the variance in amotivation. Age ($\beta = -.18, t = -2.6, p < .01$), family importance ($\beta = -.51, t = -6.00, p < .01$), family cohesion ($\beta = .21, t = 2.29, p < .02$), and sharing ($\beta = .28, t = 3.34, p < .01$) emerged as significant predictors.

Discussion

This study had one major focus: to determine the relationships between the identified factors within the HCM and perceived psychological antecedents of postsecondary academic achievement, namely self-esteem, self-efficacy, and motivation. Multivariate analysis of variance findings revealed no significant differences in the three communalism subscales due to demographic variables such as race/ethnicity, class rank, gender, or university. Similar to findings from previous studies where no significant differences in communal and like variable reports emerged as a function of race/ethnicity of students (Gaines, et al., 1997; Oyserman, et al., 2002), the means for the black and white family importance, family cohesion, and sharing dependent variable reports were 3.31 and 3.41, 3.16 and 3.20, and 3.13 and 3.13, respectively. As a result, these demographic variables were excluded from future analyses, and several regression analyses were computed to determine the predictive nature of the three communalism subscales (family importance, family

cohesion and sharing) on various, albeit inter-related antecedents of academic performance, namely self-efficacy, self-esteem, and motivation including intrinsic, extrinsic, and amotivation. Regression analyses contained the full sample of 290 black and white undergraduates as there were no significant differences in home-based communal activities—the primary predictor of interest—as a function of race.

For the entire sample, family importance was predictive of self-esteem, self-efficacy, extrinsic motivation, and amotivation. Here, these positive associations suggest that students' families, regardless of racial background, were significant to their feelings of efficacy, personal self-esteem, and their motivation to do well in college. These findings are consistent with the literature suggesting that many students' perceptions of what their families think of them are important to what they consider themselves able to do (Walker & Dixon, 2002; Walker & Satterwhite, 2002). The fact that students' perceptions of their family's importance were negatively linked to amotivation scores also supports the claim that college students' families are a primary motivational force for college students (Tinto, 2006).

Reports of family cohesion and at-home sharing, however, were linked to lower self-efficacy and extrinsic motivation and higher levels of amotivation. Here, it appears that the degree to which students actually come from families where communal themes such as sharing and interdependence are salient is linked to lower levels of extrinsic motivation and self-efficacy. It is plausible that, given the individualistic and competitive values that characterize the college campus and most mainstream institutions (Boykin, 1986; Constantine & Sue, 2006), students coming from home environments largely reflective of communalism report feelings of inefficaciousness and lower motivation. Also, these same students are less motivated in the college campus, as evidenced in the higher amotivation scores.

Several themes, however, can be gleaned from these findings. First, it is important to note the situational nature of students' reported cultural values. While white culture has long been viewed as synonymous with and reflective of mainstream cultural themes such as individualism and competition (Gaines, et al., 1997; Johnson, 2003; Oyserman, et al. 2002; Spence, 1985; Tyler, et al., 2006), we find in this study that European Americans tend to endorse communalism as much as black students. This finding is supported in the literature (Gaines, et al., 1997; Oyserman, et al., 2002). Such a finding challenges education researchers to more fully consider the role of context and how this may influence individuals' culturally-situated behaviors (Mehan, 1998; Rogoff, 2003). That is, it appears erroneous now to assume that race is synonymous with

communalism endorsement, and, thus, researchers must begin to examine the situations and contexts in which communal values are expected, accepted, and exhibited (APA, 2003). To more effectively accommodate students, college and university administrators should begin to more critically examine the types of culturally-aligned behavioral patterns of incoming freshmen and other undergraduates in order to provide on-campus and perhaps in-class programming and activities that would otherwise facilitate students' adjustment to campus life, primarily by making it feel more like the communal experiences they bring with them to campus.

Limitations and Future Research

Though the student representation in this study extends external validity, particularly by recruiting undergraduates from all grade levels and across four different universities, several limitations exist. To begin, results are limited by the correlational nature of the data analysis. Therefore, researchers are cautioned to limit their interpretations to associations rather than causal relationships. Future research should also look to include more male college students. Though gender was not a significant predictor, the current findings are based on a majority female sample (71%), which may compromise interpretation of findings. In addition, this study sought to build upon the findings yielded by Walker & Satterwhite (2002) where family characteristics (support, cohesion, and expectations) were associated with college student GPA. However, we were unable to solicit actual student GPAs from each of the colleges and thus cannot conclude that family-based communal values and practices are associated with student performance vis-à-vis GPA. Future research should examine such associations. Also, considering that self-efficacy, motivation, and self-esteem are antecedents of academic performance (Wigfield & Eccles, 1992), path analytic techniques could be employed to discern whether such psychological factors actually mediate the association between cultural values and academic performance. Of course, a significant relationship between cultural values and achievement is needed prior to mediation investigation (Tabacknick & Fidell, 1996).

Finally, many of the conclusions presented here are premised on the notion that the campus-based experiences of many college undergraduates may reflect mainstream cultural values such as individualism and competition, opposing cultural values of communalism (Boykin, 1986). Yet, this was not ascertained in the current study. To more effectively claim cultural mismatch between students' home cultural experiences and those saturating their college experiences in particular, and to ascertain whether cultural values also serve as a predictor of academic

performance in general, researchers must develop and validate measures that allow cultural values found in undergraduates' home and college experiences to be assessed (Tyler, et al., 2008).

Conclusion

The current study places the importance of culture in the general frameworks (Bean & Mentzer, 1985; Pascarella, 1980; Tinto, 1993) that have advanced research in college student academic performance. Here, black and white college students report virtually the same communal values and activities at home. These reports were predictive of several academic achievement correlates, including self-efficacy and academic motivation. Given these findings, university administrators and faculty should begin to identify and utilize undergraduates' culturally-aligned behavioral patterns in order to provide learning context, instruction, and social interactions that can facilitate their adjustment to campus life, particularly by aligning it with the communal experiences they have at home (Tyler, et al., in press).

The American Psychological Association (2003) has discussed several ways in which therapists can begin to ascertain the cultural values informing clients' behavioral proclivities. One way is to become familiar with the cultural and familial background of the client, thereby allowing culturally grounded behavioral preferences and customs to be illuminated prior to therapy. Similarly, another way faculty members can assess students' culturally aligned and preferred ways of engaging in academic tasks is by simply asking graduate and undergraduate students about their work preferences for completing course requirements (i.e., "What are the conditions under which you carry out your best work?"). Also, it would be helpful to undergraduates to have multiple formats to complete given tasks (i.e., group work versus individualized performance tasks). Allowing students to co-teach lessons would also allow evidence of communal values to be manifested, along with other cultural values brought by diverse college students. With these methods, communal orientations that many black and white students are coming to college with can be duly recognized and utilized throughout students' course completion during their college years (Tyler et al., in press).

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How Prepared are the U. S. Preservice Teachers to Teach English Language Learners?

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This study focuses on self-efficacy, attitudes, perceived preparedness, and the knowledge of preservice teachers in the USA regarding isolated English Language Learners (ELLs) in high school classrooms. In the first study, 62 preservice teachers who were doing their student teaching completed a survey on: (a) their perceived preparation and self-efficacy regarding ELL students, (b) their attitudes towards ELL students in mainstream classrooms and their parents. They also completed an ELL knowledge test. In Study 2, several high school classrooms that included a few ELLs were observed to determine what these students experienced in a mainstream classroom and how the preservice teachers interacted with them. Four Caucasian female pre-service teachers from Study 1 were observed. Results from Study 1 showed that the sense of preparedness was verified by the performance on the knowledge test and was related to self-efficacy. The classroom observations indicated that these preservice teachers were not well prepared to teach ELL students and their mentoring teachers were not providing any guidance.

In classrooms around the world, the number of students who do not speak the predominant language of the country is increasing significantly (Arkoudis, 2005; Milani, 2007, Spotti, 2007). In the US, the population of English Language Learners (ELL) has more than doubled, representing approximately 8.4% of all public school students (Zehler, Fleischman, Hopstock, Stephenson, Pendzick & Sapru, 2003). Although the majority of ELL speak Spanish (Zehler et al, 2003), 56% of schools have students coming from 3-50 different language backgrounds, with 48% of schools having fewer than 30 ELL students. This implies that students from many linguistic backgrounds can be found across mainstream classrooms. We call these students “isolated ELLs.” Teachers in the mainstream classrooms shoulder responsibility for the education of isolated ELLs, including their language development. Unfortunately, teachers, especially in secondary education, are largely untrained to work with ELL students or may assume that ELL students are the responsibility of the English as a Second Language teacher (Reeves, 2006). The isolated ELLs in the classrooms of teachers who do not feel competent or responsible for teaching ELL students become “invisible” or even “powerless” (Yoon, 2008). These patterns of exclusion and neglect are likely to be more serious in high schools, where teachers are more specialized in their own areas (Coulter and Smith, 2006).

In this study, we investigated the self-efficacy and knowledge of preservice teachers to determine how prepared and confident they are for teaching ELL students who are likely to be in their future classrooms. Research of the last few decades has shown that self-efficacy is significantly related to work performance regardless of the complexity of the task. Self-efficacy is the belief in one’s capabilities to organize and

conduct activities to produce certain outcomes, as well as the perception that the surrounding context is controllable (Bandura, 1993; 2004). It relates to performance because it affects the amount of effort expended, persistence at the task, resilience when faced with obstacles, and perceived stress. Individuals who have high self-efficacy put in sufficient effort that may produce successful outcomes, whereas those who have low self-efficacy are likely to give up prematurely and fail on a task. In short, individuals regulate their efforts in accordance with the effects they expect their actions to have.

A teacher’s self-efficacy has a powerful connection to teaching and learning (Tschannen-Moran, Woolfolk, Hoy & Hoy, 1998; Tschannen-Moran & Hoy, 2001). Two questions on a survey (now called the RAND items) turned out to be strong predictors of teacher persistence and effectiveness. The first item, “When it comes right down to it, a teacher can’t do much because most of a student’s motivation and performance depends on his or her home environment,” is considered to reflect an individual’s views on General Teaching Efficacy (GTE), regarding the profession in general and whether or not other factors (e.g., home environment) are perceived to be major influences that are beyond the control of the teacher. The second RAND item, “If I try really hard, I can get through to even the most difficult or unmotivated student,” is considered to reflect one’s own Personal Teaching Efficacy—PTE (Gibson & Dembo, 1994; Henson, 2002).

Self-efficacy scores are related to, among other outcomes, teacher commitment and teacher strategies/practices. Teachers who have lower self-efficacy also have higher levels of stress and are more likely to burn out and leave the profession. Evers, Brouwers, and Tomic (2002) showed that Dutch

teachers' self-efficacy scores were related to their level of burnout. Skaalvik and Skaalvik (2007) found the same link in a Norwegian sample.

Self-efficacy is an important component of behavior change. Teachers may not adopt new strategies if they have doubts about their abilities for successful implementation and they question their role in shaping student outcomes. Smylie (1988) measured the effectiveness of a professional development program and noted that PTE was one of two factors predicting a change in teacher practice (the other factor was class size). Teachers who assume external factors play a larger role than their own skills may believe that there is not much they can do in a classroom, especially with low-achieving students. This of course strengthens the cycle of low expectations and low student outcomes and further supports low teacher self-efficacy beliefs.

Gibson & Dembo (1984) found that although high and low self-efficacy teachers did not differ in their allocation of class time, high efficacy teachers persisted in leading the students to the correct answer, did more whole group work, kept students on task, and were more positive and responsive to the students. Wolters and Daugherty (2007) found that even after variables such as teacher experience and grades taught were entered into the equation, three self-efficacy measures (regarding discipline, instruction, and engagement) together still explained additional variance in how much a mastery structure was used in a classroom.

These results are not surprising when viewed through the lens of Bandura's self-efficacy model. Bandura (1993) has shown that individuals who are high in self-efficacy are more achievement and mastery-oriented, view failures as due to insufficient effort, and work to change strategies and to perform better to get a more positive outcome. In contrast, those with low self-efficacy attribute failure to inherent low ability and give up rather than trying other venues or learning from mistakes. High self-efficacy is also linked with better goal setting, trying to meet challenges, and experiencing less anxiety when faced with a barrier, as there is trust in one's abilities to overcome obstacles.

Snyder and colleagues define the construct of "hope" as self-perceptions regarding the capacities to 1) conceptualize goals, 2) develop strategies to reach these goals, and 3) maintain motivation for using these strategies. Like Bandura's model, Hope theory incorporates goals and individuals' perception of their capacity to achieve these goals, and also includes an awareness of using appropriate strategies and continuous effort (Snyder, Lopez, Shorey, Rand, & Feldman, 2003). Hope theory defines self-efficacy by including not only the confidence in one's capabilities but also the availability of strategies and motivation to accomplish specific goals.

For preservice teachers, the level of specific preparation and knowledge is likely to relate to their self-efficacy about teaching. Indeed Darling-Hammond, Chung, and Frelow (2002) noted that overall perceived preparedness of in-service teachers was significantly correlated with their confidence in their abilities to handle discipline issues, to reach all students, and to make a difference in students' lives, even after factors such as age, experience, grade level taught, and race were entered into the equation.

Smylie (1988) reported that the confidence of preservice teachers about their teaching methodology and skills was the main factor relating to their self-efficacy, again highlighting the importance of their perceived preparedness. To determine teacher self-efficacy, Skaalvik and Skaalvik (2007) used 6 subscales focusing on specific strategies and competencies (instruction, adapting education to individual students' needs, motivating students, keeping discipline, cooperating with colleagues and parents, and coping with changes and challenges).

It is important to study self-efficacy levels of preservice teachers because teachers' personal efficacies remain stable across the years, and in fact may get worse as they start their professional lives. Woolfolk, Hoy, & Spero (2005) followed prospective teachers from the beginning of their preparation to the end of their first year of teaching. These novice teachers showed a significant drop in their efficacy scores as they experienced the real classrooms. The changes in personal efficacy scores were correlated with the perceived support in the school environment. (This in turn was related to school socio-economic status (SES) and how difficult the teaching assignment was perceived by new teachers.) Considering that ELL students are mostly in lower SES schools and urban environments, which are more difficult teaching contexts, self-efficacy of novice teachers becomes an important variable to consider, especially given the fact that teacher self-efficacy is related to student outcomes.

However, there is domain specificity in self-efficacy. For example, self-efficacy specific to math is a better predictor of students' math performance than a global academic self concept or confidence in overall academic abilities (Lent, Brown, & Gore, 1997). Raudenbush, Rowan, and Cheong (1992) found that variation in self-efficacy levels *within* a teacher depended on the class, subject matter, student body characteristics, and how well prepared a teacher felt. Thus, specific questions regarding the classroom contexts and the students illustrate a teacher's self-efficacy better. This also relates to the Hope theory, which includes specific strategies affecting hope or confidence in oneself to accomplish one's goals.

In our two studies assessing self-efficacy, we asked preservice teachers questions about classroom contexts

and strategies, since preservice teachers' efficacy may strongly relate to managing and motivating students (Woolfolk & Hoy, 1990). In every question, we specifically asked about ELL students since even experienced teachers who have high teaching self-efficacy show moderate levels of self-efficacy when asked about ELL students (Karabenick & Clemens Noda, 2004).

We also included questions assessing attitudes towards parents and the presence of ELLs in mainstream classrooms. Because attitudes and behaviors are related, one can predict that more negative attitudes are related to lower levels of preparedness and self-efficacy. If preservice teachers have low self-efficacy regarding ELL students, they may attribute the low achievement of students to factors outside of a teachers' control, particularly an unfavorable impact of parents and home environments.

However, verbal reports of self-efficacy may over or underestimate what a teacher actually accomplishes. In our first study, to support the teachers' self reports of efficacy and preparedness, we assessed their knowledge regarding ELL students. In the second study, we supported the self-reports with actual classroom observations.

Study 1

In this study, preservice teachers completed a survey and a knowledge test. We predicted that their perceived level of preparedness regarding ELLs would be positively correlated with both self-efficacy and actual knowledge. We also predicted that better prepared preservice teachers would have more positive attitudes towards ELLs as well as their parents.

Method

Participants

Participants were 62 preservice teachers in a medium-sized Midwestern university in the USA. The participants had at least 180 hours of classroom experience, had successfully completed two required courses, Human Diversity and Teaching American Indian Students, and had fulfilled the Diversity Immersion Experience Requirement of 60 volunteer hours in a diverse classroom setting

Tasks and Procedure

Prior to the observations, preservice teachers completed a survey on their attitudes, beliefs, and knowledge of ELL issues. The survey was distributed to participants during their methods course. The participants completed a test asking about their

perceptions regarding how they will teach ELL students. Twenty-seven questions pertaining to the students' attitudes, beliefs, and self-efficacy were presented in random order within the survey based on a survey by Darling-Hammond et al. (2002). Questions focusing on the students' attitudes included statements such as: "ELL students in the general education classroom setting slows down the progress of the other students in the class;" "Inclusion of ELL students in general education classes is good in theory, but does not work in the real world;" and "If I try hard, I can get through to most of the ELL students." Questions focusing on the students' beliefs included statements such as: "I am prepared to tailor instructional and other services to the needs to ELL students;" "I have received adequate training to be specifically prepared to tailor instructional and other services to the needs of ELL students;" "I possess a clear understanding of the language demands of the content area that I will teach;" "I am confident in my ability to teach all ELL students to high levels;" and "I am confident of my skills to provide alternative/performance assessments to ELL students." Questions focusing on the students' self-efficacy included statements such as: "I am knowledgeable of teaching practices that are attuned to students' language proficiencies and cognitive levels;" "I am knowledgeable of alternate ways of giving feedback;" and "I am knowledgeable of teaching practices that are culturally supportive and relevant." The survey included ratings of their level of confidence in teaching ELLs, methods about how they would teach them, and general knowledge and attitudes towards ELLs. The rating scale on the survey ranged from a score of 1 = strongly disagree, 2= disagree, 3= neutral, 4 = agree, to 5 = strongly agree. The survey also included open-ended questions that focused on terminology and concepts of ELL education to further assess the students' knowledge of teaching ELL students.

The questions were created to tap into five constructs: (a) self-efficacy regarding ELL students, (b) attitudes towards ELL students in mainstream classrooms, (c) attitudes towards parents of ELL students, (d) perceived knowledge, and (e) perceived preparation.

The authors of this study scored the surveys independently and then compared the results of each survey. The reliability analyses indicated the "perceived knowledge" construct had an unacceptably low level of reliability, so it was not included in any further analyses. The "Attitudes towards parents" construct had a moderate level of reliability ($\alpha=.68$) so it was included in the analyses but data were interpreted with caution. The remaining three constructs had acceptable levels of reliability. The questions and alpha levels are presented in Table 1.

Table 1
Items on the Teacher Survey

Perceived Preparation ($\alpha = .81$)	Higher score indicates more perceived preparedness) 1. I am prepared to tailor instructional and other services to the needs to ELL students 2. I possess a clean understanding of the language demands of the content area that I will teach. 3. I am knowledgeable of teaching strategies and instructional practices for ELL students that are developmentally appropriate. 4. I am knowledgeable of alternate ways of giving feedback. 5. I am knowledgeable of teaching practices that are attuned to students' language proficiencies and cognitive levels 1. 6. I am knowledgeable of teaching practices that are culturally supportive and relevant.
Self-Efficacy ($\alpha = .83$)	(Higher score indicates more perceived self-efficacy) 1. If I try hard, I can get through to most of the ELL students. (RAND-2 item) 2. I am confident in my ability to handle most discipline problems with ELL students. 3. I am confident in my ability to teach all ELL students to high levels. 4. I am confident I am making a difference in the lives of my students. 5. I am uncertain how to teach some of my ELL students. (REVERSE CODED) 6. I feel confident in providing a positive learning environment and create a climate characterized by high expectations. 7. I am confident of my skills to effectively communicate with parents and guardians of ELL students. 8. I am confident of my skills to provide alternative/performance assessments to ELL students. 2. 9. I feel confident in providing linguistically and cultural appropriate learning experiences for ELL students
Attitude Towards ELLs in the Classroom ($\alpha = .79$)	(Higher score indicates a more negative attitude) 1. ELL students in the general education classroom setting slows down the progress of the other students in the class. 2. Inclusion of ELL students in general education classes is good in theory, but does not work in the real world.
Attitude Towards Parents of ELLs ($\alpha = .68$)	(Higher score indicates a more negative attitude) 1. Immigrant parents do not try to learn English. 2. In order for ELLs to learn English, their parents should attempt to speak English.

Table 2
The Means and Standard Deviations of Attitude, Perceived Preparedness,
Self-efficacy and Knowledge Scores and the Correlations Among Scores in Study 1

	Attitude- Students	Attitude- Parents	Perceived Preparedness	Self-efficacy	Knowledge
Attitude- Students	1.0	.31*	-.24*	-.24	-.24*
Attitude- Parents		1.0	-.08	-.03	-.13
Preparedness			1.0	.66*	.32*
Self-efficacy				1.0	.26*
Knowledge					1.0
Mean*	2.25	2.52	3.08	3.23	6.29
Sd	.69	.60	.69	.57	2.83

*scores range from 1-5 for the first 4 measures and 0-26 for the knowledge measure

The second part was a knowledge test. There were 8 terms to define (e.g., immersion, late exit, sheltered instruction, etc.) and five questions. Two questions were about demographics of ELL students to gauge if the preservice teachers were aware of the changing student body in the US and in their state. The remaining three questions were open-ended and focused on assessment and teaching/learning strategies for ELL students in general classrooms. Each question had a score of 2 points possible, with partial credit given.

Results

For each construct on the survey, the ratings were added and divided by the number of questions, hence mean scores ranged from 1-5 for each construct. The

means and standard deviations are given at the bottom of Table 2.

The participants had somewhat positive attitudes to ELL students and their parents, 2.25 and 2.52, respectively. The perceived preparedness (3.08) and self-efficacy (3.23) ratings indicated that the students had neutral views about their preparedness and effectiveness regarding ELL students. Although neutral values may be viewed as a fine outcome, we view it more negatively because these participants had completed their teaching education, as well as diversity training, and were now doing their student teaching. Still they did not feel well-prepared to address the needs of ELL students. Our classroom observations (Study 2) indicated that mentoring teachers were not providing any guidance about isolated ELLs to the

Table 3
The Means (and the Standard Deviations) on the Survey Items and Knowledge
Test for the Four Preservice Teachers (with their Pseudonyms) in Study 2

Teacher	Knowledge (max=26)	Self-efficacy (max=5)	Preparedness (max=5)	Attitude students (max=5)	Attitude parents (max=5)
Teacher1 Marie	4	3.56	3.0	2.0	2.0
Teacher2 Jane	4	2.33	2.5	3.0	2.5
Teacher3 Becky	4	2.78	2.67	1.0	1.5
Teacher4 Laura	8	3.89	3.5	1.0	2.0

student teachers. In short, participants were not well prepared, and their student teaching was not adding any more to their knowledge about ELL pedagogy. The knowledge test verified this concern. The average score of 6.29 out of 26 possible represents only 25% accuracy on the knowledge test.

As seen in Table 2, the four factors were correlated with each other to see their interrelationships. As expected, there was a strong correlation between sense of preparedness and self-efficacy. Students who believed they are well-prepared had higher levels of self-efficacy ($r = .66$). Previous research has highlighted the importance of preparation in self-efficacy, and we found similar patterns within the particular context of ELL teachers. The sense of preparedness could be verified by the actual knowledge test. Individuals who felt better prepared scored higher on the knowledge test ($r = .32$).

The attitudes towards parents construct did not correlate with the other constructs (except for attitudes towards students), possibly because of its lower reliability. Attitudes towards ELL students in general classrooms were marginally related to both the sense of preparedness and knowledge. Those with lower knowledge scores had more negative attitudes; likewise, those who felt less prepared had more negative attitudes.

In a multiple regression analysis, preparedness, self-efficacy, and attitudes towards ELL students were entered into the equation to predict the knowledge score. Perceived preparedness was the only significant variable ($\beta = .321$), explaining 10% of the knowledge test performance. In another analysis, preparedness and attitudes towards ELL students were entered into the equation to predict the self-efficacy score. Again, perceived preparedness was the only significant predictor ($\beta = .663$), explaining 44% of the variance in self-efficacy scores.

Study 2

In this study, we verified the self reported efficacy and preparedness scores with a qualitative, in-depth observation of four preservice teachers (who were part of Study 1) during their student teaching in high

schools. We randomly selected preservice teachers who had isolated ELLs in their classrooms and who were in a high school because currently there is a paucity of research regarding ELLs, especially isolated ELLs, in high schools (Coulter & Smith, 2006).

Methods

The observations evaluated each teacher's use of additional resources, classroom activity alterations, and personal modifications elicited to aide the ELL students. Detailed notes were taken about the lesson and what the preservice teacher did throughout observation periods. In addition, a 61-item observation checklist was used to more specifically document use (or non-use) of the types of general teaching strategies, content delivery methods, assessment procedures, and language strategies incorporated in the lesson. Concepts such as cooperative learning activities, use of graphic organizers, and comprehension questioning strategies were on the checklist. Each preservice teacher was observed twice by the second author. One teacher (Marie) was observed in two separate classrooms, thus there were a total of 10 observations.

Results

Table 3 summarizes data from the surveys and knowledge test (discussed in Study 1) specifically for the four preservice teachers who were observed. All four participants had relatively positive attitudes towards the ELLs and their parents. The perceived preparedness and self-efficacy ratings were low. This was supported by low levels of performance on the knowledge test (about 15% correct for three participants and 30% for the fourth participant).

Across 10 observations, three themes became apparent: (a) Neglect; (b) Peer support; (c) No mentoring by supervising teachers. Neglect refers to implicit understanding between the teacher and the ELL student to leave each other alone. Preservice teachers did not interact with ELL students and ELL students did not call attention to themselves. However, peers provided some support and help to ELL students. While this non-interaction between preservice teachers

and ELL students was occurring, there was no guidance from the mentoring teacher. Below are specific examples from each of the five classrooms illustrating these themes:

Teacher 1: Marie (First Classroom)

Marie had 26 students in the 11th grade Language Arts class. Within this class was one student (Haru) who spoke fluent Japanese and limited English. He received pull out services from the ESL teacher to build his vocabulary, but this instruction was different from the Language Arts class curriculum.

During the observation, the class read a short story in small groups of five students. Students were to answer two discussion questions and underline important parts of the story. Haru did not seem to understand the directions and copied the questions from a student sitting next to him. Haru was able to read his section aloud, but spoke very quietly and read very slowly, making 4 decoding mistakes of vocabulary words (these words were not included in his vocabulary instruction). As students read through the story, everyone except Haru underlined important parts of the story. During small group instruction, Haru remained quiet and copied answers from another student. The student he was copying from neither seemed to mind nor to acknowledge this activity. Whole class discussion to clarify symbolism took place. Throughout this activity, Haru stared into space and finally put his head down on the desk and did not participate.

During the second observation, Haru was late to class and without his homework. He spent several minutes looking for the story, which he never found. He missed the directions to answer comprehension questions and copied the answers from another student. Once he was finished copying answers, he put his head down on his desk and went to sleep for the remainder of the class period.

Marie told the entire class to form groups and to read the story aloud, underline certain parts of the story that seemed relevant, and discuss its main points. Comprehension questions were also provided orally, and directions were repeated 4-5 times. During whole class discussion activities, Marie remained at the front of the class standing behind a podium. The mentoring teacher remained in the classroom and would make comments of the story to relate to students' real-life situations.

After class, the researcher met with Marie and asked her if she thought Haru understood the story and the symbolism. She thought he was following along fine and seemed to understand the main idea, but she was not sure if he understood symbolism due to translation difficulties in his native language. When asked about his participation, she said many of the

students do not openly express their ideas, but she can tell if they are engaged or not.

Teacher 1: Marie (Second Classroom)

In Marie's second Language Arts class there were 18 students in 11th grade. There was one student from Serbia (Benjamin) who spoke fluent Serbian and was reported to be fairly fluent in English. Marie said she used a special vocabulary list acquired from the ESL teacher as described in Case Study 1, but Benjamin did not receive pull out services.

This class had the same activities as the class discussed before. Benjamin was staring off into space and was not paying attention when the directions were given. He looked at another student's paper but did not copy the questions. He did not know which group to get into. After a couple of minutes of confusion, a student pulled him into his group. His group chose to read the short story silently. It did not appear that Benjamin was reading the story; he just sat and stared at the paper. After silent reading, the group had minimal discussion of the main idea, they did not discuss the symbolism of the story, nor did they write anything down on paper. Benjamin did not participate at all during this discussion time. Benjamin had his head down on the desk for several minutes while the teacher was talking. At one point he started talking to another student—clearly not about the story because they were laughing and whispering to each other.

The next class session, Benjamin could not find his story after several minutes of searching his backpack. He put his head down on his desk and shut his eyes for 10 minutes. A student who sat next to Benjamin showed him his answers and Benjamin copied them onto a sheet of paper. No discussion took place with the other student, who did not seem to mind his answers being copied. After Benjamin copied the answers onto his paper, he put his head down on his desk and fell asleep until the class bell rang.

After class Marie told the researcher that she was disappointed with the students' lack of understanding the concept of symbolism and with the lack of participation during whole-class discussion. She did not seem disappointed in Benjamin's lack of participation; she said he is always quiet and she thinks that is cultural. When asked if she noticed that he did not have his story at the beginning of class, she said he always loses his assignments and she was tired of always giving him extra copies.

Teacher 2: Jane

Jane was teaching 26 12th graders in the Language Arts classroom. Within this class there was one ELL student (Amy) who is both German and Japanese. She

was raised in Japan and spoke fluent Japanese; she did not speak German, and her English was comprehensible at a basic level. This particular class was a requirement for seniors who have not performed well in previous Language Arts classes, so there was a wide range of ability levels.

The routine for this class included 15 minutes of silent reading each day, followed by a quiz that covered the previous day's reading assignment from the literature book. Jane presented directions to the class orally, and provided wait time for students to respond before starting the next activity. During the quiz, Jane read five questions, one at a time, and waited for students to write their answers. Jane reviewed the answers orally to the whole class. As Jane provided the answers to the quiz, each student graded their own work. After she provided a synopsis of the novel students were reading, she had a whole class discussion of the main parts of the book. She asked several questions but did not call on specific students to answer. Generally, the same 3-4 students answered. This was followed by a video clip about war. On the next day, there was again silent reading and a quiz, but instead of the video, students worked independently on an art project.

Amy sat quietly and read her book during silent reading. After the quiz was completed, Amy asked Jane what the word "loan" on the quiz meant. Jane verbally tried to explain the concept to her, but Amy still did not understand. Then Jane tried to demonstrate the words "borrow" and "lend" with her pencil by handing it to Amy, but Amy still did not understand. Amy got a 4 out of 5 on the quiz correct. (She had left blank the question having to do with the concept of "loan.") The researcher did not notice Amy interacting with any students during down time in the class or during class discussions.

During the second observation, Amy got 2 out of 5 questions correct on her quiz. After the quiz, students completed their art projects that focused on a part of the literature book. Amy worked alone but was actively engaged in this assignment. She did not speak to any other students during this time, while other students became increasingly vocal.

Jane reported that Amy did not participate in large group discussions. She apparently participated more in smaller groups; however, small group activities were hard to do in such a large class. Jane reported that Amy was very artistic, so they provided many opportunities to do art projects that relate to literature in this class.

Teacher 3: Becky

Becky was teaching 25 students in an 11th grade Language Arts classroom. Within this classroom there was one ELL student from Japan (Akio) who, according to the teacher, spoke fluent English.

The mentoring teacher introduced concept of proverbs by reading the beginnings of different phrases and having students guess the endings (e.g., "An ounce of . . ."). The mentoring teacher then conducted a question and answer session on how to write a thesis statement and supporting details. Students exchanged papers for peer editing. When the students got a little loud, he played classical music and told the students that he would have to resort to changing diapers.

Throughout the entire class time, as other students asked questions, Akio filled out a form that was not related to class. When students exchanged papers with a partner for peer editing, Akio continued to fill out his form and did not exchange papers. When Becky asked to see his paper to check off the assignment, he just shrugged his shoulders and indicated he was not finished. Then, Akio spent several minutes helping another student on a math assignment; both students did not complete their writing assignments. At one point, Akio left his desk and crouched by a boy he was helping with math to better explain the problems. He kept going back and forth between editing his paper and helping his classmate with math.

Becky tried to walk around the crowded room and to keep students focused on their writing assignment. The mentoring teacher sat at the desk in front of class and met with students who voluntarily wanted help.

During the second observation, class was held in the computer lab. The teachers only assisted those students who requested help on their writing assignment. These teachers seemed to ignore at least half of the students who were also in the computer lab but were engaged on computers with activities other than the writing assignment.

After class, the researcher spoke with both teachers about Akio. The mentoring teacher said the English department "does not know what to do with this student;" he has always received A's and B's because teachers pass him up and do not know how to grade him. He earned a C last semester. They thought Akio was a hard working student. Akio was going to a small liberal arts college the next year and the teachers were concerned about his writing. They had been in contact with a local university's ESL teachers to get some ideas for accommodations. Suggested accommodations included: breaking writing assignments into small segments, teacher provides initial editing and feedback, and student write second draft with edits.

Teacher 4: Laura

Laura was teaching 30 students in 10th and 11th grade Algebra 2. In this classroom there was one ELL student from Japan (Daichi) who spoke limited English. Daichi had an ESL teacher also from Japan who worked with him in class.

At the beginning of class, Laura reviewed the answers to the previous math test. After the review, instruction on the next chapter was presented orally and displayed on the overhead projector. The ESL teacher checked Daichi's work as each problem was discussed. Daichi seemed to follow along without assistance; when he missed a problem, the ESL teacher pointed to it and had him correct his work. During math instruction, when the teacher asked a question, Daichi never responded; he always averted his eyes downward, sat silently, and never answered a question. He spoke with the ESL teacher in Japanese. The ESL teacher also wrote down math information in her notebook. Daichi stopped trying to copy from the board; he tried to listen as the ESL teacher wrote the notes. Then he copied from her notes.

Laura used the overhead projector to display math problems and asked the class what to do first to solve the problem. Laura worked out problems using a talk aloud method for solving the problem. All of the students sat quietly as Laura solved problems on the overhead. Laura orally reviewed what would be on the quiz for the next day, and she provided directions to put information on a note card.

Laura introduced a new section in the math text, and Daichi had trouble finding the correct page in the textbook. Laura continued her instruction as he tried to find the correct page. She put information on the overhead and talked through solving the problem; the pace was very quick. After instruction, time was given to complete homework. Daichi stayed in his seat and worked on his homework.

During the second observation, the class had the same routine as the earlier observation. Daichi had his ESL teacher with him who reviewed his work, checked his problems, and took notes for him. Daichi got lost in taking notes a couple of times, and the ESL teacher got him back on track. Laura did not stop instruction or even notice when students were lost. Students did not raise their hands to ask questions. Again problems requiring multiple steps to solve were put on the overhead. Laura provided talk alouds when she went over the problems but did not ask comprehension questions to any students. The pace of the class was very fast. The ESL teacher was writing and taking notes frantically; she would periodically check Daichi's work to make sure he was following along. Laura did not check any students' notes; she kept going through several problems at a quick pace.

Conclusions

The two studies painted a grim picture at several different levels. First, the pre-service teachers clearly articulated they did not feel prepared to educate the ELL students they would encounter in their mainstream

classrooms. Their self-perceptions were verified by their poor responses to knowledge questions. The classroom observations indicated that the preservice teachers treated isolated ELLs with neglect. Across five different classrooms, we observed very little interaction between teachers and their ELL students. ELL students were not disruptive; they worked or acted as if they were working on assignments that were given. During class discussions, teachers did not call on them or interact with them. The teachers interpreted lack of participation as cultural/personal and did not make an effort to pull the student into the discussion. The lack of participation was rationalized by Marie when she stated she did not seem disappointed in Benjamin's lack of participation; she said he is always quiet and she thinks that is cultural. The pattern of neglect relates to self-efficacy. Preservice teachers who do not feel well-prepared to teach ELL students do not seem to know how to engage these students.

Sensitizing pre-service teachers to cultural and linguistic differences they can expect to encounter in their future classrooms is an essential first step. However, it is also necessary to provide preservice teachers with actual tools and strategies, since cultural sensitivities cannot be easily transported to a classroom without those tools (Rodriguez & Sjostrom, 1995).

Second, mentoring teachers did not model any behaviors or themselves interact with the ELL students. This provided the preservice teacher with insufficient mentoring about (isolated) ELLs. Veteran teachers seem to need in-service support regarding ELLs so that they can become better mentors for preservice teachers.

Third, except for one classroom in which there was a tutor, there was no support for ELL students in the classrooms. Although some students were in pullout ESL classes, the ESL and classroom content did not seem to be coordinated. In addition, pullout classes reportedly focused mostly on teaching vocabulary and not on other proficiencies such as comprehending connected text, understanding oral instructions, and writing. A coordinated effort needs to take place between the ESL and regular classroom teachers to and integrate language and content instruction. The acquisition of vocabulary words is only one set of skills necessary for language development. In addition, background knowledge is vital in understanding concepts.

Although we identified several negative results, we did observe some positive teaching strategies that were implemented in the classrooms. Students had the opportunity to share and discuss ideas in small cooperative learning groups. We observed one teacher using the think aloud method (Montgomery, 2001) to model cognitive processes involved in solving math problems. Also, students had the opportunity to choose alternative projects (e.g., art) to demonstrate their knowledge of the literature assignment.

One unexpected positive result was the interaction among peers. Although we did not observe any vigorous or sustained conversations among the ELL students and their peers, peers were the most helpful members in the classroom. The peers, in their own way, accommodated the needs of ELL students and in turn asked for help from ELL students in some instances. To capitalize on the positive interactions with peers, teachers can incorporate peer-tutoring procedures in the classroom setting. Peer tutoring can provide opportunities for monitoring student achievement and providing explicit instruction and feedback (S'aenz, Fuchs and Fuchs, 2005).

For isolated ELLs, their classroom teacher may be their one and only resource. The self-efficacy of the teacher regarding ELLs influences classroom culture and student outcomes. Our data imply that preparing preservice teachers thoroughly to reach ELL students is likely to lead to better knowledge and higher levels of self-efficacy. This in turn can translate into increased teacher commitment and better educational opportunities for ELL students.

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Master's Degree "Educating in Diversity" (MDED): Toward Inclusion Education Quality

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Special education master's degrees are proliferating, most probably in response to the requirement for all special education teachers to be highly qualified. The aim of the study is to evaluate the 10-year Master's Degree "Educating in Diversity" (MDED) at the University of La Laguna (ULL) and to examine the extent to which the development of diversity competencies in graduates is related to their perceptions of the overall quality of the postgraduate program. Two hundred and eight University students and 235 part-time faculty members evaluated the basic program indicators. Finally, MDED results gathered from 135 postgraduates and 707 beneficiaries indicate high levels of purpose achievement and satisfaction with the program, the faculty, and the curricular content. The framework for improvement in which the MDED is viewed as compatible with national and regional evaluation and accrediting agencies is discussed.

Since 1994, the University of La Laguna (ULL) in the Canary Islands, Spain, has offered a rigorous two-year, 150-credit-hour Master's Degree "Educating in Diversity" (MDED). The program has been developed with the fundamental aim of improving the quality of the special education teachers (SETs) for a broad concept of diversity education that includes issues in contemporary approaches to multicultural education (Pohan & Aguilar, 2001). As in many other countries, Spanish general education teachers (GETs) are teaching students with a wide variety of learning and behavioral needs in wide-ranging instructional situations. The Spanish school and curriculum normalization and mainstreaming movements that occurred in 1995 have made the inclusion of boys and girls with special educational needs in general education classrooms a compulsory approach. The enactment of the *Education Law* in 2006 paved the way for the mainstreaming of boys and girls with disabilities, requiring that they be placed in normal classrooms or special education units or schools. In addition, GETs are moving toward more inclusive educational practices, from simply providing special education students with learning opportunities to the provision of full inclusion services.

SETs' thinking is complex and may tend to focus on the needs of the individual student, as Stough and Palmer found (2003, p. 219), but they do not have meaningful patterns that enable them to perform all tasks needed within the diversity domain. The caseload (i.e., the type of school program, preparation and type of staff, student disability label, and grade level) is assumed to be one of the main determinants of what is required of qualified SETs in Canarian schools. The regional community has prescriptive regulations concerning caseload. However, how caseload influences outcomes for students with disabilities is supposedly unknown (McLeskey, Tyler, & Flippin, 2004). According to Rosenberg and Sindelar (2005),

teacher shortages in special education are due to insufficient supply of personnel with full academic credentials. This shortage of individuals is also happening in the Canarian general and special education schools. Unfortunately, more services such as "consulting teacher services, cooperative teaching in the classroom, supportive resource programs, and instructional assistants" (Idol, 2003, p. 90) are needed for GETs and SETs to work collaboratively. For SETs to collaborate effectively with other professionals requires competence in the general education curriculum as well as effective interpersonal communication abilities (Lovingfoss, Molloy, Harris, & Graham, 2001). Thus, the para-educator workforce may be a potential pool to meet the demand for highly qualified SETs who could address the scarcity of professionals in special education (White, 2003).

Recent investigation shows that carefully designed training programs help achieve the aim of reducing stress rates for new teachers (Brownell, Hirsch, & Seo, 2004). Successful training program indicators include thoroughly supervised field experiences, collaboration between personnel, and training program evaluation. Nowadays, most teacher education program principles include teaching competencies that students are expected to practice. The manner in which teaching competencies are delineated varies depending on the aims of the teacher education program. Upgrading the quality of special education teacher education programs requires the provision of SETs capable of adapting both their classroom instruction and out-of-classroom practices in response to changing special educational trends and policy demands. Those programs can be implemented by education training units providing short courses for SETs or by enrolling such teachers in postgraduate teacher preparation programs at universities (Boe, 2006).

Yet, research in special education teacher education programs is almost nonexistent (Brownell, Ross, Colón, & McCallum, 2005). Nevertheless, Brown, Welsh, Hill, & Cipko (2008), in a study realized in the United States, assessed teacher candidates' knowledge of and attitudes towards teaching students with learning disabilities and concluded "There is evidence in the literature to suggest, however, that one stand-alone course in this area may not be sufficient to increase the skill, competence, and confidence of the general educator when working with children with learning disabilities" (p. 2093). Generally speaking, a few studies conducted in several countries tend to support the view that special education qualifications acquired from pre- or in-service courses are related to less opposition to classroom inclusive practices (Avramidis & Norwich, 2002).

Spanish universities' initial training programs for SETs were established in 1991 but provided SETs with insufficient instruction to be successful in inclusive classrooms. Also, GETs are concerned regarding a lack of confidence in teaching students who are mainstreamed. At present, some universities are advocating an enriched model of special teacher education where students take a master's degree program that professionalizes them in special education issues. The ULL's MDED assumes a philosophy that considers the University student as both scholar and professional. The two-year MDED is designed to prepare GETs and SETs in 1,500 hours (150 credits) for positions within schools, vocational workshops, and residential settings that serve persons with mild to severe disabilities. The obtainment of an MDED is important because it is not only an indication that special education personnel are highly trained or qualified but also a necessary degree to increase the number of leaders in special education and related fields.

From another point of view, UNESCO notes that employability has recently occupied a better position in the European debate on the reform of higher education. It also contends that many professional master's degrees are proposed to make graduates more employable and are becoming more closely linked to labor market competencies (*Shared 'Dublin' Descriptors*, 2004).

MDED's students specialize in core competencies through elective coursework, practicum experiences, and defending a research project to make data-driven decisions to serve the community's students with disabilities. For this reason, the primary goals in the MDED are:

1. Provide advanced information and training to graduate students and in-service professionals in the field of Special Education for instructional

intervention, with outcome evaluation measured through systematic course exams and assignments (competencies # 1, #2, and # 8).

2. Address the requirements of recent Canary Islands legislation and provide training in research to prepare Special Education professionals to make data-driven decisions that lead to the best possible outcomes for students by carrying out applied research with human participants in various contexts (competencies # 3, #6, #7, and #10).

3. Allow the ULL to address the needs of persons with disabilities, participate in integrated and inclusive educational settings, and contribute to the improvement of local and regional communities by providing interaction with parents, children, and professionals (competencies # 4, # 5, and #9).

These goals are to be achieved through the guidelines of core course modules and elective seminars which insure that all general competencies are demonstrated and evaluated. Careful and complete practicum work with children or adults who have disabilities is required, integrated well with coursework, and supervised carefully. Finally, MDED defines general and specific competencies or abilities that effective special educators should possess by the time they leave the ULL training institution.

The competencies matrix is intended as the core around which faculty members design course modules and evaluate the content of course modules. Competency based grading is defined as a mastery of "carefully specified special education objectives." These general and specific MDED competencies are shown in Table 1.

Part-time faculty and students monitor the accomplishment of competencies for quality teaching. These MDED features are common to other effective indicators of teacher training programs (Brownell et al., 2005). MDED also provides assistance to students seeking employment in special education. To this end, guest speakers and external suppliers from 113 local public and private special education schools, government, or community organizations were supported by MDED's Chief Executive.

According to Delaney (1997, p. 242), "Historical analysis has revealed that assessment of master's degree programs in the United States was rarely mentioned in the literature until the 1970s." In response to this limitation, attributes of high-quality master's experiences that could form the basis for a quality assurance system based upon performance indicators have been identified in European higher education (Jeliaskova & Westerheijden, 2002) as well as in other countries (Hendry, Cumming, Lyon, & Gordon, 2001).

Table 1
MDED Competencies Matrix

Core Competencies	Content Courses (90 credits). Specific Competencies	Practicum (30 credits). Specific Competencies	Research Project (30 credits). Specific Competencies
1. Basic general knowledge in the field of study	Capacity for applying knowledge in practice: Interrelationship between school and society for all (Module 1)	Ability to identify potential connections between aspects of school and society, and their application in educational policies and contexts	Ability to work autonomously, preserving a community that values and celebrates ethnic, cultural, and socioeconomic diversity.
2. Ability to question concepts and theories encountered in special education studies	Ability to recognize the diversity of children with sensorial difficulties and the complexities of the learning process (Module 2)	Awareness of different multi sensory therapies	Demonstration of professional skills: Observation and measurement of stimulating activities
3. Capacity for analysis and synthesis	Ability to analyze concepts, theories, and issues of diversity related to motor and neuromuscular disorders (Module 3)	Information management skills (ability to retrieve and analyze information from different sources)	Ability to develop and evaluate motor function measures
4. Ability to foresee new rational and cognitive needs and demands	Ability to question concepts and theories encountered in rational-emotive and cognitive studies (Module 4)	Awareness of the different situations in which cognitive behavior therapy can take place	Measuring psychoeducational change
5. Capacity to adapt to new situations	Ability to critically review studies dealing with attitudes towards self, social cognition, and psychological and psychiatric issues (Module 5)	Ability to communicate with experts in child and adolescent psychiatric care units	Capacity to work in an interdisciplinary team (child and adolescent psychiatric services)
6. Interpersonal skills	Special educational needs (SEN), and transition to adulthood for students with disturbances (Module 6)	Counseling skills and psychotherapy for children with mental retardation and borderline intelligence	Literacy in using assistive technology tools
7. Critical abilities in teamwork	Diversity issues for exceptional learners (Module 6)	Use of systematic screening and progress monitoring, providing specific activities and approaches with other professionals (i.e. caregivers)	Advanced methods in early childhood special education
8. Discernment of diversity, multiculturalism, and social marginalization	Capacity to learn cultural awareness (Module 7)	Capacity for generating new multicultural programs	Ability to explore educational programs with highly marginalized populations
9. Ethical commitment	Ethical climate and ethical culture in inclusion school centers (Module 7)	Inclusion and collaboration with social agents	Measurement of ethical climates of organizational commitment
10. Research skills	Developing a participatory multidisciplinary team approach (all modules)	Ability to manage projects for inclusion school improvement/development	Ability to apply research methods in different contexts

The ULL's MDED has been consistently addressing a quality assurance system to determine its strengths and weaknesses. In one study, some MDED model dimensions were rated by 240 part-time faculty in the 1994–2004 period (Alegre, 2006). In order to safeguard minimum standards, a quality assurance exercise to evaluate the process accuracy was done by all currently enrolled students. Every two

years, overall MDED internal evaluations were also conducted to promote students' involvement.

We sought to test the basic hypothesis that personnel involved in the master's degree program will develop a better understanding of inclusion competencies through the implementation of MDED. Specifically, three basic research questions, each corresponding with issues of

MDED organization implementation and results effects, were addressed:

1. Do students and part-time faculty perceive short-term results concerning the MDED organization with respect to its strengths and weaknesses?
2. Are there linkages between customer satisfaction (postgraduates), employee satisfaction (part-time faculty), and MDED organizational measures?
3. Are core MDED competencies successfully delivered by postgraduates, according to the perceptions of postgraduates' peers and beneficiaries (adults and school boys and girls)?

MDED necessitated a closer communication between educators and labor organizations (i.e. labor market connectivity). This communication information was important because it can point to both the obstacles to building MDED–labor market connections and the responsibility for providing students with the competencies they need for the workplace.

Method

Participants

In the two-year MDED, the total number of University students enrolled over a period of 10 years was 208 individuals, with a greater number of women than men: 184 females versus 24 males. Part-time faculty taking part in this analysis ($N = 235$) came from several Spanish and international universities. Also, this study involved 135 postgraduate special education participants in order to examine their special education work experiences and career concerns. Therefore, postgraduates with labor market knowledge, including 70 individuals with social contracts or grants, were selected to answer some questions in a 10-minute interview. The majority of the postgraduates' peers were women, who represented 76.2% of 303 asked to respond. They worked in public and private special education schools, town halls, universities, hospitals, or community organizations. Finally, 707 MDED beneficiaries (students with disabilities who were receiving learning and professional support within general and inclusion-oriented classes, and other adult community personnel) were also surveyed, 465 of whom were female (65.8%) and 242 male (34.2%). The public and private special education schools, government, or community organizations that participated in this study were located in urban, suburban, and rural settings. Considered together, the largest age group of

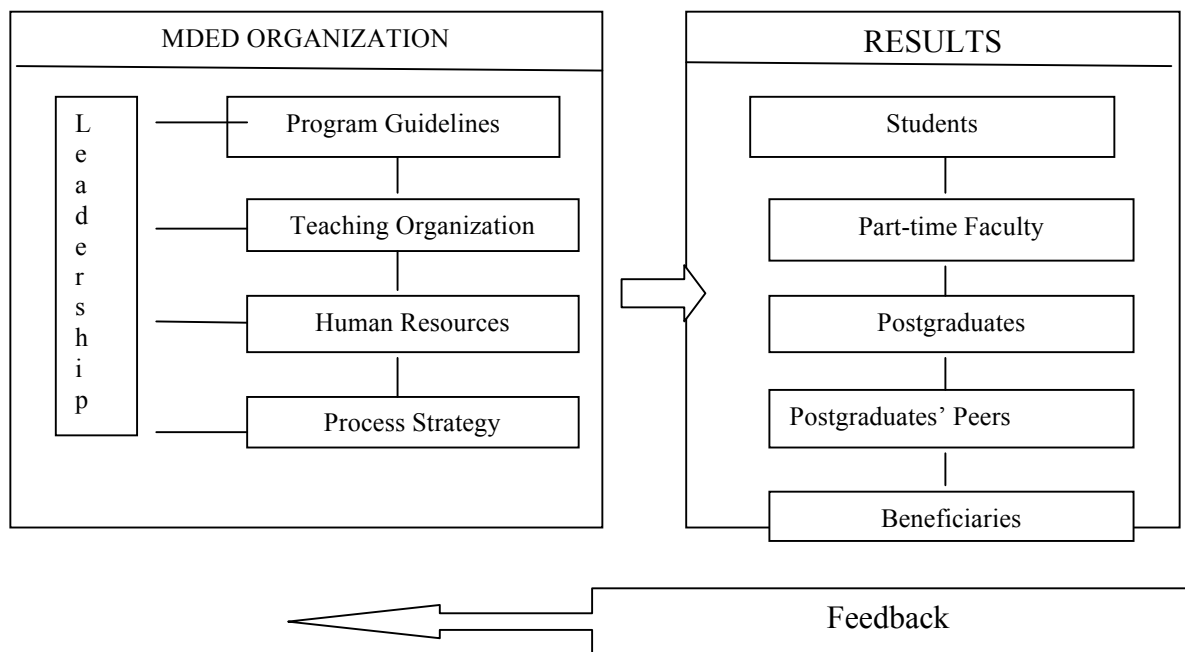
beneficiaries was the 16–19 year range ($N = 201$ students).

Data Collection Instruments

To provide information about the processes and products of MDED for 1994–96, 1997–99, 1999–2001, 2001–03, and 2003–05, a number of instruments were used as part of the evaluation. A database system was designed for structured data. This database application involved high-dimensional data and allowed precise data retrieval queries. Organization of the data followed a layered architecture that modeled separately the personal information, domain data, and application data. Data were also collected from academic records, academic staff's diaries, papers, photos, talks, cost expenditures, and so forth. Analyses of these data are published in a report and will be the basis of future investigations (Alegre & Villar, 2008). The tools had strong face and content validity and the reliability was high for each instrument. Determination of face and content validity involved evaluation of the tools by expert University judges. One of the basic aims of the MDED evaluation tools is simply to focus faculty and other beneficiaries' attention on some of the most important aspects of Master's degrees in Special Education. Evaluation tools were designed and conducted to assist students, faculty, postgraduates and other community beneficiaries (other practitioners and educational organizations) to assess MDED's merit and worth. We developed a multi-level evaluation strategy that sought to place differing faculty member's, students' and beneficiaries' expectations into complementary relationships, in order to enhance the development of MDED. The following evaluations were created:

Student MDED Assessment Questionnaire (SMAQ). A response sheet combining methods of evaluation (grading and open questions) attempted to qualify the MDED organization's value. Administered at the end of each course module, this instrument obtained students' demographic descriptions and judgments of the effects of MDED on special education and professional development. It was also used to rate the strengths and weaknesses of MDED on a five-point Likert scale (e.g., "Do you believe your learning has benefited from this teaching module?"). Items rated "1 = strongly disagree" and "5 = strongly agree" were considered as strengths and weaknesses, respectively. Specifically, the questions of the survey addressed (a) the management commitment of the director, (b) the relevance of the program guidelines, (c) the assessment of the teaching organization, (d) the assessment of human resources, (e) the routines generated that facilitated or hindered the application of competencies in the process strategy, and (f) the impact of MDED on its members (Q1).

Figure 1
MDED Quality Criteria



Part-time Faculty MDED Assessment Questionnaire (FMAQ). A response sheet was completed which provided demographic data and opinions about each MDED edition. Background variables derived from each specific response sheet included genre, age, expectations, perceptions, academic or professional experience, and so on. It was also used to assess overall satisfaction with MDED. Specifically, three dimensions were covered in the instrument including MDED organization (28 items) and self-assessment (20 items). It was also used to rate the strengths and weaknesses of MDED on a five-point Likert scale (e.g., "I reflect on my teaching on the module"). Items rated "1 = strongly disagree" and "5 = strongly agree" were considered as strengths and weaknesses respectively. Additionally, an ordinal variable was proposed to measure the following hypothetical construct: Item 49. "Rate from 0 to 5 your satisfaction perception of MDED teaching-learning processes." The reliability of the instrument was .890 (Cronbach's alpha) (Q1 and Q2).

Postgraduates' Satisfaction and Usefulness Questionnaire (PSUQ). Six dimensions were covered in the instrument including content, practicum, research project, competencies, professionalization, and general evaluation. A list of 50 items in the form of a positive Likert-type scale asked postgraduates to rate the perceived usefulness of specific MDED dimensions

ranging from 1 (poor) to 5 (excellent). An additional question asked about suggestions for improving MDED. It was a hypothetical construct continuous variable, measured on a five-point Likert-type ordinal scale (responses ranged from "strongly agree" (5) to "strongly disagree" (1) (e.g., "I am satisfied with my learning on MDED"). The reliability of the instrument was .912 (Cronbach's alpha) (Q2).

Beneficiary scale about the use of MDED inclusion competencies. An 11-item Likert-type scale called "Postgraduates' Assessment by Peers" (PAP) was circulated to all 303 peers of postgraduates to measure the perceived use of MDED competencies, from 1 (weakest capability) to 5 (strongest capability), with a reliability of .880 (Cronbach's alpha) (e.g., "I verify that he or she demonstrated professional competencies learned from the master's program"). The same scale was also passed to 225 beneficiaries (adults) (Cronbach's alpha = .857). Finally, the "Postgraduates' Assessment by Beneficiaries – Children" (PAS-C) was distributed among 482 school boys and girls. A 10-item Likert-type scale was used to measure the perceived usefulness construct (e.g., "My teacher enjoys teaching materials for children who have difficulty learning"). The items were scored on a five-point scale ranging from 1 (least capability) to 5 (greatest capability). Cronbach's alpha showed a high degree of internal consistency reliability (.920) (Q3).

While the SMAQ and FMAQ were distributed to all the new first year students and part-time faculty members in the participating courses during instruction, PSUQ and PAP were administered at the end of the final professional stage of MDED.

Procedure

The proposed method has two stages. The first stage involves using an internal evaluation of students' and part-time faculty's opinions on MDED quality criteria (Figure 1). In fact, the European Foundation of Quality Management (EFQM) model is followed as a means for measuring and improving the overall quality of MDED, as happens with other excellence projects in Western Europe (Westerveld, 2003; Calvo-Mora, Leal, & Roldan, 2005), because the EFQM Excellence Model is the most widely used model for self-assessment in Europe.

Five cycles of data collection are used to assess the 10-year MDED curriculum (1994–96, 1997–99, 1999–2001, 2001–03, and 2003–05). Each student and part-time faculty cohort assessed the quality criteria affecting each two-year MDED. The assessment of student performance on each module was conducted with reference to the competencies that are recommended by MDED program guidelines (see Table 1). Proposed program guidelines are aligned to general and specific competencies. The obtainment of general and specific competencies was determined by the compilation of a variety of evidences and products. The director, committees, and academic councils developed teaching guidelines, established relationships with organizations, contracted qualified part-time faculty, managed and improved teaching and learning strategic processes required for sustainable success, and implemented these via their actions and competencies in order to fully satisfy students, customers, and other beneficiaries. Student evaluations and part-time faculty evaluations were collected for each course module and practicum; the research project capstone was a thesis. However, there is no knowledge about the relationships between the MDED organization (enabler criteria) and the most crucial of the MDED results criteria, "people results" (students, part-time faculty, postgraduates, postgraduates' peers, and other beneficiaries).

The second stage of the analysis involves estimating impacts on subgroup members. These considerations suggest that there is a need for an MDED that links people results to the MDED organization that executive management can use in order to increase the satisfaction of the students and part-time faculty, and thus the satisfaction of postgraduates, postgraduates' peers, and other beneficiaries. Knowledge of the MDED learning

results is feedback from the special education workplace, which was used to improve MDED organization.

Data Analysis

Our approach proceeded from descriptive non-experimental research and explanatory non-experimental research to predictive non-experimental research. Values were imported from the Statistical Package for the Social Sciences (SPSS) 13.1 for Windows. Chi-square statistics and *t* tests were used to examine differences in groups and MDED quality criteria by demographic characteristics. Various exploratory factor analyses with a principal component analysis and varimax-rotation were conducted on the satisfaction variables. A regression model was used to control for differences in individual student characteristics while measuring MDED effects.

Results

Descriptive Results About MDED Quality Assurance

In order to examine the relations of demographic characteristics of MDED agents such as sex, age, degree, GPA, grant, employment, experience, and motivation (students), and sex, age, professional position, educational level, teaching experience, geographical settings, and development programs (faculty) with MDED organizational strengths and weaknesses, the responses of 443 individuals were examined. To determine the quality service rates of the "units of goodness packed into the training service," we used simple percentage counts of the critical variables of MDED practices provided by students and part-time faculty through the SMAQ and FMAQ, and therefore high response percentages indicating strong personal support for MDED quality criteria and indicators are presented in Table 2. What are the individuals' characteristics that are able to capture the range of values (strengths and weaknesses) of an atypically insular MDED?

Students. Of the 208 students in the 10-year MDED, females made up 88.5% of the respondents ($N = 184$) while 11.5% were males ($N = 24$). Cramer's V was used for measuring the strength of association or dependency between two categorical variables in a contingency table. There was a smaller association between the categorical variables female \times male ($V = .245$). Moreover, based on the results of Levene's test, a *t* test shows there was a significant difference between female and male opinions with respect to the usefulness of MDED [$t(-2.713)$, $p < .008$]. By age group, 69.7% were 19 to 24 years old (the younger group), 16.3%

were 26 to 30 years old (the middle age group), and 13.9% were 30 years or older (the older group). With respect to University GPA, 44.7% of students had median performance and 37.6% had low performance, while high GPA students comprised only 17.8% of the sample. University tuition fees were paid by 94.2% of students, while 5.8% of students were entitled to a University grant. Approximately 27% of students were working while attending MDED, but the unemployment rate was high (38.9% of students), and 34.1% of students were not seeking employment. Therefore, 73.4% of students did not have professional experience, 14% reported having more than three years' experience, and 12.6% replied that they had less than three years' experience. Employability was clearly not the main motivation for students to obtain a master's degree. Almost 52.9% of current MDED students did not answer this question about motivation, 21.6% said that the most important reason to study was to learn more in-depth information, 19.7% were interested in inclusion content, and 5.8% wanted to learn about other educational contexts. It should be noted, however, that Cramer's V statistics revealed some significant interrelations among variables: student employment \times practicum qualification ($V = .163$) and research project ($V = .166$); participant's GPA mean level \times module 5 qualification ($V = .267$), research project presentation and defense ($V = .164$) and practicum ($V = .272$); student's degree \times labor situation ($V = .451$) and practicum qualification ($V = .226$); and students' age \times students' degree ($V = .284$), labor situation ($V = .326$), and practicum qualification ($V = .225$). The null hypothesis which stated that the two groups do not differ was accepted, and accordingly one t statistic was applied for age, degree, GPA, grant, employment, experience, and motivation.

Part-time faculty. In terms of staff characteristics, 52.2% ($N = 128$) were men. The total number of core faculty was divided by age into three different groups: 11.1% were 25–39 years old (novice faculty), 53.5% were 40–55 years old (mature faculty), and 35.5% were 55 years or older (older faculty). The majority of staff were professionals (61.6%, $N = 151$), and 38.4% were university teachers. A large number held PhDs: 51% ($N = 125$), while 37.6% held BA degrees, and an insufficient number percentage held diploma degrees (11.4%). There was tremendous variability in terms of teaching experience: 60.6% ($N = 57$) of participants had 13 years of experience or more while 39.3% of the faculty had less than 12 years of teaching experience. MDED provided faculty from different geographical settings: insular (80.4%, $N = 197$), national (14.3%), and foreign (5.3%). The overwhelming majority did not attend faculty development programs (78.7%, $N = 74$) and 21.3% received a type of academic support. To examine whether their MDED assessments were related with their social backgrounds, such as gender, age, professional position,

educational level, teaching experience, geographical setting, and development programs, Chi-square tests and the corresponding cross-tabulated tables were constructed. There was a significant association between males and females representing a weak association between variables (Cramer's $V = .258$), but the means of the two samples were equal (no significant difference). Also, there was a significant association between mature faculty and degrees (Cramer's $V = .167$). It was found that professionals valued the MDED teaching organization [t (3.479), $p < .001$] more than University teachers. A t -test also showed that professionals had a better understanding of student behavior (MDED process strategy) [t (2.175), $p < .000$]. Regarding degree types, faculty differed with respect to MDED teaching organization [$p < .002$ according to an analysis of variance (ANOVA)]. In determining which particular faculty degree groups have significant mean differences, post hoc Scheffé multiple comparisons were utilized, obtaining the expected BA degree faculty result. Levene's test was significant for staff development with respect to the way MDED information was managed [t (3.860), $p < .000$].

Table 2
Percentage of Strengths and Weaknesses in
MDED by Students and Part-time Faculty

Quality Criteria	Indicators	Students	Part-time Faculty
Leadership	Management	S=96,9%	S=95,5%
Program Guidelines	Relevance	S =95,2%	S=90,8%
	Coherence	S=88,3%	S=81,5%
	Adequacy	S=87,8%	S=88,1%
	Impact	S=82,0%	S=90,8%
Teaching Organization	Policies and Strategies	S =93,6%	W=71,2%
Human Resources	Part-time Faculty, counselors	S=63,6%	S=75,3%
Process Strategy	Teaching Methods	S=86,6%	S=93,2%
	Tutoring System	S=90,3%	S=90,4%
	Assessment	W=70,2%	S=84,3%
	Practicum	S=97,3%	S=93,6%
	Research project	S=91,3%	S=91,3%
Results	Satisfaction	S=89,3%	S=84,0%

Note. S= Strength, W=Weakness

MDED critical factors: two groups, and two sets of variables. The results in Table 3 show the critical factor loadings of the current MDED model according to the perceptions of two groups, postgraduates and part-time faculty, for two sets of variables (PSUQ and FMAQ).

Table 3
Two Factor Analyses in Two Groups

Factor loadings	Postgraduates	Factor loadings	Part-Time Faculty
Factor 1: 3,463	Labor Market Access	Factor 1: 6,530	Perceived Relevance and Pertinence of MDED
Factor 2: 3,143	Professional Competencies Learning	Factor 2: 5,466	Information Channel
Factor 3: 2,732	Inclusive Education Relevance	Factor 3: 4,977	Relationships with Executive Chief
Factor 4: 2,643	Perceived Usefulness of Information and Content	Factor 4: 4,114	Relationships with Students
Factor 5: 2,005	New Perspectives on Diversity	Factor 5: 3,791	Impact and Effects
Factor 6: 1,793	Program Structure	Factor 6: 3,612	Treatment for Abroad Part-Time Faculty
Factor 7: 1,584	Social Relationships	Factor 7: 2,726	Working Conditions Assessment
		Factor 8: 2,447	Teaching and Communication Resources
		Factor 9: 2,374	Professional and Research Competencies
		Factor 10: 2,314	Classroom Physical Conditions
		Factor 11: 1,172	Genuine Information Giving

Table 4
Linear Regression Results:
Postgraduate Satisfaction and MDED Structural Variables

<i>MDED Structural Variables</i>	<i>R</i>	<i>R²</i>	<i>F</i>	<i>gl</i>	<i>p</i>	<i>B</i>	<i>t</i>	<i>p</i>
Labor Market Access						.456	6.426	.000
Professional Competencies Learning						.312	4.474	.000
Perceived Usefulness of Information and Content	.733	.538	19.022	6.98	.000	.174	2.290	.024
New Perspectives on Diversity						.216	3.038	.003
Program Structure						.180	2.586	.011
Inclusive Education Relevance						.179	2.564	.012

Table 5
Linear Regression Results: Part-Time Faculty
Job Satisfaction and MDED Structural Variables

<i>MDED Structural Variables</i>	<i>R</i>	<i>R²</i>	<i>F</i>	<i>gl</i>	<i>p</i>	<i>B</i>	<i>t</i>	<i>p</i>
Information Channel						.453	10.399	.000
Impact and Effects						.366	8.419	.000
Working Conditions Assessment	.757	.574	43.243	7, 225	.757	.305	7.007	.000
Teaching and Communication Resources						.281	6.379	.000
Relationships with Students						.187	4.299	.000
Perceived Relevance and Pertinence of MDED						.132	3.031	.003

To explore the factor structure of the PSUQ in postgraduates and the factor structure FMAQ in part-time faculty, two factor analyses on the items were conducted. A Varimax orthogonal rotation followed the principal components analysis in both cases. Two criteria were used to analyze and interpret the factor analysis results and to determine the number of factors in the principal components analysis: (a) the root one criterion stating that factors with eigenvalues equal to or greater than 1 should be rotated, and (b) the scree test criterion by Cattell (1966) suggesting that factoring should cease when the plotted graph of the eigenvalues levels off, forming a straight line with an almost horizontal slope. should cease when the plotted graph of the eigenvalues levels off, forming a straight line with an almost horizontal slope.

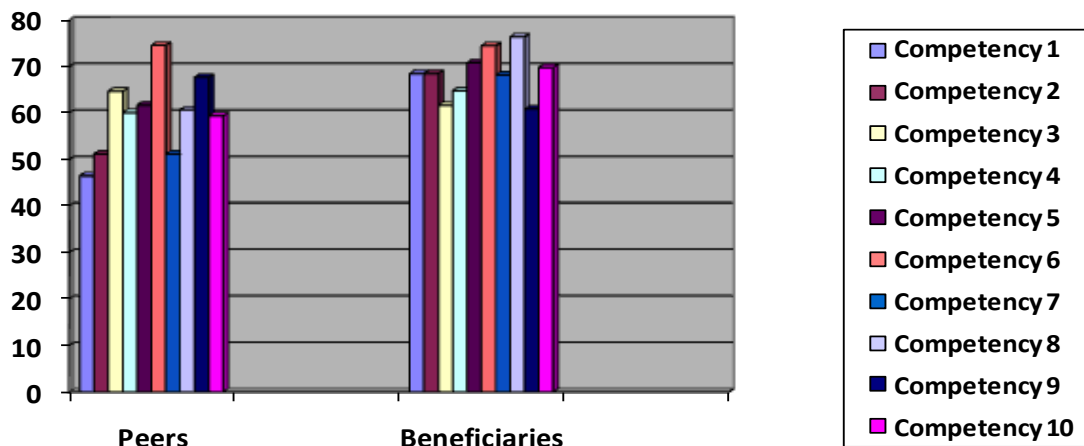
Because MDED organization ability requires that students, postgraduates, and part-time faculty at all levels engage in learning-based activities,

understanding why satisfaction occurs and the directions in which to implement changes are essential for MDED. To systematically examine the reasons behind postgraduates' and part-time faculty's expectations and satisfaction, several regression analyses were conducted. In the first regression model, the dependent measure was the continuous satisfaction variable, and the 7-factor loadings served as predictors (see Table 4).

In the second regression model, the dependent measure was also the continuous satisfaction variable, and the 11-factor loadings served as predictors (see Table 5).

Regression results are detailed in Tables 4 and 5. Together, the links between employee satisfaction and customer satisfaction that emerged from the regression analyses give the MDED model its empirical substance. As can be seen in Table 4, six critical success variables yielded relationships that fulfilled the customer

Figure 2
Perceived High Quality Use of Postgraduate
Competencies by Peers and Beneficiaries



satisfaction criteria for specifying what is required for a model to be reasonable (where $R^2 \geq 0$). Also, six independent variables from a set of variables were entered in the regression analysis that fulfilled the criteria of part-time faculty's intrinsic job satisfaction, reflecting again the goodness of fit of the model (where $R^2 \geq 0$) (Table 5). On the basis of these findings, we can now understand better the cause-and-effect linkages underlying our respondents' satisfaction perceptions.

Competencies critical for success. The response category 5 (best capability) of PAP and PAS-C was considered for descriptive analysis to indicate the respondents' attitudes and values regarding the 10 postgraduate competencies. Peer review is an alternative evaluation arrangement involving colleagues assessing the quality of their fellow teachers' competencies. The percentages shown in Figure 2 indicate that the majority of peers assessed 10 competencies as essential for postgraduates' success (above 50%). Specifically, 74.6% of peers considered that "postgraduates' formation has enriched them as professionals," giving "interpersonal skills" the highest rating for degree of competence practiced. Beneficiaries identified all competencies as critical for postgraduates' success. Particularly, 76.4% of respondents "observe that they [postgraduates] present a good attitude toward group work" when practicing "discernment of diversity, multiculturalism, and social marginalization." Beneficiaries of the community, adults (administrators and policymakers, hospital social workers, quality agency, and University personnel) and schoolboys and girls, have different opinions about the importance of the ten core competencies.

To determine the extent to which peers and beneficiaries (adults and schoolboys and girls) responded differently to the items of the questionnaire, an ANOVA was conducted for "social image" from several response items of PAP (items 6, 9, 10, and 11) and PAS-C (6, 9, and 10), the new construct being a dynamic perspective aimed at creating the conditions for observing how curricula and teaching practices are fostering social inclusion and influencing specific images of the future which are embedded in instructional and school practices. Thus, the dependent variable was the respondents' mean score on a subset of items, and the independent variables were the five-year analysis of all modules of the biennial MDED program, groups of boys and girls (aged 12–15) versus older children (aged 16 and above), and professional school role. Table 6 reported the results of a one-way ANOVA. Post-hoc comparisons using the Scheffé test showed that there were significant differences in the following variables: age, MDED biennial program review, and professional school role for social image.

Discussion

Revisiting the Research Questions

The essential point raised in this question centered on MDED playing a role in preparing for a special education career to ensure ongoing excellence in provision of SETs through meeting the changing demands of Canarian university standards. This question was also designed to examine the validity of

Table 6
ANOVA and Scheffé's Test Results for Social Image

<i>Scheffé</i>							
	F	p<	gl	Levels	N	M (SD)	p
Social Image	32,321	.000	2 946				
				Boys and girls	259	4.85 (.47)	.000
				Youngsters	249	4.40 (.84)	
				Boys and girls	259	4.85 (.47)	.000
				Adults	441	4.56 (.59)	
				Youngsters	249	4.40 (.84)	.000
				Adults	441	4.56 (.59)	
	40,111	.000	4 944				
				MDED edition 1	182	4.57 (.63)	.000
				MDED edition 3	227	4.86 (.36)	
				MDED edition 1	182	4.57 (.63)	.000
				MDED edition 5	168	4.11 (.60)	
				MDED edition 3	227	4.86 (.36)	.000
				MDED edition 4	137	4.54 (.60)	
				MDED edition 3	227	4.86 (.36)	.000
				MDED edition 5	168	4.11 (.60)	
				MDED edition 4	137	4.54 (.60)	.000
				MDED edition 5	168	4.11 (.60)	
	5,126	.000	5 943				
				GET	484	4.54 (.74)	.005
				Counselor	115	4.82 (.46)	

self-assessments for evaluating the quality of special educational interventions such as a master's degree. MDED engaged in a wide range of monitoring, reporting, management, and regulatory activities.

By investigating the reputation of MDED, this study only reveals program indicators' strengths for enrolled students and contracted part-time faculty. Similarly to other master's or university programs, part-time faculty and course offerings have been rated by students for each of the 10 years of MDED. Just as part-time faculty train SETs to evaluate their competence effectiveness with children, the special education part-time faculty at ULL consistently evaluates various aspects of MDED. Many important variables are related to the multidimensional construct of quality. To offer support and technical assistance to newly graduated teachers, as Lovingfoss et al. (2001) have suggested, adequate surrogate indicators of quality are needed. MDED can prepare graduates to accept teaching positions that are outside the parameters of their primary special education program preparation (diploma certificate) and for which they are not fully licensed. MDED matches graduate preparation and job assignment (Mastropieri, 2001). The relationship between master's degree quality and special education has received little attention, and few conclusions can be drawn so far. Billingsley (2004) argued that longitudinal studies of special education educators from their initial teacher training programs through their first

five years of teaching are desirable. The present longitudinal MDED study reflects graduates' commitment to competency teaching as a standard for SETs tied to districts' practices as a reform measure, which has been implemented in Canarian policy, as it has occurred in other states (McLeskey et al., 2004). To reform initial special training programs, a conceptualization of elements associated with quality has been proposed. Ordinarily, three components emerge from a quality model: structure, process, and outcomes. To be used as an excellence model, EFQM was the framework for continuous improvement of MDED. This approach to the master's degree stresses the concept that an appropriate management of students and part-time faculty within the postgraduate program was the key to success because structure and management processes would primarily impact the results of students, graduates, beneficiaries (as external customers), and the University (Calvo-Mora et al., 2005). Evaluation methods varied, focusing on indirect assessment techniques such as student satisfaction questionnaires and part-time faculty perceptions of the program scales (Brownell et al., 2005). In this study, we identify MDED's indicators of successful special education including meaningful leadership, rigorous program guidelines such as relevance, coherence, adequacy and impact, policies and strategies, human resources (part-time faculty, counselors), process strategies such as teaching methods, tutoring system,

assessment, practicum and research project, and quality satisfaction. These 10 criteria that we use to evaluate the MDED are represented by S, to indicate that the criterion is regarded as a strength, and W, to indicate a weakness. Other researchers have proceeded in similar ways to present criteria (Blanton, Sindelar, & Correa, 2006). Rosenberg and Sindelar (2005) concluded, among other eloquently expressed ideas, that special education teacher preparation is like an iceberg. This study has specified indicators for greater understanding of the nature and extent of MDED both above and below the waterline. We spent a considerable amount of time determining a general response database. This 10 year follow-up study examined the student and part-time occurrence rates that might have been of greater utility for monitoring. Assessment rates enabled a better understanding of students and part-time faculty concerning their own vision of MDED quality, and through the completion of instruments gave them an understanding of the strengths and weaknesses of some of the different components of the MDED structure. The most notable descriptive figure of MDED seems to be the total number of enrolled women and consequently of graduate women and the placement of women students in graduate training posts. The results also provided strong and consistent evidence that students were more likely to report perceptions of being against MDED assessment: i.e. meeting the criteria of a well-constructed portfolio (a collection of artifacts/examples of work documenting a person's competence and growth in the special educational program). Our approach also describes the part-time faculty in MDED: their numbers, gender composition, age, degree, occupational status, length of experience, geographical distribution, and the programs that trained them. Therefore, part-time faculty samples were scrutinized for evidence of quality criteria assessment.

Our second research question asked for the drivers of satisfaction that lead to retaining postgraduates and part-time faculty. To satisfy the needs and expectations of postgraduates or part-time faculty is not an easy university objective, as it is the postgraduates or part-time faculty who define quality rather than the University. Moreover, each postgraduate or part-time faculty member will define quality in a slightly different way depending upon his or her gender, age, education, and so on. Thomas and Galambos (2004) put it more bluntly: "General satisfaction is not the same as satisfaction with educational quality" (p. 257). To embrace the concept of MDED quality, the ULL needs to become increasingly customer-driven, responding to all master's degree postgraduates' or faculty members' needs rather than relying on their own perceptions of what a postgraduate or a part-time faculty member requires. This question demonstrates how two instruments can address a broad range of assessment

issues including job concerns, instructional values of the part-time faculty, learning of professional competencies, and particular dimensions of MDED. Reliability analysis confirmed the internal consistency of the two questionnaires. Students' perceptions of the importance of job access and learning professional competencies are similar to those found in other researches (Luckner & Sileo, 1984). These lists of students' 6 factors and part-time faculty's 11 factors represent conceptually meaningful dimensions related to their evaluation of MDED and impact on their subsequent professional experience. In particular, how well MDED factors helped postgraduates develop the capability to cope with various aspects of diversity was consistent with the findings of Delaney (1997). Also, a picture emerges from this analysis: postgraduates and part-time faculty endorsed MDED information as a "supportive cultural" factor (Brown & Reed, 2002). Furthermore, this question aimed to analyze more deliberately the impacts of MDED quality factors on postgraduates' and part-time faculty members' satisfaction. Each of the two equations presents the basic regression models: six causal effects for postgraduates and six part-time faculty effects upon the variable that they influence (satisfaction) were estimated. It is unsurprising that labor market access index makes the largest contribution to R^2 and the explanation of postgraduates' satisfaction, as other studies have found that the person-job fit index has contributed to job satisfaction (Ball & Chik, 2001). Finally, second question results show that postgraduates and part-time faculty did not appreciably vary in their assessment preferences.

Our third evaluation question asked about postgraduates' competencies according to peers and beneficiaries. Condensed MDED competencies were positively assessed by these two groups. The aim of MDED is to develop core professional competencies that will enable students to start their professional career successfully. Peers' and beneficiaries' responses ensured consistency and accountability across a manageable cluster of 10 competencies. Thus far, the results of this study depict the framework and foundation of MDED modules. Knowledge of peers' and beneficiaries' characteristics facilitates the usefulness of the competencies. Postgraduates' social image fosters realistic and recognizable descriptions of MDED competencies in professional situations. In one study, Lane, Givner, & Pierson (2004) asserted that "Teacher characteristics [are] predictive of teachers' perspectives" (p. 181). Based on the opinions of the respondents, peer GETs had different beliefs with respect to postgraduate competencies to school peer counselors.

Given the importance of evaluation done within university programs, this article provides a case on such

work. More importantly, it focuses on examining the MDED internal organizational program, processes and products.

Practical Implications

There are several implications of the proposed framework for master's degree quality assurance. The arrangements of five enablers and five results designed by MDED placed the prime emphasis upon indicators as careful statements that can apply to modules and other program components. Calibrating quality criteria across educational modules is intended to be concerned with exploration and discovering the boundaries of diversity and inclusion knowledge and understanding. Students should be able to demonstrate inclusion competencies which are at the forefront of the special education discipline. Core inclusion competencies are not measured by standardized tests. MDED prepares neither alienated executors of an inflexible curriculum nor behaviorally controlled task practices. This study provides quantitative support for the framework.

In addition to the proposed quality criteria and indicators, our findings suggest that positive perceptions of the framework by students and part-time faculty could make a positive contribution to postgraduates' sense of identification with MDED. The fact that grading was a weak indicator for students indicates a need to change students' operating definitions of assessment as a collection of information from a variety of sources (portfolio) in order to broaden their practices. Systematic adoption of master's degree competencies does not come easily. A general consensus regarding how to design and evaluate master's degrees does not yet exist in Spain. Now that the central government has placed greater emphasis on supporting graduate and postgraduate competencies, it is the responsibility of universities to include special education competencies in their overall mission and goals.

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Inquiry Based Method: A Case Study to Reduce Levels of Resistance

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This article is based on a case study exploring the effectiveness of inquiry-based method of teaching to reduce levels of student resistance to diversity issues and increase students' willingness to become activists. The case study draws from a one-year action research conducted in a Foundations of Education class. Data were collected through class discussions, informal interviews, reflective journals, papers, and observations. The results of the case study showed that application of the inquiry based method reduced levels of resistance and increased students' willingness to engage in activism. The results of this case study may be meaningful not only in the field of education but also in other fields of study that are presented with student resistance.

Teacher educators (Ladson-Billings, 2001; hooks, 2003; Thompson, 2004) have written extensively about student teachers' resistance in classes that seek to unveil institutional oppression of some groups in society. Ladson-Billings (2001) asserts that students manifest resistance to diversity issues in various ways, including the use of nonverbal communication such as silence. hooks (2003) also points out that if the professor teaching about social justice issues is a woman of color, as I am, such resistance is heightened, as many students perceive that professor as pushing her/his own agenda on them. Consequently, it is sometimes difficult to get students to move beyond resistance and sincerely engage with diversity issues. The purpose of this case study was to investigate the efficacy of the inquiry based method of teaching in reducing students' resistance to social justice issues and increasing students' willingness to engage in activism. The case study was undertaken over the course of one year in a Foundations of Education course that critically explores the social construction of schooling and how individuals within schools are impacted by larger social forces. Invariably, the course deals with issues of privilege and subordination within and outside of the education system.

Theoretical Framework

Constructivist and critical theories anchor the inquiry-based method of teaching for this case study. Constructivist theory is based on the assumption that learning is an active process (Dewey, 1938; Freire, 1970; Vygotsky, 1978) whereupon a student is not a receptor of information that she or he is expected to regurgitate at the end of the semester. Constructivist theory posits that students have to actively participate in the construction, deconstruction, and reconstruction of knowledge. It argues that the learning process should afford students with an experience, grounded in reality, that compels them to examine, form, and modify their

values and belief systems (Duffy & Cunningham, 1996). Modification of these beliefs is critical in the development of students and learning in general.

One of the vehicles for constructivist theory is the inquiry based method of learning and teaching. The inquiry-based method is premised on four primary notions: (a) that knowledge is constructed, (b) learning is a journey or a process, (c) students have experiences which impact learning, and (d) learning is an interactive process (Marcum-Dietrich, 2008).

Lee (2004) defines the inquiry-based method of learning and teaching as a "range of strategies used to promote learning through students' active and increasing independent investigation of questions, problems and issues" (p. 9). The questions or problems that the students investigate have to, according to Dewey (1938), emanate from tension between the student and the environment. This tension or disequilibrium between the student's worldview and the environment is an essential component for growth, learning, and reconstruction of experience (Dewey, 1938). Tension induced questions or problems constitute the first step of the method, followed by an investigation of the identified problem in the real world context. Investigation of the problem entails students testing their hypothesis or beliefs.

Critical reflection also plays a salient role in the inquiry-based education. When students are investigating their questions or problems, they have to critically reflect on their old and new experiences (Plowright & Watkins, 2004). Freire (1994) points out that inquiry-based method of teaching and learning divorced from critical problem analysis and reflection does not offer students an opportunity to be agents of change and transformation. Instead it merely allows them to ruminate over the problem without any willingness to take action toward solving it. Echoing Freire's assertion, Lutterman-Aguilar (2004) posits that inquiry based education "without critical analysis and reflection is not experiential education; it is simply

experience” (p. 1). Therefore, the inquiry-based method of teaching has to be coupled with critical reflection on how students are positioned as both agents and victims of oppressive structures and their role in transforming those structures.

By requiring students to engage with the real world and society, the inquiry-based method affords students with “opportunities to learn through inquiry rather than simple transmission of knowledge, training in the skills necessary for oral and written communication...and opportunities to interact with people of backgrounds, cultures, and experiences different from the student’s own” (The Boyer Commission, 1998, p.12-13). Being able to interact with individuals who have had different experiences from theirs, students can see the world “as another would see it” (Dewey, 1916, p.5) so that the “other” person’s vantage point can be understood and appreciated. Seeing through another person’s lenses is what Lutterman-Aguilar calls (2004) “border crossing” in terms of race, ethnicity, nationality, economic class, gender, sexual orientation, religion, and ability, which is fundamental to an educative process in courses that deal with diversity issues. Sleeter (1993) cautions that “border crossing” alone, however, is inadequate as it can reinforce stereotypes and replicate positions of power and subjugation. For example, in a study of white pre-service teachers who student taught in schools populated by students of color, she found that the stereotypes that the white pre-service teachers held about students of color prevailed after “border crossing”.

Leistyna (1999) also reported that most diversity courses use cursory forms of “border crossing” by only exposing students to cultural artifacts and foods from cultures dissimilar to theirs. This part of learning reifies the us/them dichotomy. For instance, when students take a trip to Chinatown, they are engaging in a form of border crossing, but, as Sleeter and Grant (1988) pointed out, “this is no guarantee that they will learn about issues such as the poverty in Chinatown or the psychological devastation that many Asian immigrants face” (p. 13). The inquiry-based method requires that students avert reinforcement of such stereotypes by remaining in dialogue with the instructor and fellow students about their new experiences. Such dialogue allows students to critically reflect on their experiences and avoid pitfalls of “border crossing” that may lead to the reinforcement of stereotypes.

Another theory that was foundational to this case study is critical theory. Central to critical theory is the notion of *conscientization*. According to Freire (1970), *conscientization* is critical cognizance of economic, social, cultural, and political attributes that shape human relations. Such cognizance requires that a student locates herself or himself within social and historical antecedents. When she or he has done that,

she or he may begin to see how her or his position facilitates or/and thwarts democracy. Bartolome (1994) also speaks of the relevance of critical consciousness. She points out that critical consciousness, or what she calls political clarity, can only exist when a person recognizes that she or he is shaped by her or his location in a hierarchically structured society. That political clarity will then propel an individual to work toward dismantling of structures that make her or him an agent of oppression and/or a subject of oppression. Without political clarity, Bartolome argues, one cannot move toward transformation of oppressive structures.

Both constructivist and critical theory call for authentic forms of learning. They both postulate that authentic learning is anchored by inquiry into real life issues, critical reflection, and, in case of critical theory, consciousness. The inquiry-based method of learning and teaching is a medium for authentic learning as it is based on the investigation of real life problems anchored by critical reflection (Dewey, 1938).

Methods

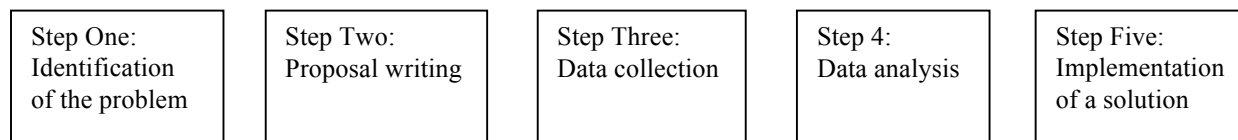
Course Background and Participants

The case study draws from a Foundations of Education course that deals with history, philosophy, and overarching issues of social justice in education. The course is designed to introduce student teachers to the impact of macro social forces and ideologies on education. For instance, students explore the impact of capitalism as a social force on public education in the United States. The overarching aims of social justice education, which entail educating for a non-oppressive society regarding race, gender, sexual orientation, class, and ability, formulate the framework of the course.

Students take the course to fulfill a general education requirement for a teacher certification program. They register for the course either in their second or third year of college. Similar to national teacher education demographics, the majority of the students in the course were white women who self reported to be middle class (Wasonga & Pivoral, 2004). In the two classes that inform this case study, which took place over a year, there was one woman of color; the rest of the students were white. A total of 50 students participated in the case study.

Primary textbooks for the course were Loewen’s (1995) *Lies My Teacher Told Me: Everything Your American History Textbook Got Wrong*; Hooks’ (2000) *Feminism is for Everybody: Passionate Politics*; and Tyack’s (2007) *Seeking Common Ground: Public Schools in a Diverse Society*. Articles relevant to the themes discussed in class, for example, McIntosh’s (1996) “White Privilege and Male Privilege” and Thompson’s (2003) “Tiffany: Friends of People of Color” on the theme of white privilege, supplemented primary readings.

Figure 1
Five Step Inquiry Process



Assessment in the course was based on fulfillment of required assignments, which included investigating a problem assigned in class using a five-step process of (a) identifying a problem, (b) proposal writing, (c) data collection, (d) data analysis, and (e) implementation of a solution. In addition to the inquiry, students were to keep reflective journals. Formative assessment and guidance were provided to students throughout the semester; summative assessment was given at the end of the course. Grading was based on fulfillment of the assignment requirements, which meant completion of the five steps of the inquiry-based model, and work that displayed well-informed and potent analysis, originality, and thoughtfulness. Students were not graded on whether levels of their resistance were reduced or not reduced.

This case study was action research based. Mertler (2009) defines action research as “any systematic inquiry conducted by teachers, administrators, counselors, and others with a vested interest in the teaching and learning process or environment”. Action research involves identification of a problem within the classroom and taking measures to ameliorate that problem. In the case study, the problem was identified as high levels of resistance in the classroom. The instructor is an immigrant African woman who speaks with a foreign accent, a relevant element to the discussion given that the nature of resistance experienced by educators of color can be different from resistance experienced by instructors from the dominant group, particularly when race, gender, and culture intersect (Ladson-Billings, 2001; Thompson, 2004). The instructor had experienced a lot of resistance from students in a similar course in the past (Sommers & Fasching-Varner, 2008) exhibited through what Amobi (2007) calls volatile conversations, spiteful silences, and general unpleasantness in the classroom. She undertook action research in order to reduce levels of resistance and help students better understand issues of social justice.

The instructor undertook this action research case study in search of methods of teaching and learning that would reduce resistance to issues of diversity and provide authentic learning opportunities for students. The inquiry-based method was used as an intervention strategy to reduce levels of resistance using action research as a vehicle to improve pedagogy and student learning (Burnaford, Fischer, & Hobson, 2001).

Data Collection Methods

Data collection methods used were class discussions and informal interviews, students’ reflective journals, papers, and observations. In addition to discussing readings and the impact of social forces on schooling, the classroom served as a platform for debriefing on the students’ projects. I also informally interviewed students about their projects and experiences once a month when we met for individual conferencing.

Students submitted reflective journals fortnightly; they wrote about their experiences and how these experiences provided (or did not provide) a deepened understanding of social forces discussed in the classroom. Miles and Huberman (1994) contend that reflective journals are data sources that provide an in-depth understanding of students’ shifts in knowledge and understanding levels.

I also conducted observations of students’ body language during classroom discussions throughout each semester in order “to learn firsthand how the actions of the participants correspond with their words, and see patterns of behavior” (Mertler, 2009, p.80). Data were collected for one year (two semesters) from two different sections of the course.

Findings

The students engaged in a five-step inquiry process (Figure 1), namely, identification of the problem, proposal writing, data collection, data analysis, and implementation of the solution. According to Dewey (1938) and Freire (1970), the latter step – implementation of the solution – is critical for students to engage in so that they are aware that they have power and ability to enact change within their communities and society.

Step One: Identification of the Problem

The first step in this process involved problem identification. I facilitated this process by observing students’ resistance in class. During class discussions, students often would object, verbally or/and non-verbally, to the existence of an injustice. For instance, when we were discussing marginalization of women in

society, some students would disagree that women were marginalized in any form; the following are typical responses from class discussions and informal interviews:

I can understand that women of my grandmother's age and maybe my mother's age felt oppressed; my generation – let me speak for myself- I do not feel oppressed in any way. I feel that there is a lot of bias toward males merely because they are males. We give them such a hard time and expect perfection from them.

I think men have it harder than women because, at least for us, we [women] are not really expected to succeed in both our careers and our private lives. For men they have to excel as providers and as fathers. The pressure is more for them [men] than us [women].

I'm sorry, but I am not oppressed. An oppressed person cannot make decisions about what she wants to do, where she wants go, any decision regarding her life. I make all my decisions; no man makes decisions for me. I am an independent woman, and I would argue that most of us here in the United States are [independent].

The few males in both classes were mostly silent when discussing issues of women and their marginalization, often nodding in concurrence with women who asserted that the notions of women's oppression and feminism were anachronistic. When I asked the classes if any of them perceived themselves as feminists, two out of 25 students in the class, a woman of color and a white woman, during the first semester class raised their hands. In the second semester class only one woman out of 25 students raised her hand.

When discussing issues of racial subjugation and domination, students were not as vociferous as they had been when discussing marginalization of women in the society. However, their nonverbal forms of communication indicated resistance. Silence was one way resistance was communicated, as Ladson-Billings (2001) also found in her study; other forms of resistance included rolling of eyes, students looking at each other in disbelief, constantly looking at the clock in the room, and uncomfortably shifting in their seats. Verbal resistance included statements like "people like to use the race card whenever it is convenient." The question was posed as to how many students considered themselves to be racist; none of the students in either classes raised their hands. This was not surprising, as Bonilla-Silva and Forman (2001) assert that white students never

perceive themselves as being capable of racism. In class discussions about race, some students would often preface what they had to say by stating "I hope I am not saying the wrong thing but..." or directing their comments to me, "Don't take this personally..." My identity as a black person seemed to be more dominant to the students and served as an inhibitor more than my gender as evidenced by their willingness to engage or disengage in the discussion about race.

Similar to gender, students seemed to be willing to acknowledge and verbalize their homophobia when it came to issues of sexual diversity. My position as a heterosexual woman made them less inhibited in discussing issues of sexual diversity. One student stated:

I do not want to offend anyone; actually there is a dude in my dorm, in my floor who is gay and I get along very well with him; but I must say that I am a religious person and I try to live according to the instructions of the Bible. So to me, this discussion seems to be against my religious beliefs and what I have been taught as right and wrong. It's like the Columbus story I guess; for 12 years when I was in school he was a hero and then when I am older I am supposed to criticize him. I don't know; it seems like in a way you [the instructor] are telling us what our parents have taught us is wrong. That just does not sound right to me. That's who I am.

This student's resistance was rooted in the perception that I was attacking his belief system and identity. Such resistance emanated from students viewing issues from their own perspectives.

Students were assigned to investigate issues about which they were most resistant. For example, the student who was most resistant to the existence of homophobia was assigned to investigate homophobia on campus. There were other students in both classes who wanted to investigate homophobia albeit they did not explicitly exhibit resistance to issues of sexual diversity. Out of 50 students, five male students investigated homophobia on campus by setting up information tables on gay, transgender, lesbian and bisexual (GTLB) individuals. Thirty students wanted to engage in a college awareness program in an urban school to investigate institutional racism against students of color. Twelve students (all women) sought to investigate if sexism still existed. Three students wanted to investigate discrimination against recent immigrants and refugees from Sudan who live in the community. Table 1 shows the numerical distribution of student inquiries.

Table 1
Distribution of Student Inquiries

Number of Students	Inquiry Investigated
5	Existence of homophobia on campus
30	Evidence of institutional racism in urban high schools
12	Existence of sexism
3	Evidence of discrimination against recent immigrants

Students were eager to undertake the inquiry because, as one student pointed out in her journal, “they wanted to show me that they were correct.” In sum, all students in the class were assigned a question to investigate based on their levels of resistance; they then had to write a proposal about how they were going to investigate the problem.

Step Two: Proposal Writing

Upon identification of the question or problem to investigate, students were required to provide a proposal as to (1) how they would investigate the problem and collect data, (2) sites for data collection, and (3) if they found evidence of discrimination, what actions would they take to mitigate the situation; if they found evidence of lack of discrimination, what were they going to do to apprise the rest of the student body of their findings. For instance, the students who believed that the notion of gender inequality was anachronistic proposed to conduct internet research on gender equity *vis a vis* (a) salaries, (b) number of women who occupied the highest office in the workplace versus men, (c) college attendance and graduation, and (d) general opportunities available to women. They were also going to interview their fellow college students and members in their communities on issues of gender discrimination. For implementation of the solution, they proposed that they would increase awareness of gender equity/inequity, depending on their findings.

The students who believed that recent immigrants and refugees were defiling the reputation of the community in the media by saying that the community was hostile toward them proposed to volunteer at a local centre that catered to immigrants by offering English lessons. They worked as English tutors in order to gain access to the population whose experiences they wanted to investigate. As part of implementation of the solution, these students proposed to disseminate the information collected from these interactions and increase awareness of either existence or nonexistence of discrimination based on their findings.

Steps Three and Four: Data Collection and Analysis

The third step entailed the execution of the actions in the students’ proposals, while step four was analysis of data collected. As students were in the process of

both data collection and analysis, they shared their preliminary findings with their classmates during class discussions. It was clear from the beginning of the data collection step that the students investigating gender equity issues were not finding data that confirmed their hypothesis; as a group they reported that their electronic research was not “supporting our views, but we have not completed our data collection yet,” as one student pointed out in her journal. They seemed to be still convinced that their views were correct regardless of what preliminary evidence showed. According to Thompson (2004), such resistance even in the face of counter evidence is not uncommon as lifetime beliefs and ideologies cannot be expunged within a short span of time. These students believed that perhaps with more knowledge and research they would find factual evidence that women are no longer marginalized.

Similarly, students who were in the urban schools experienced some dissonance between their views and findings. One student wrote:

It is clear that schools are not the same. This school looks nothing like my old high school, students are unruly and loud. Even if I went to a high school like that I do not think I would be as loud and unruly as these students are; there is no excuse for rudeness.

Another student wrote:

Students have no respect for authority figures, and curse without any shame. I am starting to think they are getting what they deserve. I believe if they behaved in a respectful manner, the government will also give them suitable buildings and amenities.

While acknowledging structural inequalities that they encountered in urban schools, these students focused on the non-normative behavior of urban students as problematic and therefore deserving of inequities.

Students investigating discrimination (or lack of discrimination) against immigrants seemed to withdraw from class discussion and were not as vociferous as their classmates. One of these students wrote in his journal, “I am surprised, shocked, and embarrassed by what these people have to go through.” It was evident that his interactions with the immigrants had led him to believe that the community that he had previously thought was accepting and non-discriminatory was actually psychologically hostile to immigrants and refugees of color. This exposure had made him withdraw in class discussions because he was, as he reported in an interview, “trying to digest all of this.”

Another student also investigating discrimination of immigrants wrote in her journal:

I understand that people come to the United States for various reasons, but I wonder if I would go to another country and expect to be treated as one of the citizens. Wouldn't that be too much to ask? I don't believe anyone should be discriminated against. However, no one should expect to go into a different culture and expect people of that culture to adapt to his culture. He should adapt to the culture of his new country.

Parallel to the experiences of students in urban schools, this student was acknowledging that discrimination exists, but she focused on the recipients of discrimination as also culpable. She even went further to state that she is opposed to discrimination but that immigrants need to assimilate into society and have lowered expectations regarding humane treatment.

The five students who were investigating the problem of homophobia became exposed to GTLB students on campus who came to their information table on GTLB issues. One student wrote in her journal:

The gay students on campus seem to feel safe coming to us and talking about homophobia. I do not know them but they seem like decent people, I have no reason to distrust what they are saying. I am just disappointed that not many heterosexual students want to spend time talking to us like the GTLB students. They just pick up the flyers and go. The fear is real because I am starting to think that some people might think I am gay because I am doing this.

Another student reiterated the sentiment that he does not want people to think he is gay because of the project. When I asked him why this engendered such a fear in him, he said he feared it would "ruin" his reputation.

As the semester progressed, most of the students were becoming convinced that discrimination against some groups in society prevailed. For some students who were in an urban school setting, however, the lure of stereotypes seemed to serve as justification for institutional discrimination. For example, one student pointed out that high school students were "lazy" and therefore deserving of what they saw as an inferior education because "they will never make it in a regular [in a white middle class community] school." We spent a lot of time in class debunking some of the myths that students had about students of color and their parents. Bonilla-Silva and Forman (2000) assert that white students have a tendency to perceive themselves as racially open and accepting, when in actuality they harbor many of the myths that are cornerstones of racism. Students' comments in the classroom were reflective of such a tendency.

As the semester was concluding, many of the students were finding that evidence from real life did not support their hypotheses. For instance, students who believed that gender inequality was no longer a problem found that their hypothesis was disconfirmed. The results of the survey that they gave to campus students to discern if their peers believed that gender inequalities persisted showed that most male and female students – 85 % - on campus believed that gender inequality existed. Moreover, they found that most female students (63%) reported to have been direct or indirect targets of gender discrimination, and 77% of male students on campus reported to know someone who had been discriminated against on the basis of gender. Additionally, electronic research yielded results on salary differences based on gender; they discovered that women were chronically paid less than men, more so for women of color "even with affirmative action in place," as one student pointed out. Their research revealed to them what Hill-Collins calls (1990) intersectionality of race, sex, and class.

All of the students who investigated marginalization of recent immigrants and refugees in the community confirmed existence of discrimination. One student shared a turning point for him that involved a 12-year-old boy who wanted to break a five-dollar bill in order to use a vending machine at a community center:

He went to the clerk at the front desk to ask for change and the clerk (white middle aged woman) told him there was not any change and they did not keep money there. When he told me what the clerk said I decided to go there myself. The lady asked me if I wanted ones or coins. I did not say anything to the lady but I began to see my community through his [the boy's] eyes; it was not welcoming.

Another student reported that when she was accompanying two women who were wearing *burkas* to the license bureau to take the learner-driver exam:

Two older white males in line started talking about how can this country allow people who are killing our boys in Iraq to be here. This made me uncomfortable but I hope that the ladies did not hear the conversation.

These two students had opportunities to see the world from another person's vantage point (Dewey, 1938). It was through interacting with the immigrants that they were able to understand the challenges the immigrants face in the community.

Twenty seven students whose inquiry was in urban high schools also reported changes in their belief system. One student wrote:

I was in Mr. X.'s class and saw how unhappy he was with his job and his students. I think because I am white he was comfortable enough to tell me that educating 'these kids is a waste of taxpayers money because they will end up either dead, in jail, or strung out in a few years.' Mr. X. has made me realize that as a teacher I can be for/against institutional racism. I am against it and more determined than ever to work in urban schools.

For this student, it was the interactions that she had with a teacher who was overtly racist that made her realize that individuals are active participants in supporting and upholding institutionalized racism.

Overall, reduction of levels of resistance was evident for most students. The inquiry-based method allowed students to actively investigate forms of discrimination that they thought did not exist or were inflated. Upon investigation of these problems, they reached the conclusion that the forms of discrimination (i.e. gender inequalities, discrimination against immigrants, homophobia, systemic marginalization of students in urban schools) existed and were not as inflated as they had previously assumed. However, three students who investigated discrimination in urban schools found that discrimination did not exist. One student reported that students and parents were responsible for low achievements as this reflected "the natural order of people." Two of the students maintained that the hierarchical economic system and parallel school funding formula were justified in order to preserve the system of capitalism. In other words, they could not imagine an equitable education system that did not correspond with the inequitable economic system.

Step Five: Implementation of Solution

After the students completed their data analysis they had to act on their findings. The students who investigated gender discrimination disseminated information about prevalence of gender inequalities through (a) holding a campus forum, (b) posting signage around campus on discrimination, (c) hosting two movie nights to be followed by a discussion of portrayals of women and men in movies, (d) developing a web site dedicated to raising awareness, and (e) signing a petition calling for an end to gender inequality. The petition was submitted to a local mayor. The students completed these assignments with enthusiasm and vigor.

The students who investigated existence of homophobia on campus approached student organizations on campus asking to attend their meetings and discuss how the campus could be made safer and more welcoming to GLTB students. As a result, one of

the organizations invited an outside speaker to give a lecture on how to create a GLTB friendly climate. It must be pointed out that the students also experienced a lot of resistance from at least two organizations on campus when they were presenting their findings— in one meeting, one of the students was physically pushed out of the room. In an interview, the student who was pushed out of the room said "this shows that change cannot be achieved without making some people unhappy and even angry enough to put their hands on you."

Students who had doubted that immigrants were targets of discrimination engaged in activism by personally visiting areas that some of the immigrants frequented, such as the community center, and passing out flyers detailing forms of discrimination that they had witnessed. One student reported that "people at the local community center were actually surprised by our findings and promised to be more conscious of this when dealing with this population." They also were included in the town's council meeting to discuss various ways the community could be welcoming and less discriminatory toward immigrants.

Students who were at the urban high schools implemented solutions that ranged from micro-level solutions such as conducting pencil and paper drives to address immediate needs in the classroom to seeking macro-level solutions by writing letters demanding reforms in the school funding formula. Letters were sent to the senators, and some students sent letters to the national Secretary of Education. The three students whose beliefs were unaltered held a forum on campus, which became a lively discussion as the people who came to the forum (mostly students from the class) passionately attempted to disprove their assertions.

Completing the last step of the inquiry-based method propelled students to engage in what Freire (1994) and hooks (2000) call agency. According to Freire (1970), students need to know that if schools and institutions are socially constructed, they can be socially reconstructed for realization of social justice. By engaging in the last step, students viewed themselves as part of the society's problems and solutions. They became aware that discrimination is socially constructed and therefore can be socially dismantled. Freire (1994) asserts that students' cognizance of their power to be agents of change is critical in development of a democratic citizenry.

For my action research, I learned that the inquiry-based method is instrumental in reducing levels of student resistance to social justice issues. However, I cannot claim causality between the inquiry-based method and reduced levels of resistance, as this was not an experimental study. Nevertheless, I can assert that the combination of students' ability to investigate a problem, engage in critical reflection, read social justice education material, and engage in class discussions was effective in reducing levels of resistance.

Even the three students who were not convinced that institutional discrimination played a role in the (under) education of the students in urban schools were able to engage in discussions in a constructive manner, as they had evidence from which to extrapolate. The inquiry based method therefore provided students with an ability to concretize theory regardless of whether they agreed or disagreed with it. The ability to make such connections yielded fruitful discussions; the silences and non-evidence based myths that I usually experienced in the classroom vanished.

Conclusion

Inquiry based method of teaching places students at the center of their learning. Students are positioned as chief investigators of phenomena, while the instructor serves as a guide or facilitator. Using an inquiry-based method allowed students to engage deeply with issues that they were investigating. This case study was aimed at improving my teaching and student learning by reducing resistance levels and increasing students' willingness to engage in activism. The findings showed that through the inquiry-based method of teaching and learning, 47 out of 50 students were able to re-examine and transform their previous knowledge on certain diversity topics. They were able to juxtapose their knowledge forms against their findings and then re-adjust their own knowledge.

Such readjustments were critical in the reduction of resistance and were possible because the inquiry-based method positioned students as owners of knowledge. They independently investigated effects individual and institutional discrimination. They also came to understand how their identities shaped their world-views and the importance of seeing from another's vantage point (Dewey, 1938). When students see the world from various perspectives, Steinberg and Kincheloe (1998) assert, "[they] set the stage for a long running, meta-dialogue with themselves. This inner conversation leads to a perpetual redefinition of their images of both self and world" (p. 15).

In the classroom, there was an elevated sense of knowledge ownership, which resulted in vibrant and passionate discussions. Congruent with the inquiry-based method, students became "experts" and owners of knowledge. As one student put it in her journal, "it is one thing to hear your professor say it or read about it, and it is another to investigate it and find out yourself. It makes it more real." Being investigators provided them with an opportunity to make connections between theories and texts discussed in class and their experiences. Making these connections on their own and gaining an understanding of the hidden role of institutions—schools in particular—in the reproduction, marginalization, and privileging of some members of

society allowed students to have in-depth exchange of ideas, even when they disagreed. Employing inquiry-based method created an environment in which students could exchange ideas and engage in in-depth discussions as owners of knowledge. The inquiry-based method would therefore be appropriate for faculty in other disciplines seeking to improve student engagement in class discussions.

The inquiry-based method also propelled students to move beyond knowledge production to activism because implementation of a solution was incorporated into the five-step process. This eagerness for some was because they genuinely wanted to be social change agents. Some students continue to be actively engaged in the issues that they investigated in the course. For example, the students who investigated marginalization of women are still involved in feminist issues on campus and proudly call themselves feminists, a term they initially frowned upon. For the majority of the students, however, social agency ended after the course.

As effective as the inquiry-based model of learning and teaching was in the reduction of resistance, it was clear that complete transformation of students did not take place. For instance, the student who investigated homophobia was still concerned that activism against homophobia would "ruin" his reputation as a heterosexual man; his concern shows that activism without complete conscientization is problematic. The inquiry-based method is therefore not the panacea or the solution for teaching social justice issues. It is, however, a vehicle for students to confront their truths, see various vantage points, experience cognitive dissonance, and reduce levels of resistance.

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Exploring Leadership as a Phenomenon in an Educational Leadership Paper: An Innovative Pedagogical Approach Opens the Unexpected

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Neoliberal ideologies influence both the content and pedagogical approach of educational leadership programmes. This article proposes an alternate pedagogy, one which privileges the experiential nature of the leadership and challenges students to critique prevailing ideologies within education. The authors describe the reshaping of a compulsory, foundational academic paper within a Masters of educational leadership programme to focus on the phenomenon of leadership more explicitly. They illustrate the use of student stories and hermeneutic interpretation to deepen the appreciation of the contextual nature of educational leadership practice. The authors suggest that the influence of this pedagogical approach resides in the sincerity of the pedagogical comportment of the teaching faculty and the elusiveness of the taken-for-granted nature of leadership. They conclude that pedagogical processes that maintain a centrality of concern for the humanity of leadership experiences are a matter of urgency in our present educational context.

In this article we advocate for an alternative pedagogy in educational leadership programmes and papers. Initially, we consider mainstream pedagogical practices in educational leadership programmes and note, in particular, the invasive influence of the predominant neoliberal ideology on education. After locating ourselves and establishing the context for this article, we outline an alternative way of thinking about educational leadership and an alternative pedagogical approach that focuses on students' personal recollections and associated hermeneutic interpretations of these leadership experiences. The facilitation of this hermeneutic process is illustrated by students' stories and excerpts from their interpretive writing. This article identifies a range of implications that call for a critical response from educators teaching in leadership programmes. Our position is that being a leader is more than the knowledge of, and the skills for, leadership. As such, alternative pedagogical approaches that call for holistic responses humanise the task and project of leadership in practice.

Current Approaches in Educational Leadership Programmes

Current approaches to educational leadership programmes appear to be structured in a way that reflects the prevailing and predominant ideology (Bourdieu, 1973). Presently, the predominant discourse is located in an ideological backdrop known as economic rationalism, or the New Right (Codd, 1996, 1999, 2004, 2005; Grace, 1991; Lauder, 1987; Snook et al., 1999). Positioning education as a private good, this ideological discourse favours individualistic approaches to education, reduces curriculum to measurable and rational outcomes, and casts educational leaders as managers of small businesses. This invasive neoliberal ideology can be found systemically and is expressed in

current educational practice as managerialism, performativity, market theory, and choice theory (Alphonse, 1999; Codd, 1996; Pollitt, 1990; Thrupp & Willmott, 2003). In this Darwinian environment, schools are perceived as individual entities and forced to compete for scarce educational resources. Concern for social justice and the holistic emancipation of students, schools, and communities is of little concern.

Under this ideological influence, priority in educational leadership programmes is given to academic traditionalist objectives involving increased knowledge and understandings in the first instance and the development of particular skills deemed pertinent to the topic in the second. As such, strategic planning, capacity-building, leadership development and other leadership responsibilities are objectified towards linear, albeit conceptual, understandings devoid of the problematic, contextual, and experiential nature of leadership (Begley, 2001; Brundrett, 2001; Bush, 1999; Cardno, 2003; Codd, 2005; Creissen & Ellison, 1998; Johnson, 1994; Millken, 2002).

Concern for matters of character, disposition, attitude and the like are problematic to this ideological paradigm (Begley, 2001, 2003, 2006; Bhindi & Duignan, 1997; Luckock, 2007; Starratt, 2007; Stevenson, 2007; Walker & Shuangye, 2007). The relationship between the teacher (lecturer) and the tertiary student (emergent leader) is utilitarian in nature; that is, technicist approaches to learning remain fixated on the efficiency of the delivery of content more so than the personal and professional formation of these emergent leaders (Alphonse, 1999; Carr & Harnett, 1996). Ironically, some current programmes and papers purport to critique current educational leadership practices and its ideological backdrop, advocating for greater contextual awareness and wisdom, while doing so in a transactional, technicist mode of delivery. These programmes and papers appear to privilege

theory over practice as well as theory over the experiential nature of educational leadership.

The implication of the ideological underpinnings in educational leadership programmes and papers is the privileging of rationalist argument, understanding, and skill development at the expense of other contemplative and deliberative approaches to learning (Johnson, 1994; Restine, 1997; Shor, 1992; Southworth, 1995). As such, the predominant ideological discourse continues to be legitimated and systemically sustained (Barnett, 2003; Giles, 2005; Giroux, 1981; Meighan & Siraj-Blatchford, 2003). The learning process, as a consequence, tends towards a replication of the teacher's (expert) understandings as opposed to the possibility of transformative personal and professional outcomes of an experiential kind (Carr & Harnett, 1996; Hare, 2005).

Anecdotal observations from our previous teaching experiences suggest that the present ideological regime constrains intellectual inquiry through pedagogical practices that seek to provide answers, sanitise contextual concerns towards linear and causal relationships, apply theory to practice as if this is our normal experience of leadership, and avoid the problematic nature of human and relational contexts.

Locating Ourselves as University Lecturers in an Educational Leadership Programme

Critical, postmodernist and feminist traditions in education call for those that speak to locate themselves (Freire, 2003; hooks, 2000, 2003). This article represents our particular 'voice' on the nature and possibilities inherent in educational leadership programmes. As co-authors of this article, we identify a number of pertinent personal and professional experiences that 'locate' us as educators. We readily acknowledge that our pre-assumptions influence how we see the 'essence' of leadership and the nature of programmes that might equip emergent educational leaders.

As university lecturers, we currently teach in the same university and co-teach a compulsory foundational educational leadership paper, the subject of this article. We bring to this role extensive teaching careers, having variously been involved in the primary, secondary and tertiary sectors of education. We have held a wide range of educational leadership roles, including Head of Department, Deputy Principal, and Dean of Education.

We hold the position that the 'experience' of being an educational leader is as critical as our understanding of the nature of such leadership. Indeed, we readily express our commitment to relational, contextual, and ecological approaches to leadership in education. As such, our concern for educational leadership starts with

an affirmation of the relational nature of our humanity and the fundamental respect afforded to every person, regardless of role. Such a position focuses on the relational nature of leadership more so than a preoccupation with the power relations inherent in leadership. Our commitment and priorities on a daily basis also show the critical importance we give to the development of innovative understandings that might open the essence of leadership towards greater expression and embodiment.

An Alternative Way of Thinking About Educational Leadership

Traditionally, it would appear that the pedagogy within educational leadership programmes has been largely transactional, didactic and generic, with the academic content being determined and delivered by faculty perceived to be theoretical experts. Our starting point for thinking and teaching educational leadership papers is that leadership is a phenomenon. Leadership is not firstly a concept, role, position or power, but a phenomenon. While students might expect tidy concepts, constructs, and understanding, we propose that, as a phenomenon, there is an essence to leadership that is not definitive (Lawler, 2005). Such an essence exists but is difficult to define. While we 'experience' leadership and feel as if we 'know' about leadership, all the while the essence of leadership escapes us in relational experiences occurring between people in an educational context.

A further consequence of seeing leadership in this way is the 'uncertain' nature of this phenomenon. Indeed, some would suggest that the experience of leadership is atypical, contextual, situational, and always/already in flux relationally. Importantly, we notice the increasing body of literature that affirms the 'authority' of a participant's experience of education (Dinkelman, 2003; Hamilton, 1998; Louie, Drevdahl, Purdy, & Stackman, 2003; Munby & Russell, 1994; Sandretto, Lang, Schon, & Whyte, 2003; Schuck & Segal, 2002). With leadership as a problematic and experientially messy phenomenon, the educational process must now value the dialogue which opens such a phenomenon for new thinking (Bohm, 1995, 1996; Bokeno & Bokeno, 1998; Heifetz, 1994; Lambert, 1998).

We aspire to facilitate and engender academic dialogue and inquiry that calls for thinking and deepening considerations of the essence of leadership (Cam, 1995; Diekelmann, 2003; Heidegger, 1992; Ironside, 2003; Lefstein, 2005; Lipman, 2003; Smythe, 2004; Smythe & Norton, 2007; Zeichner, 1994). Students (emergent leaders) need to be provoked towards a comfort in 'apparent ambiguity,' confident in not having to have 'right' answers prior to their

impending experience of leadership, and sensitive to the embedded layering of leadership praxis. We hope that such an educational experience will influence the student's way-of-being as a leader. It is our intention that examining the essence of leadership in dialogue with students provokes a greater humaneness in the role and practice of leadership, both in this course and in the participant's future leadership endeavours (Giles, 2007).

An Alternative Pedagogical Approach Within an Educational Leadership Paper

In re-shaping this compulsory foundational paper, we introduced changes to the teaching approach and curriculum that intentionally sought to explore leadership as a phenomenon, alongside other conceptual and rational notions of leadership. Hermeneutic activities were constructed that required interpretive and deliberative reflective writing (Birmingham, 2004; Diekmann & Magnussen Ironside, 1998; Ely, Vinz, Downing, & Anzul, 1997; van Manen, 1984, 2006). The intention was to explore the notion of leadership and call for higher order thinking responses about the essence of such a phenomenon. Problematising leadership as a phenomenon for inquiry appeared to draw out the nature and legitimacy of the students' experiences.

The students were asked to share personal experiences of being-in-leadership along with stories of experiences of others in leadership. What was important here was that the students described these experiences as fully as possible, given that this descriptive writing was the basis of the interpretive and reflective writing that resulted. The following excerpt is from a student's story:

I attended an all boys' school in another country that was run by a strict fundamentalist organisation. The school had a card system to monitor and enforce the discipline amongst the boys. Pink cards were for minor offences and grey cards for major ones. If you had three grey cards, exclusion from school was the dreaded rule for all of us. I was on two grey cards by the time I came to my final year of study. There was a major incident that happened at school and I was blamed for it. I didn't do it, honestly, I didn't do it. I was called to the Principal's office to explain what had happened and why I did it. I tried my best to explain to the Principal and Deputy Principal that I wasn't involved but to no avail. I swore on my grandmother's grave but no one was buying my story. I was asked to wait outside the Principal's office while they debated my future at the school. It was clear from the voices inside the principal's

office that the Deputy Principal wanted me out of the school. The Principal explained that if I was kicked out of school, no other school would take me in and that I would be on the streets with a bleak future. The principal (God bless him) decided that I would remain at school and complete the year. I thanked the Principal for his decision.

This student's experience was discussed in relation to the student's anxiety over the leaders' decision. It was also considered in relation to the lasting impact of a leader's practice. Vividly etched in his memory was the thought that sometimes "a strict application of the rules is not always the most humane decision."

The interpretive writing required the students to hermeneutically consider the meaning of leadership, being-in-leadership, and the nature of leadership. During this activity, students were unaware of our intention that they notice the essence of leadership that was beginning to emerge across their stories and reflective writing. To more specifically focus on the essence of leadership, the students were asked to review their stories and interpretations alongside the other students' contributions and respond in writing to the question, "What is the nature of the relationship between educational leadership and the human context surrounding this leadership?" One student encapsulated her thoughts stating, "effective leadership is when we combine vision with wise action cradled within a sense of humanity." Another wrote:

I am really intrigued with the idea of redundant leadership and believe it is in fact commonplace. Likewise, distributed leadership happens all the time but we don't acknowledge it. As they say, the rhetoric is way behind the reality. It just doesn't have the glamour of 'superman' and 'the caped crusader', but stereotypical heroes are more of a popular fantasy than reality.

Students began to appreciate that the phenomenon of leadership eludes simplistic and prescriptive language. One commented:

I think it is easy to find quotations about educational leadership and try to unpack what it means to be a great leader in an academic way, but I don't believe that outstanding educational leadership can be summed up in a quote or an academic sound-byte. Seeing and experiencing excellent leadership is all the more important.

The writing expectations moved from descriptive accounts to interpretive writing that was firstly specific to their own particular stories and then extended to a consideration of others' stories. In this way, the

interpretive writing was grounded from actual experiences.

As the students responded to the nature of the educational leadership and the human context, we used the students' responses to 'tease' out essential aspects of leadership as a phenomenon. One student, for example, wrote of the essence of leadership using phrases such as "leadership is circumstantial, situational, contextual, always changing. It occurs in a moment ... for an instant."

Students understood that their writing was always public to the other members of the class. The students' writing was captured in a discussion forum within an on-line learning platform. In a dialogue with another student, one person pondered the tension between visionary leadership and daily managerial imperatives:

I do so strongly believe that in many cases the "vision" - especially if it is heartfelt and all encompassing - is hard to balance with the necessary and sometimes mundane aspects of running a class or school. At some stage if the vision is bigger than the development of the one school perhaps it is time to either leave the running of the day to day aspects of the school to a second person or time to move on altogether. I often wonder if schools should have two principals. One for effective and visionary admin[istration] and one for effective and visionary professional practice.

At the end of each week, we posted an interpretive summary that sought to capture students' essential thinking about leadership from the week's posting for a particular activity. The students' stories were re-read alongside their interpretive writing, with a view to describing emergent themes that appeared to have phenomenological power (Giles, 2008; van Manen, 2006). On one occasion, this summary focused on the contextual nature of leadership with particular concern for human and relational contexts. On another occasion, the summary focused on the uncertain and dynamic backdrop to educational leadership, as this drew attention to the *techné*, *epistémè*, and *phronesis* within leadership experiences. This summary served the purpose of summarising the students' ideas and contributions while also modelling a hermeneutic and interpretive writing style.

Implications

Considering leadership as a phenomenon, along with an expectation that students engage in activities that might be considered less academic, met with initial resistance from the students. These initial learning experiences were so different from the students' prior expectations that some students voiced their concern

about the meaning and validity of such activity. As such, some students initially struggled with the expectation to take the activities seriously. As other students posted their thinking online in response to the activities, and the level of creativity and insight was able to be seen, those resisting such an endeavour were progressively more willing to venture into their unknown learning. What the resistance did show was the students' expectation of the role of the teacher and the expectation that their participation would typically involve the taking down of the teacher's (expert) ideas.

There were numerous positive effects for the students, the teaching staff, the pedagogy of the paper, and the thinking that surrounded our inquiry. One noticeable effect of these changes to the paper was the affirmation given to the students' experiences of leadership, as these were made public to other class members. The connections between students' experiences became more obvious, and the generation of themes that might construct the essence of leadership affirmed the 'contextual' nature of leadership experiences. In this way, leadership experiences were always in context, a matter that at times appears to be ignored in the theorising of leadership.

Another recurring experience was students re-living their prior experiences and interpreting fresh meanings from these experiences. As such, the significance and the influence of 'being-a-leader' and experiencing leadership came to the fore. Heidegger (1996) suggests that our past is always in front of us. It could be said that for these students, their new interpretations of past experiences influenced the lens with which they now perceive educational leadership and their 'being-as-a-leader.'

We also found that these new activities appeared to engender a sense of life in the students' academic endeavours. Students were encountering the novel, which contrasted with their initial expectations. Indeed, their own creativity was opened to others for comment. Invariably, students' contributions opened a new strand of dialogue that was specific to their experience while remaining generic in terms of the essence of leadership.

The students' stories and interpretive writing opened possibilities for thinking together about educational leadership. We would describe the dialogue that resulted as rich, integrative, and full of possibility. In this way, the students' actual experiences and interpretive comments appeared to ground the dialogue surrounding the essence of leadership. This is not surprising given the nature of some of the stories. Some students chose to share stories that were very intense and emotional in nature. Immersed in her writing, one student said, "I'm aware that this story is too long. I should have chosen a less current and emotive story but I was three quarters of the way through it before I realised and then didn't want to start with another!"

This grounded dialogue served to anchor the student's educational experiences to our intention that students engage with the essence of leadership and leadership practice. The aforementioned student went on to say,

I am without doubt that this and all other dilemmas are resolvable ... tensions are felt like a thick blanket in the air to all who walk through the door. ... 'Being a leader' involves dispositions such as kindness and fairness.

As teaching faculty, we have found a greater courage to engage students in a pedagogically open manner (van Manen, 1990). Like the students, we were also influenced by the learning process and the experiences and writing that was shared. We intend to broaden the application of these activities within this particular paper and across the Masters of educational leadership programme.

We find ourselves pondering Gadamer's position that, as human beings, our way of being is to 'live questions' rather than answer them (Gadamer, 1994). In educational contexts where the practice of leadership is always found to be unique and relational, it seems to us that this paper provoked a consideration of the leader's need to remain attuned to what is essential in any moment and context. In this way, the essence of leadership involves a way of being towards others and the experiences we find ourselves in. Such comportment allows leaders to act while wondering, make decisions while holding the mystery of the experiences they find themselves in, and open spaces for meditative thinking that best serves others.

Where most academic programmes intentionally aspire towards intellectual and technicist outcomes (Bingham & Sidorkin, 2004), we have noticed the priority the students have given to affirming the contribution and thinking of others in the class. The dialogue within and between students and teachers is critically important as the vehicle for thinking. What should not be forgotten are the many silences that occurred for staff and students as they pondered another person's contributions and experiences. It would seem that the pedagogical arrangement affords the space for a deepening human response to the dialogue that presents itself. In this way, the students' attunement towards educational leadership, we would argue, is in very good hands—their own.

Conclusion

At a time when the ideological backdrop to education invades academia at all levels, students enrolled in educational leadership programmes need to be provoked to critique the current context of education as well as their own experiences of leadership.

Grounding a compulsory educational leadership paper within a Masters of educational leadership programme towards the essence of the phenomenon we call 'leadership' has resulted in refreshing and insightful educational outcomes for all the participants. Through sharing experiences, conceptions and interpretive writing, students in this course deepened their appreciation of the idiosyncratic and contextual nature of the practice of leadership in education.

The power of the educational process resides in the openness of the pedagogical stance of the teaching staff and the elusiveness of the taken-for-granted nature of leadership. It is our conviction that educative processes that call for students' experiences of leadership sustains the centrality of a concern for the humanity of leadership, a matter of urgency in our present circumstance.

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Co-Creating Metaphor in the Classroom for Deeper Learning: Graduate Student Reflections

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Metaphors are pervasive and accessible thinking and learning machines that have the ability to disrupt and transform our patterns of thought. While much has been written about metaphor as a pedagogical tool, the potential learning opportunity that arises when students co-create metaphor within the classroom as a way to make sense and meaning of the curriculum and co-discover knowledge is not discussed. Through the example of six graduate students co-creating a metaphor of capacity-development-as-fire, this critical reflective paper describes an emergent learner-driven process involved in utilizing metaphor as a learning activity to promote deeper and long-lasting student learning and knowledge acquisition.

The construction of metaphors—two dissimilar and often disparate terms or concepts placed together to create newness and understanding—is an incredibly powerful thinking machine and lies at the heart of what it means to be human (Lakoff & Johnson, 1980). Through the paradox of being strange, yet familiar, metaphors can perform an operation on our cognitive processes, and, as such, they can disrupt and transform our ways of thinking. They can introduce theory and terminology and elicit understanding where none previously existed and, in so doing, produce something that promotes a deeper connection with the ideas within, and extrapolated from, the metaphor. According to Lakoff and Johnson (1980, cf. 1999), because metaphors are so deeply rooted in our experiences and our thinking, they enable us to make sense and meaning of our worlds. Going further, metaphor allows us to continually make and remake reality with our minds (Cook-Sather, 2003, p. 949), for metaphor “is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature” (Lakoff & Johnson, 1980, p. 3). As Lakoff and Turner (1989) explained:

Metaphor is a tool so ordinary that we use it unconsciously and automatically, with so little effort that we hardly notice it. It is omnipresent: metaphor suffuses our thoughts, no matter what we are thinking about. It is accessible to everyone: as children, we automatically, as a matter of course, acquire a mastery of everyday metaphor. It is conventional: metaphor is an integral part of our ordinary everyday thought and language. And it is irreplaceable: metaphor allows us to understand our selves and our world in ways that no other modes of thought can.

This irreplaceable and foundational quality of metaphors, combined with their ability to take what is familiar and transfer it to what is unfamiliar in a way that jars thinking (Thomas Couser, 1990), is what gives metaphor its potential for transforming frames of mind and changing thought: “in the space of imagination a metaphor opens up—a liminal space, an ‘in-between’ place which bridges the indicative (what is) and the subjunctive (what can or will be)—the mind moves itself from one ‘place’ of understanding to another” (Cook-Sather, 2003, p. 949. Internal quotation from Turner, 1980, p. 159). In this sense, metaphors can be a particularly useful strategy to liberate conventional ways of thinking and/or generate new ideas (Schön, 1979; Kemp, 1999; Blewitt, 2005), for they have the capacity to educate beyond words alone (Williams, 1986; Garner, 2005). Indeed, when “properly used, metaphors...can provide a type of shorthand to help define the intangible or abstract” (Garner, 2005, n.p.), thus facilitating the learning process.

Given these properties of metaphor, and with the understanding that human thinking is metaphorical at its core (Bowers, 1993), the use of metaphor in teaching and learning environments can be a powerful pedagogical approach. Indeed, framed within the understanding that teaching and learning are “not only about transmitting knowledge, but *transforming* and *extending* it as well” (Boyer, 1990, p. 24, italics original; c.f. Mezirow, 1991), metaphors—and curriculums which support and encourage their use—provide rich and deep learning opportunities for students. For example, studies have discovered that in the classroom, metaphor can enhance student learning through the increased retention of material by increasing personal resonance with curriculum and by assisting with the understanding of complex ideas and topics (e.g. Thomas Couser, 1990; Blewitt, 2005; Garner, 2005; Greenwood & Bonner, 2008; Serig, 2008). Given these benefits, metaphor has enjoyed a

long history as a teaching technique in numerous disciplines in institutions of higher education (Thomas Couser, 1990; Blewitt, 2005; Garner, 2005; Greenwood & Bonner, 2008; Serig, 2008). As Garner (2005, n.p.) argued, “in teaching, using...metaphor allows the instructor to relate a potentially unfamiliar idea with that which is familiar. For many instructors, the objective for doing so is to transform a foreign concept to one that may be more recognizable to the student.” Going further, since “metaphorical language and visual imagery offers an openness to heuristic stratagems and is a possible vehicle for informal contextualization, exploratory learning, making meaning and everyday social interaction. ...‘metaphor is a way of understanding hidden connections, of reunifying the world which scientific understanding has fragmented’” (Blewitt, 2005, p. 80. Internal quotation from Bate, 2000, p. 247).

Clearly, the focus in the above literature is on utilizing metaphor as a teaching strategy, in teaching circumstances. That is, metaphor is utilized as an instructor-driven pedagogical tool to teach students. The potential learning opportunity that arises when *students* have the chance to *co-create* metaphor as a *learning* activity, however, is not discussed; that is, the process of learning that occurs when students co-create the metaphors themselves to make sense and meaning of their learning and the curriculum and to co-discover new knowledge in a collective environment has not been communicated in the literature. Indeed, it is in these moments of being open to ‘heuristic stratagems’ and ‘informal contextualizations’ which stimulate further interest and investigation, that utilizing the co-creation of metaphor to understand the curriculum becomes an incredibly rich educational strategy that encourages, fosters, and facilitates a deeper and more meaningful learning environment for students.

As such, this paper outlines a process where a classroom environment was mobilized to create an opportunity for *students* to co-construct a metaphor through engaged dialogue and co-writing, emergent from the course material. Through this process of examining, analyzing, reflecting, and re-conceptualizing the curriculum, we, as students, were provided with the space to engage with the course material, linking seemingly disparate ideas across disciplines. This process allowed us not only to move deeper into the thoughts and ideas (and thus the learning) involved in the course, but also to construct something that was personalized, meaningful, and representative of each of our sense- and meaning-making frameworks. In so doing, we moved from the instructor-driven use of a pre-defined metaphor as a teaching tool to a student-driven emergent learning process of creating metaphor from our course material to further and deepen our own knowledge. Indeed, as

metaphor creators, we went beyond the learning enhancements and benefits listed in the literature and began to develop long-lasting learning skills—skills which we have continued to utilize in other educational environments. Thus, the following reflective work illustrates the power of metaphor as a learning strategy and promotes its use as a pedagogical tool, not on its teaching merits (which we do not deny), but on its ability as a curriculum activity to promote student learning. As such, this article argues for the importance of creating space within classroom environments to provide time and opportunity for metaphors to be co-created by students to expand and enhance learning.

Methods: When Learners Create the Metaphor

The context for this learning experiment was a graduate course entitled *Foundations of Capacity Development* that ran in Fall 2006 at the University of Guelph, a comprehensive institution of higher education based in Guelph, Ontario, Canada. Our cohort was comprised of six graduate students (five female and one male) from two different programs—Capacity Development and Extension and Rural Planning and Development—and varying academic, personal, and ethnic backgrounds. Classes ran once per week for three hours and were structured as interactive seminars premised upon dialogue and debate. Curriculum was disseminated through a combination of books, journal articles, instructor explanation, and student presentations and covered the interdisciplinary field of capacity development. Both theoretical and practitioner-based concepts created the foundations of the material.

In the tenth week of a twelve-week semester, the instructor asked that as a group we reflect upon the curriculum and (attempt to) tie the information together in a meaningful and coherent way. The entire three-hour class was allocated to this endeavor and, after providing us with chart paper and colored markers, the instructor left the room to provide us with the privacy and the space to “create and construct, to wonder and to venture” (Fromm, 1964, p. 54) through this group process.

As we read through the literature on capacity development, we noted its lack of clarity, coherence, and, on occasion, explicit contradictions. We strove to take the various readings and bring their salient features together in a conceptual framework and understand the subsequent implications for learning. After several hours of brainstorming, debate, and dialogue, and after several unsuccessful attempts to represent our ideas and learning in boxed diagrams and flow charts, we felt frustrated and limited. How was it that we could fit the emergent act of learning and of building individual and collective capacity into static, bounded flow-charts and

diagrams? The answer: we could not. We realized that we needed a concept that was more metaphorical, something without distinct boundaries, something fluid, transient, and transcendent.

Throughout the discussion, one of our group members was doodling on a note page and started drawing a picture of a fire to try to explain her thoughts on capacity development. When this idea first occurred, there was a definite shift in the room. This metaphor, and this vision, spoke to each of us on many different levels. Immediately we began to take the main concepts discussed throughout the course and apply them to the components of the fire metaphor, from the ashes to the woodpile to the flames. Together we constructed a visual metaphor—for indeed we drew a picture—that not only brought the course material together and allowed us to review the material in a collaborative and rigorous way but also made sense and meaning for each individual in the room. This sense and meaning grounded in a metaphor held particular resonance for each person in the creation process but also was recognizable enough for other people unfamiliar with the literature to understand the material through a capacity-development-as-fire model.

The Results: Capacity-Development-as-Fire Metaphor

The metaphor of fire, and its four major components, provided a framework for understanding capacity development in theory and practice and united our thoughts and experiences in a way that was liberating and long-lasting rather than limiting or confining.

History and Ontogeny: *The Ash Pile*

Our journey begins at the base of every fire—the ash pile. In this metaphor, the ash is conceptualized as the history and the ontogeny of all that has come before and all that once was. History is shared—both between and among individuals and between and among collectives—and, as such, the ash represents histories, ancestries, and actions. In this light, the fire—whether it represents an individual or a collective—is built upon the ash of all past events, and thus represents a continuous connection between history and the present moment.

According to Maturana and Varela (1987), ontogeny is the history of structural changes that a particular living being has experienced. Within our metaphor, the ontogeny of the fire is directly tied to the history of what came before and to the structure of the particular pile of ash that has developed over time. Indeed, the ash is the foundation of the fire itself, and, as long as the fire is burning, the ash is continually

being added to and re-shaped. Within this understanding, the pile of ash—history and ontogeny—dictates the potential that an individual or collective may have.

Components of the Dialogical Process: *The Firewood*

In our conceptual understanding, the entire wood pile represents dialogue. Before we can begin to understand the dialogical process, we must examine the individual components (the logs) that comprise the process (the woodpile). We have defined five major components of the dialogical process, each representing an equal, but different, log in the pile: suspension, listening, reflection, languaging, and storytelling.

Suspension. Suspension is an important aspect of the dialogical process, and for many of us, it can be the most challenging part. It is essentially the suspension of our judgment of both self and other and requires being open to new situations and new possibilities. As Bohm et al. (1991) state:

Suspension involves attention, listening, and looking and is essential to exploration. Speaking is necessary, of course, for without it there would be little in the Dialogue to explore. But the actual process of exploration takes place during listening—not only to others but to oneself. Suspension involves exposing your reactions, impulses, feelings and opinions in such a way that they can be seen and felt within your own psyche and also be reflected back by others in the group. (pp. 7-8)

Suspension is the stage during which individuals are willing to consider the group's ideas, thoughts, opinions, and beliefs, and for this reason it can be defined as a living component that instantly works to support the other parts of dialogue. In this process, opinions and/or ideas are not put aside (it is impossible); rather, the participants create a space between their judgments and their reactions, thus opening a door for listening and for reflection.

During suspension, we all have an essential contribution to make, and each contribution is of utmost importance to the development of an integrated and holistic understanding of our experiences. We therefore feel free to express ourselves, thus creating an environment that enables a greater degree of honesty and openness. As we learn and develop the capacity to suspend, we become more supportive, less reactive, and more aware of our assumptions. As a result, our perceptions can greatly expand, broadening our understanding of both ourselves and others.

To suspend thought, impulse, and judgment requires concerted attention to the overall process of the

dialogical encounter—both individually and collectively. This may first appear to be arduous work, but if sustained over time, we develop our capacity for such attention. When suspension occurs, a deeper communicative consciousness emerges—a stage that Bohm et al. (1991) call ‘participatory consciousness.’ Without the suspension of our judgments, biases, and values, and without the willingness to bridge differences and listen to others, we can never hope to achieve true dialogue.

Listening. Once unlocked by the process of suspension, the door to dialogue is opened through listening. Dialogue is neither discussion nor debate (Bohm et al., 1991); it runs far deeper than the simple defense of our views and opinions. In order to engage in true dialogue, we must first listen—to our own voice and to the voices of others—for listening is at least as important as speaking. In so doing, we begin to comprehend the process by which we make meaning and by which others make meaning. Even as we speak, we must be conscious to listen to ourselves and to consider and perhaps integrate the thoughts of others who have spoken before us. In this way, we can move beyond mere debate and begin to understand those with whom we are interacting.

Reflection. Before dialogue can be initiated, there must exist a capacity for reflection (Freire, 2002). The dialogical process requires not only a suspension of personal beliefs in order for an integrated and open thought process but also a reflection on our thoughts, actions, and beliefs in relation to the others engaging in the dialogue. Reflection must be viewed as an active rather than a passive process, during which we are free to question our basic assumptions and those of others. Reflection, when coupled with suspension, can lead to a confirmation, a modification, and/or a transformation of our values and beliefs.

Languaging. A human social system exists as the co-ontogeny of all its individuals, linked through language. Our language depends both on our individual ontogeny and on our history of social interaction—the history of co-existence (Maturana & Varela, 1987). Languaging shapes interactions and frames individual stories; it defines the ways in which we see the world and how we communicate, but it also limits and confines us. We are all speakers and listeners, interacting through language with other speakers and listeners. Co-created meanings arise out of these linguistic relationships, and, as such, languaging gives voice to histories and ontogenies.

Storytelling. Storytelling is an integral part of the dialogical process: “storytelling is a relational activity that encourages others to listen, to share, and to empathize” (Kohler Riessman, 2001, p. 695). As such, storytelling can engage us on a personal level, for “stories gather people around them” (Plummer, 1995, p.

174, cited in Kohler Riessman, 2001, p. 696). Through storytelling, speakers and listeners interact and interdepend, exchanging lived experiences in continual dialogue, embedded within particular cultural and historical contexts.

Storytelling does not take place in isolation; rather, the way we make sense of the world and the way we tell our stories influence the sense-making and storytelling of others. In this process of sense- and meaning-making, some stories assume dominance and are heard over others (Röling & Maarleveld, 1999). In this way, stories have the ability to shape our social relations by determining our expectations and behaviours and by providing an unquestioned (con)text to our lived realities. It is the extent to which these stories take hold of our imagination and our sense-making that make them so powerful.

Through the act of telling a story, and through the experience of listening to another’s story, we can live outside ourselves for a moment—we can suspend who and what we are—and begin to experience difference, dissonance, and conflict in a more personalized way of knowing and interacting. Stories not only fuel dialogue but can also ignite it. In so doing, storytelling leads to a more personal connection among all individuals involved in the dialogical exchange. We tell stories to open minds and to provoke action. Stories have the ability to transform us by bridging differences and by bringing us into contact with not yet encountered ideas, experiences, thoughts, feelings, and ways of being. Through this process, the act of telling a story and the act of listening to another’s story leads to the writing and re-writing—storying and re-storying—of new narratives and new meaning constructions.

Dialogue: *The Wood Pile*

We cannot conceive of capacity development without dialogue; as such, we have placed dialogue at the centre of our fire metaphor. Dialogue is a process of self- and other- discovery, which unites suspension, listening, reflection, languaging, and storytelling. In this light, “dialogue is the encounter... [between and among individuals]...mediated by the word, in order to name the world” (Freire, 2002, p. 88). Dialogue is both an existential necessity and an act of creation (Freire, 2002).

The dialogical process allows our fundamental assumptions to be revealed, discovered, and challenged and for new insights and perspectives to be built—both individually and collectively. It explores social identity, inter-personal and inter-group relations, and difference—in essence, dialogue is equivalent to mutual meaning construction (DeTurk, 2006, p. 35). Hence, “dialogue presents itself as an indispensable component of the process of both

learning and knowing” (Freire & Macedo, 1995, p. 379), which cannot be separated from the lived realities of the individuals involved.

Dialogue is not about solving problems but about opening a space for us to encounter difference, tension, conflict, and dissonance. In so doing, dialogue provides participants the opportunity to learn and grow and to experience ‘disorienting dilemmas’ (Mezirow, 1991) or challenges to our deeply-held beliefs, values, and assumptions. Dialogue provides the opportunity for reflection and re-evaluation of these beliefs, values, and assumptions, and therefore can facilitate the construction and re-construction of knowledge. As such, the moment of dialogue can be understood as a moment of transformation (Freire, 2002).

Our vision of dialogue is not defined by goals but rather emphasizes a process that is spontaneous, regenerative, and unbounded by time. Moreover, our dialogical process is fundamentally grounded in love, trust, respect, and tolerance. Therefore,

Dialogue cannot exist ... in the absence of a profound love for the world and for people. To name the world, which is an act of creation and re-creation, is not possible if it is not infused with love. Love is at the same time the foundation of dialogue, and dialogue itself ... If I do not love the world—if I do not love life—if I do not love people—I cannot enter into dialogue. (Freire, 2002, pp. 89-90)

What then is the relationship of dialogue to capacity development and learning? Without the possibility of encountering difference and conflict, we can never hope to change and transform. Transformation, change, and growth do not arise from the places where we are most comfortable; rather, we transform when we encounter disorienting dilemmas (Mezirow, 1991), adversity, dissonance, and difficulty. This experience of personal transformation can enhance our capacities for social action (DeTurk, 2006). The more willing an individual is to engage in dialogue, “the more fully he or she enters into reality so that, knowing it better, he or she can better transform it” (Freire, 2002, p. 39). For this reason, “dialogue is not just the encounter of ... subjects who look for the meaning of things—knowledge—but an encounter which takes place in praxis—in action and reflection—in political engagement, in the pledge for social transformation” (Gadotti, 1996, xi). Thus, in our conceptual metaphor, dialogue and the dialogical process—comprised of suspension, listening, reflection, languaging, and storytelling—is the fuel of our fire of life and is the foundation from which the flames grow, develop, and change. Without the fuel,

the fire cannot burn, just as without dialogue, human life cannot thrive and evolve.

Interactivity: *Flames*

It is through dialogue that we involve ourselves in a multiplicity of interactions, from encountering differences to becoming aware of shared experiences to creating new stories and histories to reflecting on who and what we are. These interactions can be chaotic, but through dialogue, we can begin to deconstruct the chaos and to situate ourselves within the process of meaning-making. It is through these interactions that we become aware of, and learn to perceive, not only our differences but also the fundamental “pattern which connects” (Bateson, 1972). We therefore have chosen to represent the flames of our fire as the process of interactivity experienced through living.

Just as flames provide us with energy that has the potential to transform—heat and light—interactivity has the ability to open the way toward mutual understanding. In our metaphor, we conceive of interactivity as interconnectivity fueled by love, “or if we prefer a milder expression, the acceptance of the other person beside us in our daily living” (Maturana & Varela, 1987, p. 246). This is a very different understanding of love than we are conventionally used to—it is a love based on ‘I love you because you are me. In our co-existence, we create a world. Without you, I could not create, and therefore, without you, I could not exist.’ It is a love based on the accordance of space to each and every human being as equally valid, important, and absolutely imperative to the existence of our self. It is a love that understands that we are all inextricably interlinked, tied together in a web that is at once fragile and fleeting, yet permanent and infinite. It is a love that allows us to expand our cognitive domain. Without love, and without this acceptance of other living beings existing beside us, there can be no social processes and thus no capacity development (Maturana & Varela, 1987). Thus, love is the energy that creates the conditions that make transformation possible.

Capacity-Development-as-Fire Metaphor Summary

Throughout this metaphor, we have addressed the different components of fire. This metaphor takes a holistic approach, acknowledging that nothing exists in isolation. Indeed, our individual and collective strength is rooted within the interconnectivity between and among our fires and between and among the components of this metaphor: history and ontogeny; suspension, listening, reflection, languaging, storytelling, and dialogue; and interactivity.

The ideas and theories explicated in our metaphor can ignite action premised on the dialogical process—action which requires us to live differently in order to

change our worlds (Maturana & Varela, 1987). Through these dialogical encounters, we can find new ways toward our goals and aspirations, and new ways to becoming in the world. This understanding compels us as learners to (re)orient ourselves and our practices and to place the dialogical process and the co-creation of metaphor at the centre of our pedagogies and our educational environments.

Discussion: Learning With and From Metaphor

Throughout this work, we are interested in student learning and in the ways in which classrooms can be structured and curriculums can be used to provide students the opportunity to *co-create* and *co-construct* knowledge through metaphor. Following a transformational and constructivist paradigm (Mezirow, 1991), this work argues that through the active co-creation of metaphor, individuals are able to acquire, accommodate, and assimilate new learning and new understanding, while simultaneously challenging previously held beliefs, meaning schemes, and meaning structures (Mezirow, 1991). Indeed, through this process, the co-creation of metaphor acts as the mechanism by and through which learners can integrate knowledge from the curriculum while simultaneously providing a means to incorporate this knowledge into a cohesive and synthesized heuristic format. In our learning experience, this format was not only easily understood by our group but, due to its metaphorical and recognizable nature, continues to be accessible and transferable to other learners and learning environments.

It is important to note that, following Cook-Sather (2003, p. 963), “the method [and pedagogical approach] for which [we] advocate in this article [are] more important than the actual metaphor used as a vehicle or medium for engaging in that method...It is [our] hope that educators will not stop with one metaphor or another, but rather keep moving as new metaphors open up new spaces of imagination that may well reanimate old metaphors.” Indeed, it is also our hope that educators will resonate with the experiences in this paper and will consider not only utilizing metaphor as a pedagogical tool but also providing and creating the space within the classroom and the curriculum to allow learners themselves to co-create and re-create their own metaphors.

In order for this emergent co-creation of metaphor to occur, there are particular requirements for both instructors and students. Instructors must be ready to not only provide intellectual space and physical support (both during and after class) for this type of emergent educational process but also let go of control of the classroom and trust in the creative and intellectual processes of the students. In this sense, the instructor

becomes a facilitator of a co-process emergent from the students and supplies the environment and the permission for this to occur within a formal educational setting. It also requires that the instructor have respect for and openness to alternative forms of pedagogy and learning activities—ones that do not subscribe to learning based on ‘right’ or ‘wrong’ or are structured as linear marches towards one final answer. Providing this space for students to co-create metaphor could include various methods. In our case, through collaborative discussion and agreement with all students in the class, the instructor modified the course syllabus to provide extra class time to develop the metaphor. In addition, he also created a new assignment related to the unexpected activity (and dropped a previously planned one) and changed the course marking scheme. These changes and alterations gave us the space to creatively co-explore capacity development through the metaphor of fire and to continue to deeply engage in the curriculum materials while simultaneously creating new and transferable knowledge constructs.

Moreover, the learners must be committed to the learning process, but, going further, they must also be committed to learning with and from each other in a creative process. Learners also need to resonate with the importance of metaphor and be willing to take control of and responsibility for the learning environment, to shape it in ways that expand and enhance individual and collective intellectual and personal capacities. Finally, the learners must also be committed to dialogue and, with the aim of expanding and enhancing student learning, be ready (as much as possible) to move beyond comfort zones and previous assumptions and conceptualizations with the goal of furthering the integration and transformation of knowledge into personal meaning schemes, structures, and perspectives (Mezirow, 1991).

What is important in this process is not that we, as students, learned with and from metaphors (although that certainly did occur) but that we learned *during* metaphor, during the process of co-creation of a new metaphor to link seemingly disparate concepts, ideas, content, and curriculum. Indeed, through this collective process, we feel that we not only learned more and on a deeper and longer-lasting level than we would have on our own but also created something that meshed the voices, understandings, and meaning-making structures of all six participants. Going further, this process also caused a transformation in our class dynamics, our sense of intellectual community, and our individual learning—a transformation that involved “a deep structural shift in [our] basic premises of thought, feelings, and actions” (O’Sullivan et al., 2002, p. xvii). To this day, the metaphor has stayed with the group, and many of us have used capacity-development-as-fire

in other educational environments and continue to use metaphor to mobilize learning in teaching and learning settings.

Conclusion: Metaphors as Persuasive and Powerful Thinking Machines

As discussed in the introduction of this paper, metaphors are fantastic thinking machines, for they do what other thoughts cannot. By the putting together of two contradictory positions, or two things that do not 'normally' go together, metaphors produce uncanny tensions of absolute strangeness and intimate familiarity, incongruity, and resonance. Metaphors offer a particular plasticity in language and malleability in speech and word as they imagine new concepts in the world. Indeed, the permutations in possible language couplings are so vast that we can imagine the possibility of continually creating anew concepts and thoughts, which in their strangeness (yet familiarity) bind, hold, and captivate us, and in so doing, transform our learning (K. Houle, personal communication, September 18, 2008).

When these possibilities of creating anew are encountered in the classroom and become objects of student co-learning and co-creation, the possibilities for learning opportunities also become vast. In this light, metaphor, and the co-creation of metaphor, can become a pedagogical technique not only to teach students but also (and perhaps more importantly) to provide learners the opportunity to co-create their own metaphors (based on course material) and to learn from the metaphoric process. Thus, metaphor becomes an invaluable, deep, long-lasting, and potentially transformative learning process.

Indeed, throughout this group process, and with the understanding that metaphor lies at the heart of our thought, knowledge, and action (Lakoff & Johnson, 1980), we were able to take numerous journal articles, books, and lecture topics and come together as co-learners to create meaning of and sense from the curriculum through a metaphor. This process not only united the course information but also spoke to each one of our group members on a variety of levels. Indeed, the metaphor of capacity-development-as-fire has continued to inform and inspire the ways in which our group approaches and/or explicates capacity development in our related fields. Going further, this learner-driven process has continued to inform our learning environments—be they formal or informal—and our learning processes and strategies.

After moving through and reflecting upon the process, we believe that we each experienced an increased retention of materials and curriculum and were much more personally engaged with the material and the course content than we had previously

experienced (c.f. Garner, 2005). As a cohort and a community, we were able to take the complex ideas and topics of the course and unite them together, through an emergent and a co-created metaphor, in a way that was both powerful and transformative, personally and academically. Just as fires—individual or communal—warm us and gather us around them, so do metaphors and their co-creative construction draw people together in an emergent process of self- and other- discovery—a process built on learning, dialogue, respect, and co-creation.

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Balancing Theory and Practical Work in a Humanoid Robotics Course

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In this paper, we summarize our experiences from teaching a course in humanoid robotics at Chalmers University of Technology in Göteborg, Sweden. We describe the robotic platform used in the course and we propose the use of a custom-built robot consisting of standard electronic and mechanical components. In our experience, by using standard components, the students obtain a deeper understanding of robotics hardware than would be possible with the use of (some) commercially available robot kits such as e.g. Boe-Bot or Lego Mindstorms. Furthermore, we propose a division between time spent on teaching the theoretical background and time spent on robot assembly and programming, which, in our view, provides the optimal balance between theory and practical work. Summarizing briefly, for a seven-week course, we propose two weeks of theoretical background lectures, followed by five weeks of practical work, in which each practical session starts with a brief theory demonstration.

This paper concerns the authors' experiences from teaching a university level course in humanoid robotics in an international masters programme at Chalmers University of Technology in Göteborg, Sweden. In courses that involve both theory and practical work, as do many robotics courses, the teacher faces the problem of weighing the theoretical and practical aspects against each other. On the one hand, at least in the authors' view, it is important to give the student a solid theoretical background before they embark on practical work. This is especially important in our international master programme, where the students usually have very different background knowledge. On the other hand, since the duration of the course is limited (in our case, the duration is seven weeks), if too much emphasis is put on the theoretical side of the course, the students' practical work may have to amount simply to assembling a robot without having proper time to actually use it. In this paper, we describe how we have dealt with this problem in our humanoid robotics course. In addition, we also briefly describe the robotic platform used in the course, motivating the use of a custom-built robot rather than a commercially available, off-the-shelf robot.

The Complex Adaptive Systems Master Programme

Following the trend toward increased internationalization, Chalmers University of Technology offers about 50 international master programmes in various fields. One of those programmes is the Complex Adaptive Systems (CAS) master programme. The courses in this programme range over a wide spectrum of academic fields and cover topics such as stochastic processes in physics, chemistry and biology, dynamical systems theory, information theory, computational biology, stochastic optimization algorithms, computer modeling and simulation,

artificial neural networks, and the study of mobile robots. Consequently, graduates from the CAS programme have found employment in a wide range of areas in industry such as software development, management consulting, research and development, product development, and in the financial sector. Despite these opportunities on the employment market, many students have chosen to continue in academia towards a PhD. It is our strong belief that our students will become even more attractive on the job market if their analytical skills acquired in the programme are also augmented with studies of engineering methodology and practical problem solving techniques. Making the connection between analytical skills and practical work is one of the main purposes of the course in humanoid robotics, which will now be described briefly.

The Humanoid Robotics Course

The Humanoid Robotics (HR) course is offered as an elective course in the CAS programme. Students taking this course have often (but not always) taken the course Autonomous Agents, which is also offered as a part of the CAS programme. In the Autonomous Agents course, the students put together and use a Boe-Bot developed by Parallax Inc. Due to its simplicity and the high quality of the documentation and manuals, the Boe-Bot is a suitable starting point for robotics work. However, the Boe-Bot's limitations soon become evident. For example, its simple Basic Stamp microcontroller cannot handle tasks such as image processing. By contrast, in the HR course, the students are given the opportunity to work with a custom-built humanoid upper body robot (described below) involving several degrees of freedom as well as the use of a motor controller (which is not needed for the Boe-Bot) and a camera.

In addition to providing a useful platform for the application of analytical skills in practical work, the use of a humanoid robot is motivated by the fact that, in the coming era of autonomous robots, it is generally believed that humanoid robots will play an important role, since such robots can be more naturally adapted to environments primarily designed for people. Furthermore, sociological studies have shown that people perceive such robots as easier to interact with than wheeled robots without humanoid characteristics (Brooks, 2002).

The students of the CAS programme come from many different countries and generally have rather different background knowledge. Some students have a background in engineering physics, whereas others have studied electrical or mechanical engineering or computer science. Regardless of their detailed background, the students generally have a solid foundation in mathematical analysis, programming, and computer modeling (topics that are included in the requirements for admission to the CAS programme).

However, the students usually only have a very limited experience in applying their engineering knowledge to practical problem solving. Like several other universities, Chalmers University of Technology generally encourages teaching activities aiming at bridging the gap between scientific and practical engineering education. An example is the CDIO initiative (Andersson *et al.*, 2005). The CDIO framework is a generalized description of a complete product or system life cycle called *Conceive-Design-Implement-Operate*. In CDIO-based education, the teaching is organized around the engineering disciplines but with the CDIO activities intermixed. The four stages in the CDIO framework are: *Conceive*, a stage that includes definition of the need and technology, considering all possible constraints; *Design*, in which the focus is on generating the design, i.e. drawings and algorithms; *Implement*, in which the design is transformed into the actual product, including manufacturing and testing; and *Operate*, in which the implemented product is used for generating the intended value, including maintaining, modifying and retiring the system. An important goal with these activities is to provide industry with highly skilled engineers who are trained both in theoretical and practical engineering as well as goal-oriented project management. In the HR course, the students are given the opportunity to develop their problem solving techniques in a assignment involving the construction and programming of a humanoid (upper body) robot.

Related Work

Using mobile robots as a tool in science and engineering education has been a common approach in

recent years (Horswill, 2000). The use of robotics as a teaching tool has been reported both for the education of young children and high school pupils (Mataric, 2004), (Movellan *et al.*, 2007), (Nourbakhsh, 2005), (Sklar & Eguchi, 2004), as well as in the teaching of various subjects on the university level (Billard, 2003), (Horswill, 2000), (Kay, 2004), (Koller & Kruijff, 2004), (Verner *et al.*, 1999).

The motivation for introducing mobile robots in the educational curriculum varies from case to case. Given the great deal of attention that robotics has received in recent years (movies, public robot competitions, etc.), robotics can be very appealing as a pedagogical tool for teaching mathematics and science for school children at all ages. Thus, by introducing robotics at younger ages, the recruitment situation regarding the science and engineering programmes at the university level is likely to improve (Mataric, 2004). Furthermore, there are several studies that report cases in which robotics is used at the university level as the main motivating factor for the students to learn various topics from the fields of computer science and artificial intelligence (Horswill, 2000). For example, Koller & Kruijff (2004) have reported a study from a course in computational linguistics in which the students created simple but interesting talking robots, based on LEGO Mindstorms, in the limited time of only seven weeks. It turned out that using robots in this course was very motivating for the students. Kay (2004) reported the use of robotics lab exercises in an introductory course in robotics for undergraduates with little or no experience in robot construction. The focus of the course is software development, artificial intelligence, and algorithmic aspects, rather than low-level hardware control. Therefore, the lab exercises in this course are based mainly on LEGO Mindstorms. This curriculum resulted in significant student enthusiasm and interesting projects, which were also presented at a local student research symposium.

Another aspect of using robotics as a teaching tool is that this topic provides great possibilities for the integration of classical engineering subjects (e.g. mechanics, electronics, software development, control theory, machine vision) with topics more oriented towards psychology and cognition (e.g. human-robot interaction) within one interdisciplinary curriculum (Billard, 2003), (Verner *et al.*, 1999). The topic of robotics does not replace courses in, for example, control theory or machine vision but offers the students an excellent opportunity to use the concepts learned from these courses for a specific application (Billard, 2003).

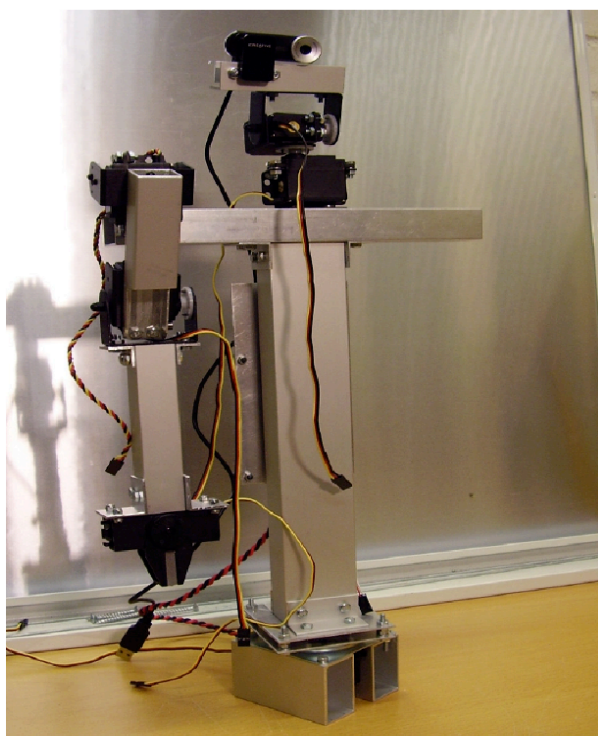
The materials used in connection with the robotics courses ranges from standard off-the-shelf robotic kits, such as e.g. LEGO Mindstorms and the Boe-Bot from Parallax Inc., to more specialized and custom-built

equipment, such as a bipedal humanoid robot (Takahashi *et al.*, 2003) or a research-grade mobile robot platform (Horswill, 2000). For the curriculum presented here, we advocate an intermediate approach: We have developed a relatively simple humanoid upper body, combined with a basic microcontroller for low-level motor control and a vision system in the form of a web camera.

Educational Robot Platform

The state-of-the-art in humanoid robotics involves complex robots such as Honda Asimo (see, for example, <http://corporate.honda.com/innovation/asimo.aspx>). Needless to say, robots of that level of complexity are beyond the financial and practical reach of a university course such as ours. Instead, in this course we have used a custom-built humanoid upper body robot named Hubert with a greatly simplified design. Hubert's size is roughly that of a small child (age 2-3 years). The total height of the robot's upper body (excluding the rotating base) is about 0.47 m.

Figure 1
Hubert, the Humanoid Upper Body Robot.



Two robot prototypes were designed for the course. Four copies of the second version of Hubert, shown in Figure 1, were then produced. Each robot contains on

the order of 400 parts (including nuts and bolts). The total time needed for producing one copy of Hubert (given detailed drawings and appropriate tools) is around 20 hours. Figure 2 shows the complete set of parts for a Hubert robot. The robots are delivered to the students in the form of a kit (i.e. disassembled).

Mechanically, the robot consists of four main body parts, namely a rotating base, a torso, an arm, and a head. The robot's skeletal structure (frame) is made of rectangular cross-section aluminium tubes. In order to make it possible for the students to carry out the assembly of the robots, complicated operations like welding should be avoided. Therefore, the aluminum beams are joined using standard machine screws and L-shaped aluminum brackets. In order to keep the costs down, the robot is only equipped with one arm, consisting of three main parts: (1) an upper arm segment, (2) a lower arm segment, and (3) a gripper. On top of the robot is mounted a web camera, providing the robot with vision. Altogether, this configuration results in a robot having one arm, a head with vision, and six degrees of freedom (DOFs) in total.

Hubert's main onboard microcontroller consists of a Board of Education (BoE) from Parallax Inc., equipped with the Basic Stamp 2 (BS2) microprocessor from the same manufacturer. Henceforth, the complete main microcontroller, consisting of the BoE and the BS2, will be referred to as the BoEMC. The BoEMC is connected to another onboard processing unit, the Parallax Servo Controller (PSC), which is used as the servo interface. The onboard microcontrollers (the BoEMC and PSC) are used for low-level control tasks such as servo control. The main robot application, implementing high-level control algorithms, runs on a standard desktop PC placed next to the robot. Thus, in the current configuration of Hubert, the sole task of the low-level program is to transfer signals sent by the high-level program (using RS232 serial communication) to the servo controller (PSC), which then sends the actual control signals to the servos. The high-level program is responsible for image processing and decision-making, as well as generating the signals sent to the BoEMC.

Course Curriculum

The course includes basic theoretical studies of humanoid robotics as well as experimental work with the Hubert robot. The use of the robot is centered on human-robot interaction (HRI) and image processing. The course runs over one quarter (seven weeks) and begins with two weeks of theoretical studies. In

Figure 2
The complete Set of Parts for a Hubert Robot



Upper left panel: The parts for the base. Upper right panel: The parts for the torso. Lower left panel: The parts for the arm. Lower right panel: The parts for the head.

addition to the lectures, the students are also required to solve two home assignments. The remaining five weeks of the course consist of robot construction and programming work.

Table 1.
The Course Schedule.

Session	Duration	Contents
W1S1	2 hours	Introduction and motivation.
W1S2	2 hours	Examples of humanoid robots
W1S3	2 hours	Locomotion (and other movements) in humanoid robots
W1S3	2 hours	Human-robot interaction
W2S1	2 hours	Image processing for humanoid robotics
W2S2	2 hours	Delphi programming for humanoid robotics
W2S3	2 hours	Introduction to robotics hardware (mechanics and electronics)
W3S1	4 hours	Robot construction
W4S1	4 hours	Robot construction and experiments
W5S1	4 hours	Robot experiments
W6S1	4 hours	Robot experiments and project demonstrations
W7S1	4 hours	Robot experiments and project demonstrations

W1S1 = week one, session one, etc. As can be seen, the first six sessions (two weeks) of theoretical studies are followed by five weeks of experimental work with the Hubert robot.

Lectures

The six lectures given during the first two weeks of the course cover the topics (i) introduction to humanoid robotics, (ii) kinematics of humanoid robots, (iii) human-robot interaction, (iv) image processing for humanoid robots, (v) programming humanoid robots, and (vi) introduction to robotic hardware (mechanics and electronics). The detailed schedule is presented in Table 1.

Home Assignments

In Assignment 1, the students are required to derive the equations of forward kinematics for the robot used in the course, given the detailed measures of the robot. The task in Assignment 2 is to make a case study of an existing robot with marked HRI capabilities, namely the PaPeRo robot from the NEC Corporation. The students carry out a literature study and then summarize it in a written report. In both assignments, the students are required to work independently.

Robotics Assignment

In the remaining five weeks of the course, the students are required first to assemble their robot kits and then to program the robot in order to solve a particular task. The students are divided into groups

(the 13 students taking the course during our study were divided into three groups), and each group is given a Hubert kit. The students are required to formulate their own tasks, both as a training exercise and as a means to increase their motivation for the work. The teachers review the suggested tasks before approving them. During our study, changes included limiting the complexity of the tasks, something that is needed since the students (in our experience) tend to formulate unrealistically complex tasks.

Each of the five four-hour practical work sessions are supervised by two teachers. The students are given considerable amount of freedom to work on the robotics assignments, but they are required at least to show up at each four-hour session to report on their progress. By the middle of the second practical work session (i.e. week four of the course), the groups have completed the assembly of the robot and spend the remaining time programming it. Final demonstrations are carried out in the last two weeks of the course. All students are required to attend the final demonstrations.

Course Evaluation

Towards the end of the HR course, the students were given a questionnaire regarding their experiences with the course, including the hardware construction part. The questionnaire, which was anonymous, consisted of a number of multiple-choice questions and also permitted the students to give their own comments directly on each question. (See Appendix A for the questionnaire and the distribution of the comments obtained from the students.)

Disposition and Goals

The first three questions (Q.1-Q.3) concerned the disposition and goals of the course. Regarding the disposition, i.e. the division between theory and practical work, all students were positive, but only three had a very favorable view. The teaching goals, which were communicated on the course web page and during the first lecture, appear to have been clear.

Lecture Quality and Level of Difficulty

The topics of the six lectures given in the beginning of the course are presented above. The quality of the lectures (Q.5) was generally perceived as high or very high, with only one student giving a low grade. However, it appears that the level of difficulty (Q.4) could have been raised somewhat. This is an important lesson for the next HR course (2009). However, as described in the beginning of the paper, the students' educational backgrounds vary quite significantly, and one should therefore be careful not to raise the level of difficulty too much.

Home Assignments

As described in above, the students were given two home assignments, one regarding humanoid robot kinematics and one involving a case study of a personal robot (PaPeRo). The level of difficulty of those assignments appears to have been about right, even though some students found them to be rather easy. In the most recent HR course, several students were from a different master programme in which they had taken a course on robotic manipulators, thus making the first theory assignment a simple task for them. Overall, the home assignments appeared to raise the students' interest in the topic of humanoid robotics.

Robot Construction and Use

The level of difficulty of the robotics assignment seems also to have been appropriate, and the assignment clearly increased the interest for the topic among the students (Q.8-Q.9). Most students seem to be positive about the format of the project groups, although some claimed that not all of the students contributed to the work as much as the others (Q.1, Q.10, Q.12). Furthermore, almost half of the students thought the time allocated for the robotics project was insufficient (Q.11).

Teacher Support

All students were satisfied with the support provided by the teachers during the project part of the course, and a majority of the students now also feel more confident working with projects involving construction and programming of hardware (Q.13-Q.14).

Overall Rating

All students participating in the course would recommend the course to their interested friends (Q.15), implying that the course was mostly successful.

Suggestions from Students

The students were asked to suggest changes and additions for the course and provide general comments (Q.16-Q.17). In general, the students would like to go deeper into the technical details of various subjects such as image processing, hardware, and motion control. They also would like to see an upgraded version of the humanoid robot used in the course with a faster microcontroller and two arms instead of one arm.

Discussion

Effects on the Recruitment of Students

In order to succeed with a career in an interdisciplinary applied research field such as robotics, it is certainly necessary for the students to acquire some practical engineering skills at some point during their studies. The research carried out in our group is focused on autonomous robots, and it involves both construction and application (e.g. programming) of such robots. The recruitment base for our new master students and PhD candidates mainly consists of the students from the CAS programme. Therefore it is essential for us to seek to bridge the gap between theoretical knowledge and practical engineering demands at an early stage in the students' development.

From our point of view as robotics researchers, it is preferable that the students become acquainted with the tools and methods used in our research *before* they actually start with their master's thesis. Otherwise, too much time will be spent on such activities in the beginning of the master thesis period, significantly limiting the time being spent on the given thesis tasks.

Our aim for the masters students is that they should be able to give a real contribution to our research, thus giving us the opportunity to observe (or at least estimate) how well they would fare as PhD candidates should they wish to continue their studies. Following the completion of the HR course (in the Autumn of 2008), we have recently recruited two masters' students from the 13 students that took the course. One student is involved in the construction of a head for a humanoid robot which is to be used in our research, and the other is working on the topic of simultaneous localization and mapping (SLAM) using a wheeled robot equipped with a laser range finder. In both cases, we clearly note the benefits (from our point of view) of the students having completed the HR course: Both students are currently working on a level that may result in one or several publications being written (based on their work) at the end of their masters' projects.

Furthermore, being able to offer interesting and challenging master theses that start on a rather high level (achieved by means of courses such as the HR course) also enhances the reputation of the research group, thus making it easier to attract the very best students.

The Robotics Assignment

The high-level program for Hubert running on the desktop PC can, in principle, be written in any modern high-level language. In the 2008 course, Delphi (object-oriented Pascal) was used as the main language, although some students chose to use Matlab instead.

Even though the experience with Delphi was favorable, in next year's course C# will be used instead. Given the prominence of C-like languages at Chalmers University of Technology, the students are more likely to be familiar with C-style syntax than with Pascal syntax.

Even though the robotics tasks suggested by the students had to be modified slightly, we believe that letting the students formulate their own tasks greatly increases their motivation for the work. Some of the tasks suggested by the students included face tracking, face recognition, simple game playing, and hand-eye coordination tasks such as grasping. Furthermore, working with realistic robot hardware instead of the more simple material used in other robotics courses (e.g. LEGO MindStorms) provides the students with a deeper understanding of robotics hardware (such as sensors, electronics, mechanics etc.). They will face the reality of robotics research and focus on the relevant problems for their learning.

Student Feedback

The answers given on the questionnaire clearly showed that the students found it both interesting and challenging to apply their theoretical knowledge, which they have acquired during many years of study, to a real problem-solving task involving hardware construction and robot programming. Comments from the students include: "It's fun to see the results and possibilities!" and "One of the few courses I've had that involve[s] building mechanical structure. I love it. Should be more courses involving that."

In addition, the questionnaire indicates that the level of difficulty of both the lectures and the home assignments could perhaps be raised somewhat. A problem in this regard is the fact that, due to the limited duration of the course and the need to have ample time for robot construction, only two weeks could be devoted to lectures. This, in turn, meant that the lectures could only skim the surface of the topics considered, perhaps rendering the presentation a bit too simple. Squeezing in additional lectures in the first two weeks is not an option for reasons involving both the budget of the course and schedule conflicts with other courses. However, another option would be to divide the four-hour sessions used for robot construction and programming (in the last five weeks of the course) into two parts: (i) A brief (30-60 minutes) theory session, in which the topics considered during the first two weeks are exemplified using the Hubert robot platform, and (ii) a slightly shortened (i.e. from four hours to around three to three and a half hours) practical session for robot construction and programming. Shortening the part involving practical work would hardly have any negative effect since the students do a significant amount of the practical work outside lecture hours. The

questions they may wish to ask, and the feedback given by the teachers, can easily be accommodated in a slightly shorter session. Furthermore, the short theory sessions would, of course, be interactive, allowing the students to pose questions and make comments.

Conclusions and Future Work

Even though the number of students (13) is perhaps too limited to make far-reaching conclusions, based on our observations we advocate that the students' evident interest in applied robotics should be promoted, something that we believe will ultimately result in better engineers. In the long run, educational activities of the kind carried out in the HR course are also likely to have a positive effect on the recruitment (at the college level or even earlier) of students to the engineering profession.

Judging from the questionnaires that the students filled in at the end of the course, the majority of students appear to have been satisfied with the disposition and contents of the course. In particular, the robot construction project seems to have been a positive experience. All students answered that the robotics project increased their interest in the topic of humanoid robotics (Q.9).

Summarizing, we believe that a good balance between theory and practical work was achieved with the curriculum used during the course. Nevertheless, some improvements will be made in the next course offering (2009). Specifically, the sessions involving robot construction and programming (i.e. the last five weeks of the course) will be divided into an initial one-hour lecture and interaction part, followed by a three-hour practical part. By adding a short theory part in each session, the connection between theory and practical work can be made clearer. Furthermore, additional specific examples of robot kinematics, image processing etc. can then be given using the Hubert robot platform.

Due to the limited size of the statistical material, the conclusions given above should be seen as preliminary, and they will be followed up during the coming HR courses.

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Appendix A

Questionnaire with the Students' Answers

In this appendix the questionnaire given to the students is presented, together with the students' answers to the questions. All students answered the questions, and the distribution of the answers is given.

Q.1 How do you rate the disposition of the course (two weeks of lectures, followed by five weeks of robot construction)?
very positive 23%; positive 77%; neutral 0%; negative 0%; very negative 0%;

Q.2 Are the teaching goals of the course clear to you?
very clear 15%; clear 77%; a little 8%; not at all 0%;

Q.3 Are the teaching goals of the robotics project clear to you?
very clear 8%; clear 92%; a little 0%; not at all 0%;

Q.4 How do you rate the level of difficulty of the lectures?
very difficult 8%; difficult 0%; neutral 38%; easy 54%; very easy 0%;

Q.5 How do you rate the quality of the lectures?
very good 23%; good 54%; neutral 15%; low 8%; very low 0%;

Q.6 How do you rate the level of difficulty of the home assignments?
very hard 0%; hard 8%; neutral 61%; easy 31%; very easy 0%;

Q.7 To what extent do the home assignments increase your interest for the topic of study?
Much 15%; little 54%; neutral 31%; negative 0%; very negative 0%;

Q.8 How do you rate the level of difficulty of the robotics assignment?
very hard 0%; hard 23%; neutral 62%; easy 15%; very easy 0%;

Q.9 To what extent does the robotics project increase your interest for the topic of study?
Much 69%; a little 31%; neutral; negative 0%; very negative 0%;

Q.10 To what extent have the robotics assignments increased your ability to solve problems in teamwork?
Much 8%; a little 38%; neutral 38%; negative 15%; very negative 0%;

Q.11 Was there enough time allocated for the robotics project in the course?
too much 0%; yes 54%; no, too little 46%;

Q.12 How do you rate the size of the project groups?
too large 31%; appropriate 61%; too small 8%;

Q.13 Do the teachers provide enough support for the students to carry out the robotics project in the course?
too much 0%; yes 100%; no, too little 0%

Q.14 Do you feel more confident now to work on projects involving hardware than you did before you started this course?
yes, much 30%; yes, a little 47%; neutral 23%; no, less confident 0%;

Q.15 Would you recommend this course to your friends?
yes, absolutely 38%; yes 62%; no 0%; no, absolutely not! 0%;

Q.16 What additions or changes (if any) would you like to see in the course?
[Please refer to the main text.]

Q.17 General comments and suggestions:
[Please refer to the main text.]

Introducing Students to Ways of Thinking and Acting Like a Researcher: A Case Study of Research-led Education in the Sciences

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The concept of research-led education is gaining increasing attention in higher education. However, the concept may be interpreted in different ways, some more feasible within an undergraduate curriculum than others. The approach described in this paper aims to introduce students to ways of thinking and acting like a researcher through engaging in research-like activities during lectures, tutorials, practical sessions, and assessment. This case study models an approach to research-led education that involves identifying key research skills, then designing learning activities that encourage the development of those skills, such as collecting small amounts of data in laboratories, using data analysis, and writing weekly practical exercises and reports; presenting findings to peers; interpreting and writing results and conclusions to accompany data drawn from the research literature; exploring the literature in a research field and finding gaps in the research; and producing a mock research grant application. We conclude that this approach to research-led education can be integrated into the general undergraduate curriculum with relative ease.

There has been increasing discussion since the 1990's of the role of research in teaching. This seems to be in response to a number of forces acting on higher education, including increasing fiscal and workload pressures that have led to decreasing (and potentially competing) time and resources for teaching and research, government policies that are encouraging a separation between teaching and research (at least in Australia and the UK), rising quality assurance expectations, increasing concern with student learning outcomes, and greater competition among universities (leading research-intensive universities to emphasise a possible competitive edge). This concern with the role of research and teaching has been evident in the number of publications on the teaching-research nexus and also on the potential benefits of research-led education. It is this last body of research that we contribute to in this paper.

One thing that complicates discussions of research-led education is that different terms are being used in the literature and in practice to refer to the same idea, e.g., research-led, research-based, research-informed.... In addition, the same terms are being used to refer to different ideas—research-led education (and equivalent terms) are being used to refer to such disparate ideas as bringing research findings into the content of one's courses versus using educational research to inform the design of one's courses. While some authors use different terms to refer to these different ideas, there is no common consensus on terms, leaving the potential for much confusion as to what research-led education (or any related term) means.

Despite the variation in terms, there is more consensus on the range of possible meanings of

research-led education. The most common distinction in potential meanings is drawn between:

Pedagogical Research: i.e., using or engaging in educational research in order to inform the design of one's teaching and one's students' learning; and

Disciplinary Research: i.e., using disciplinary research to inform the content of one's teaching and students' learning (Entwistle, 2002; Biggs, 2002; Brew, 2003; Holbrook & Devonshire, 2005).

Less commonly, further distinctions are drawn within the latter category, with disciplinary research viewed in terms of:

Research Findings: i.e., introducing students to up-to-date research content and

Research Practice: i.e., introducing students to ways of thinking and acting as a researcher (Francis, 2002; Brew, 2003; Durning & Jenkins, 2005; Holbrook and Devonshire, 2005.)

Ways of addressing research practice at the undergraduate level can include offering courses on research methodology, providing opportunities for students to conduct their own research projects (or to assist academic researchers in their projects), or the more innovative approach of introducing inquiry-based learning in undergraduate courses (Brew, 2003; Holbrook & Devonshire, 2005; Robertson & Bond, 2001; Robertson & Blackler, 2006; Trigwell, 2002). It is this last approach, introducing students to the practice of research through an inquiry-based course design, that is addressed in this paper.

This focus on research practice raises the issue of disciplinary differences in research processes. A number of authors emphasise the importance of acknowledging such differences (Durning & Jenkins, 2005; Entwistle, 2002; Holbrook & Devonshire, 2005; Robertson & Bond, 2001; Robertson & Blackler, 2006), leading to the value of having examples of research-led teaching in different disciplinary contexts. This paper contributes by presenting a case study of research-led teaching in the biosciences, highlighting the skills and thinking required of a researcher in the area and the ways in which these different skills may be emphasised in undergraduate course design. The context for this case study is a third-year undergraduate neuroscience course with an enrollment of approximately 50 students in a research-intensive university in Australia.

Although the case study is science-based, the model provided of identifying key research skills and designing lecture, tutorial, and assessment exercises to address these is relevant across disciplines.

Clarifying Key Research Skills

While the most authentic way of teaching research skills may be through guiding students in the conduct of their own mini-research projects (and this was included in the course to some extent), this is a more resource-intensive activity than most courses can afford. Consequently, the main approach to developing research skills in this course was through engaging students in research-like activities such as: collecting small amounts of data in laboratories, engaging in data analysis and writing weekly practical exercises and reports; interpreting and writing results and conclusions to accompany data drawn from the research literature; undertaking library research on an unknown topic, summarizing the findings and presenting it to peers; exploring the literature in a research field and finding gaps in the research in that field; and producing a mock research grant application.

Holbrook and Devonshire (2005), in their case study of research-led teaching in climate science, suggest that thinking like a research scientist involves the 'routine' activities of hypothesis, experimental design, experimentation, analysis, and scientific deduction. While we agree with this at a macro level, we thought it important to identify research skills in the biosciences at a more micro level. When students are inducted into research through conducting their own projects, multiple research skills are developed simultaneously. However, in order to develop students' research skills through a series of small activities, it is necessary to isolate the kind of skills required for biological research so that learning

activities and exercises can be better designed to address them.

The skills addressed in this course were:

- Observation: addressed through exercises where students were required to monitor changes in the structure or function of the central nervous system in response to experimental procedures.
- Description: addressed through inviting students to depict features or parts of the central nervous system based on histological images they were presented with.
- Analysis and interpretation of data: addressed through having students read scientific papers and explain the authors' experimental results through graphs and pictures.
- Ability to discuss and brainstorm ideas: addressed through presenting students with a scientific hypothesis and having them talk about suggestions for experimental designs to prove or disprove it.
- Library research: addressed through giving students the task of researching the literature on a neurological disease.
- Presenting findings: addressed through asking students to describe their understanding of the neurological disease they had researched to their student peers in a seminar.
- Ability to apply theoretical knowledge in practice- addressed through asking students to explain the symptoms of disease based on the anatomical and physiological knowledge developed during the course.

The course curriculum was designed to contain learning activities that would encourage the development of each of these skills. These activities are described in detail in the next section.

Course Design to Develop Research Skills

In terms of contact hours, this course was given a standard university allocation of time for lectures and practical classes -- three 1-hour lectures and one 3-hour practical per week over the 13-week course. There was no time allocated specifically for tutorials within the timetabling, so to allow time for the small-group activities described below, two practical class times were used. Thus, the unusual emphasis placed in this course on students' development of research skills was not dependent on special resources or circumstances. Nevertheless, the course coordinator decided to give up some of the lecture and practical

classes to allow time for group project work, as will be described below.

Library-based Research Project

Laboratory-based projects may be the ideal approach to developing research skills, but they are also unrealistically resource intensive and unessential to the development of many research skills. To learn some of the most important skills, for example, the skills of understanding the literature in an area of research, and presenting and planning further research, students were asked to undertake a library-based research project in small groups. While it is not unusual for courses to involve library research, what made this project innovative was its complex, multi-faceted nature and the focus on applied relevance. The project involved literature searches, a group presentation on findings, and group preparation of a grant project proposal for future research in the area.

Given the complexity of the project, students were given four weeks to complete this task. During this time, two tutorials were conducted (described further below), one to manage the logistical aspects of getting the project under way, and one to help students develop the research skills needed for the project. Further, two practical classes were set aside for students to conduct their research and engage in group discussions, as well as to prepare for their presentations. The number of lectures was also cut back during this time so that the last two weeks of the project preparation time was free from all classes -- lectures, tutorials and practical classes.

The library research project was divided into three stages: a literature search, a seminar presentation and a research grant proposal.

Literature search. In this task, students were required to research existing literature on a given topic. They were given a list of neurological and neuro-ophthalmic diseases and asked to submit a 'wish list' of their preferred three topics. The course coordinator then assigned students to small groups (of 4-5) based on their preferred topics, and they were given the task of thoroughly exploring existing literature on the topic, including present understanding of the disease pathomechanism, its symptoms, and their anatomical and physiological interpretation as well as treatment approaches to date. Students also needed to explore the present state of basic science research into the disease. This led to three core library research tasks: a critical assessment of the basic science research literature; a description of the disease mechanisms, symptoms and interpretations; and an explanation of current approaches to therapeutic interventions.

The project involved a mixture of group and individual work. The student groups had the

responsibility of dividing the three different aspects of the literature research among themselves, and they were to work on their tasks individually. Student groups met for the first time at the beginning of the first tutorial session, when the group compositions were announced. Students had 30 minutes to agree on a future meeting time, where they were to divide tasks. The coordinator gave a deadline for the groups to have their first meeting, and they were instructed to report on the task divisions to the coordinator by email. Students were encouraged to contact the coordinator or tutors with any problems or questions. The suggested time for this part of the project was four weeks. Group presentations had to be submitted to the course coordinator on disk at the end of the allocated time for preparation to ensure that all students had equal preparation time irrespective of when their presentation was scheduled.

Seminar presentation. Following the literature research, the students then summarised their findings as a group and presented them to an audience comprised of academics and their peers. Each group had an allocated time (1 hour) to present their topic and answer questions. Given the number of groups (about 10), all lecture and practical classes were given over to group presentations for two weeks.

Individual members prepared and presented their findings on the section they were responsible for, allowing for presentation marks to be allocated to individuals. Members had to work out the content of their presentation and discuss it with the rest of the group in order to avoid overlaps. (Some groups even requested a practice presentation to make sure the presentation flowed well.)

Individual students were given marks by the audience, both academics and student peers, based on the content and quality of their presentation. All students were marked by all academics present (the course coordinator and four tutors), while four randomly chosen students were also asked to mark presentations, as it is important for scientists to be able to reach an audience with different levels of knowledge. However, academics and peers were asked to mark different aspects of the presentation based on their relative expertise in the subject area.

Research grant proposal. The last task in this project involved full group work, where the members had to come up with a gap in the research into their chosen disease and submit a group project proposal for future research, following an existing granting body's application form. The submission had to include the aim and rationale of the proposed research, the methods to be used, a timeline and a budget. Students were encouraged to let their imagination run freely and to incorporate advanced methods used in the field of neuroscience. The suggested time for this part of the project was two weeks. Groups were working on this

aspect of the project during the time when presentations were ongoing.

Tutorials

Two 3-hour tutorials were timetabled during the course, one to enable the formation of groups for the library-based research project and give guidelines on the tasks ahead, and the other to help students analyze and understand scientific literature and express ideas on new scientific theories, as preparation both for their project and the final exam. This tutorial was timetabled towards the end of the course so that students could use the theoretical knowledge they had gained during the course. It was explicitly designed to develop research skills through the use of three different tasks: analysis and diagnosis of a neurological case; completion of the results and discussion sections of a scientific paper; and design of experiments to solve a scientific problem. The tutorial was conducted in two repeat sessions to permit a smaller class size. This allowed the tutors to observe student participation and encourage the more quiet students to participate in the discussions. It is easier to get students participating in a more relaxed environment, so cookies and lollipops were also provided to achieve an informal setting. Students worked in small groups to encourage peer discussion. Each group engaged in three types of activities.

Neurological case history. A neurological case history was presented to students on paper, and students were given around 30 minutes to analyse the symptoms, consult resources available (books, lecture notes), discuss these within their group, and suggest a group 'diagnosis'. After the given time, an all-class discussion was held where students presented their diagnosis and an explanation of how they had reached their conclusion. This provided a good opportunity for students and tutors alike to find and clarify misconceptions in neuro-anatomy. It also helped students to see the practical relevance of the knowledge they had gained in this field.

Completing a scientific paper. To practice the skills of observation, data analysis and interpretation, students were presented with part of a scientific paper. The introduction and methods sections were available in full; the results section was, however, limited to the graphs and images without any text. Students were given 40-50 minutes to analyse the results in small groups, draw conclusions from them, and write them on butcher's paper for the whole class to see. Finally, they needed to state whether they thought that the authors had answered the scientific question/s they had set at the beginning of their paper. After the given time, discussion was opened up to the class as a whole, and groups took turns in explaining their analysis of the graphs and figures in the article and justifying their conclusions.

Brainstorming experimental design. Peer discussions of scientific ideas are a major part of research. In the third tutorial task, the students were presented with a scientific question or theory (e.g., the question of how to go about testing colour discrimination in bees, or the theory that high tissue oxygen plays a role in the late stages of retinal degeneration). Students were then asked to brainstorm within their small group what experiments they would propose to prove or dismiss this theory. After around 40 minutes of small group discussion, ideas were discussed in the class as a whole.

Practical Classes

Weekly 3-hour practical sessions were held throughout the first half of the course. These were designed to develop students' skills in data collection, observation and understanding the relevance of theoretical knowledge in practice. (Later practical classes were replaced by tutorials, group project time and student presentations on the project, as described earlier.) The practicals took different forms in different weeks. There were three computer-based and three laboratory-based sessions. All practical classes required students to follow instructions and answer questions in their laboratory notes. This notebook formed the basis of their weekly practical reports. Students were presented with different types of exercises, for example:

Histological images. In one type of exercise, students were presented with images of histological preparations of the brain, retina or glia on the course's web page. These images reflected current research in the area, having been produced in the laboratories of some of the department's lecturers. In their practical notebooks, students were given a short explanation of the images and asked to respond to questions or perform tasks, such as describing the histology of a sample, to drawing sketches of certain cell types, or explaining the results and drawing conclusions from them.

Small experiments. In another practical, students conducted a small experiment by themselves. This activity involved the histological staining of prepared tissue samples, followed by cover slipping and microscopic examination of the sample. Students were asked to draw a sketch of the tissue, describe the microscopic picture, and identify the tissue based on the knowledge they had gained during the previous week of lectures and practicals.

Computer simulations. In another activity, students used a computer program that simulated the physiology of neurons. This required students to 'conduct' voltage- or current-clamp experiments, collect data, present them in graph format, and explain their results. To help them in preparing their results,

they were guided by specific questions in their practical book. Students were required to summarise data in tables and graphs, describe results by explaining the data in writing, and analyse findings by discussing their significance.

Lectures

In general, three one-hour lectures were held each week. The lectures aimed to provide appropriate building blocks for the neuroscience course, addressing anatomical structures, membrane properties, the process of eliciting an action potential, the roles of membrane channels, etc. in a largely preset curriculum. However, this didn't mean that the development of students' research skills needed to be neglected.

Lecture quizzes. When a new concept was introduced and explained during a lecture, a relevant image and question for the students to answer would be presented on a slide. This was designed to show students the relevance of the new concept. For example, after teaching the anatomy of the circulatory system of the brain, an angiographic picture of an aneurysm was shown to the students and the question was, "What consequences would the rupture of that aneurysm have in a patient?" The students could discuss the location of the aneurysm, the vessel involved, and the surrounding anatomical structures. From there, the implications for loss of certain functions (e.g., sensory or motor system symptoms) were discussed.

Students were allowed up to five minutes for open discussion and to suggest answers to the lecturer. Once the right answer was given, that student was asked to give an explanation to the class as a whole as to how he/she reached his/her conclusion. At this point, students were encouraged to ask questions to make sure that they understood the answer. This exercise was aimed to develop skills such as observation, description, understanding and interpreting data/findings, logical thinking, presenting ideas and applying theoretical knowledge in practice.

As an added benefit, during the open discussion, the lecturer was also able to assess the percentage of students with a good understanding of the concept. If the lecturer wasn't satisfied with the level of comprehension across the class as a whole, she would spend more time on the relevant concept, explaining it further and encouraging students to ask questions to clarify their understanding. Following the open discussion, students seemed to be more ready to be interactive and ask questions during the follow-up session.

Expert guests. Students also listened to formal lectures given by experts in the field of neuroscience. These lectures aimed to teach key concepts in the area as well as to demonstrate the present state of research in

the field, including the latest developments and the work conducted in the guest lecturer's own laboratory. While this aspect of research-led education, 'teaching what we research,' is common, it has its limitations. Although students can hear about the latest advances in the field, it provides little opportunity for them to develop their research skills, which is why the course coordinator used lecture quizzes in her own lectures.

Optional Lab Project

Given the size of the class, it was not possible to offer laboratory-based projects as an integral part of the course. Difficulties in recruiting willing academics with suitable hands-on research activities to offer students, as well as making sure that the level of student involvement in such projects was equal or at least similar in all participating laboratories, makes the integration of this type of activity in an undergraduate course difficult. Nevertheless, rather than not provide this opportunity at all, students in the course were given the option of undertaking a 'mini-project' in the laboratories of the course coordinator on a voluntary basis.

During an informal meeting, the activities of the laboratories and the type of possible projects were described. Interested students (some 5-6) were asked to approach the coordinator for an individual discussion about their goals, plans, interests, possible time commitments, and any special requests (e.g., allergies). The course coordinator had a list of short experiments on offer. Based on the discussion with interested students, an individual project and experimental plan was outlined.

Students then were asked to start a literature search and produce a review paragraph to demonstrate their understanding of the background for their individual project. A timeline for the project was also determined at an early stage. Students were coached in techniques they needed in order to conduct their project. Discussions between the student and coordinator occurred regularly, as required. Students were guided through the entire process of data collection, analysis and description of findings.

Although this activity was highly time consuming for the course coordinator, it did provide the opportunity for students interested in research to gain valuable research skills, as well as to ascertain if this is really the career or field they wish to pursue. Students had the option of submitting a report on their project, complete with background, methods, result and discussion sections. These reports were assessed and worked into their course work mark, typically by counting as a 6th practical report (see the following section on assessment).

Integrating Assessment into the Course Design

The assessment for this course was designed to support the course focus on development of research skills. It consisted of:

- Five practical reports, worth 25% of students' final grade (i.e., 5% each);
- Student presentations, worth 20% of the final grade;
- Group project proposals, worth 5%; and an
- End-of-semester exam, worth 50% of the final grade.

Practical Reports

The practical reports were designed to help students' learning by giving them tasks that would help clarify the basic research or clinical relevance of the topics or concepts addressed in lectures during the preceding week. They required students to use their theoretical knowledge in practice. The reports also aimed to develop students' research skills by presenting them with exercises where the skills of observation, analysis and presentation of findings needed to be utilized.

The type of exercises required for the reports, described in more detail in the preceding section of the paper, included the summary of data collected during the computer-based experiments or *in vivo* (e.g., measuring reflex time on each other), or a description and analysis of images presented during the practical. Students were expected to complete some of the reports during the practical session, while others were to be completed at home using additional resources. Only five of the reports had to be handed in for assessment. However, many students submitted all six reports for feedback, and in those cases, the five best marks were counted towards their course mark. Each of these reports contributed 5% towards students' final mark. So, this part of the course gave a total weighting of 25% towards students' overall course grade.

Student Presentations

It is a very important skill for a scientist to be able to communicate his/her findings and thoughts to their peers and the general public. Therefore, there was an emphasis in the course on student presentation skills. As described earlier, students had to prepare an oral presentation on their chosen library research topic. Marks were given based on the content of their presentation, such as relevance, logical flow and proper referencing, as well as their presentation skills, such as the quality of their slides and the manner of delivery. The presentations were marked by four randomly

selected peers (making sure that they were not peers from their own group) as well as by the course coordinator and tutors. An assessment sheet was prepared by the course coordinator which contained the categories the marker was asked to concentrate and comment on, and the weighting for the different aspects of marking were indicated. Different assessment sheets were prepared for academics and peers to cater to their different levels of expertise in the area. The marks were then averaged, contributing 20% towards students' overall course grade.

Project Proposals

Many young scientists find writing grant proposals very hard. However, it is a way of life in the academic environment, and it is commonly the only way to get resources for our research. In the present economic environment, where universities offer fewer and fewer continuing positions, scientists have to rely on external funding not only to conduct research but also to have salaries for themselves. Thus, learning to write good project proposals is paramount. As such, the course coordinator felt that it was important to have an activity to introduce students to this vital part of scientific life.

Since the proposal was part of students' course project, they had a good understanding of the literature of their chosen topic by the time they were preparing their proposal. They were encouraged to use their imagination freely; they could use any aspects of their theoretical knowledge gained in other courses during their undergraduate studies, e.g., many suggested experiments involving molecular or biochemical techniques. The ability to integrate their knowledge is invaluable for understanding the practical relevance of the knowledge gained during their time at the university. It also demonstrated their skills in translating theoretical knowledge into practice. The formatting of their writing and the creating of a timeline for the project required different skills, the presentation of ideas and time organisation. The preparation of a budget made students aware of the expenses involved in scientific research.

The group project proposal contributed 5% to the overall mark. The weighting placed on this task was seemingly low because this was the first year this exercise had been given, and the novelty of the exercise warranted a lower weighting. However, it proved to be a popular task amongst students, and the course coordinator was happy with the quality of project proposals produced by students. In the future it can have a more prominent place in the assessment scheme.

Final Exam

The final examination tasks were formulated to test student understanding of the subject and the research

skills they had gained during the course. They included a mixture of traditional and more innovative assessment tasks. There were three types of tasks: short answer, case history and essay.

Short answer questions. To assess the students' skills in analysing and understanding data, short answer questions were used. Students were presented with graphs or images based on real data taken from the lecturers' own research results. A short explanation was given with the data, and students were asked to answer questions related to the graph/image. For example, students were presented with a picture of part of a normal and a diseased brain. The accompanying task was to describe two major differences between the two samples and to state the relevance of the changes in the diseased sample, with the possible clinical consequences. In another question, students were presented with a series of patch clamp recordings and were asked to plot the current-voltage relationship and explain, based on the result, which ion(s) they expected to permeate the examined channel. This exercise involved the same skills as one of the tasks they had been given during the tutorial session, where they were asked to interpret the results of a scientific journal article. It showed their ability not only to analyse and understand data but also to present their findings

Neurological case. To test their anatomical knowledge and their ability to apply that knowledge in practice, students were given a neurological case and asked to explain the disease symptoms in anatomical and physiological terms. They were encouraged to use sketches to explain the anatomical structures involved in the disease and, finally, to give a 'diagnosis' as to the location and type of lesion (e.g., tumor, haemorrhage, degeneration). This exercise involved the same skills as the neurological case analysis conducted during their tutorial session.

Essay. Students were also presented with a number of topics covering the whole course material and were asked to write a traditional essay on their chosen topic. This task was chosen to be part of the examination to provide students with a more familiar type of assessment, and thereby to relax them before they were faced with the more challenging part of the exam paper.

Success of the Course Design

Conclusive evidence of the success of the course design is difficult to establish. However, one indicator comes from student evaluations of the course. Student evaluation surveys are routinely conducted for all courses in the school. Although the survey form was not tailored for the innovations in this course, ratings of the course coordinator's effectiveness as a lecturer were collected. These averaged 4.56 (out of a maximum of

5), compared to an average of 3.91 across the school as a whole, and 4.00 for the same course coordinator in the previous year.

A more objective assessment of success comes from gains in students' learning, as measured by students' ability to tackle problems during the course in their assignments and at the end of the course in the exam. Since the exam questions were designed to present problems or tasks similar to the ones in the assignments, it allowed us to see the improvement of students' ability to respond to such questions over the duration of the course.

As Nikolova Eddins and Williams (1997) stated, there is an increasing need for students to be more prepared for their future careers by bringing classroom experiences and career skills closer. Well-developed skills empower students for their future by letting them enter into the workforce (including academia) with confidence and ease. Although the students found the structure of this course extremely challenging, we noticed that the assessment results gave a good representation of the students' scientific abilities. Further, the course helped students to utilize their own thinking skills, rather than just attending the lectures and submitting assessments without necessarily thinking any further about the relevance of their studies. Many students from this course chose to continue on the path of research and enrolled into the university's neuroscience honors program.

Costs and Benefits of the Course Design

With the increased interest in research-led education, institutions are under pressure to increase laboratory space and equipment to allow students the experience of more research-like learning, and academics are under pressure to accommodate students in their labs. Given a simultaneous pressure to increase student numbers, the task of research-led education would soon become impossible if it were interpreted primarily as providing students with lab-based research experience. In this paper we illustrate a more affordable approach to research-led education, providing experience in research skills through a course-based approach.

We have found this to be a manageable approach to teaching ways of thinking and acting like a research scientist to undergraduate students. Nevertheless, there are still costs in both time and material resources to be accounted for. For the laboratory-based projects and activities, materials already available in the course coordinator's laboratories were used. A modest overproduction of slides during postgraduate and honors students' projects or other personnel's work, for instance, can be utilized to provide students with individual slides for staining. The images used in the

online histology assignments were also obtained from the course coordinator's and her colleagues' research material. Whilst the initial preparation of such online material takes weeks, it is largely a one-off exercise, so it is well worth the effort as the material can be re-used over time. In the computer simulation activities, we used a freely downloadable teaching software (Neuron), which comes with pre-designed activities that allow a relatively quick set up. Nevertheless, there is a time commitment involved in tutors and demonstrators familiarizing themselves with the program.

Other activities required the purchase of some hardware or accessories. Dissection activities needed the purchase of specimens, usually for a moderate price. Physiological experiments utilized commercially available hardware (PowerLab, AD Instruments Pty. Ltd., Australia). The basic hardware set-up is usually costly, depending on the number of units needed; however, the data acquisition system can be shared between several courses and programs within the university. In our case, the institution already owned and used the system in two other programs, and we only had to make a one-off purchase of accessories relevant to our course, which did not pose a high financial burden. It is also possible to utilize institutional workshops to create such accessories, as happened in our case a few times.

In summary, by looking at one's own research and thinking of ways to use existing materials, techniques, or the literature in teaching undergraduate students, the costs of developing a course or modules similar to the ones described in this paper may be minimized.

Benefits to the students have already been outlined. For the teacher, the change in thinking for linking research and undergraduate teaching proved to be challenging but also enjoyable. To watch the intellectual growth of students gives enormous satisfaction. To witness the evolution of a thinking, inquiring young scientist during the course of the semester is what we all try to achieve. It was evident that, with time, students became more relaxed and confident in their knowledge and, based on the exam results, many achieved a deep understanding of the practice of neuroscience.

Conclusion

The authors' home institution's Education Management Plan clearly states that its education should take strength from the research-intensiveness of the institution. The stated objectives of education, amongst others, are 'to challenge and extend students, guide them in self-directed learning and, through discovery-based education, prepare reflective, analytical and questioning graduates.' However, when it comes down to strategies for achieving these

objectives, the Management Plan offers only general guidelines on how to integrate research into the curriculum -- mainly through the increased use of high quality researchers in teaching. The development of undergraduate and postgraduate coursework programs with a significant component of genuine research is also encouraged.

Unfortunately, research-led education along these lines can only be offered to very able undergraduates and to postgraduates, since 'genuine' research is costly. If research-led education is to be available to all undergraduates, less costly approaches are needed. This paper presents an example of how discovery-based and research-led education can be introduced into the mainstream curriculum in an affordable way. By identifying the key skills researchers in a discipline need, students can be introduced to these skills and related practices from an early point in their undergraduate studies without a major increase in expenses.

The present study gives numerous examples of introducing students to research practices within a course work setting. Although this case study is based in the natural sciences, the same approach to teaching research skills could easily translate into other disciplines. For instance, the idea of library-based group research projects culminating in preparing a mock research grant proposal is applicable to any discipline. Not all disciplines have practical classes, but tutorials are common, and designing tutorials to include analysis of case studies and completion of partial research papers would again be possible in any discipline. The use of problem solving tasks or projects to develop critical thinking and analytical skills is also relevant to a wide range of disciplines. Some of these strategies require more effort from the course convener than others. However, the benefits for students, teachers, and institutions outweigh the initial time and energy required to introduce such activities.

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Performance Assessment: Lessons from Performers

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The performing arts studio is a highly complex learning setting, and assessing student outcomes relative to reliable and valid standards has presented challenges to this teaching and learning method. Building from the general international higher education literature, this article illustrates details, processes, and solutions, drawing on performance assessment and studio research literature in the field of one-to-one, or applied, music teaching. The nature of musical performance assessment will be explained as an emerging tool embedded in the pedagogical methodology research literature of the applied studio learning setting. Implications are explored and suggestions are made for other disciplines in regards to both summative and formative performance assessment strategies.

Assessment in higher education has been under scrutiny since 1990 (James & Fleming, 2004-2005, p. 51), and music assessment can be included in this area “identified by those in the measurement community as prime examples of unreliable measurement” (Guskey, 2006, p. 1). It is now recognized that assessment provides a critical link in the teaching and learning process and that in higher education, researchers are exploring assessment techniques in a variety of discipline settings. This paper will examine assessment’s role in higher education in the 21st century and its place in the wider literature. Case studies from various disciplines will be illustrated and the focus will move to performance assessment and how performance arts faculty develop and use tools to evaluate literal ‘performance.’ Analogous relationships may be seen with other disciplines that require ‘performance’ be assessed, or evaluated, and suggestions are made for developing tools to measure student performance.

Assessment in Higher Education

“Few educators receive any formal training in assigning marks to students’ work or in grading students’ performance and achievement” (Guskey, 2006, p. 2), and yet the importance of higher education teachers’ understanding of the fundamental underpinnings of the principles of assessment can be seen in some of the most recent literature (Brown, 2004-2005; Guskey, 2006; James & Fleming, 2004-2005; Orell, 2006; Stefani, 2004-05; Van den Berg, Admirall, & Pilot, 2006). Shepard (2000) puts forward a sound framework regarding the importance of assessment in learning cultures, using public school classrooms as her platform for discussion, and she makes several good points that can be applied directly to higher education. The first point states that assessment should be seated in the middle of the teaching and learning process (p. 10) instead of being postponed to the end-point of instruction. Shepard calls

this “dynamic” assessment and points out that these assessments are usually found in teaching and learning settings. Her second point poses that feedback, as part of assessment, should not only consist of reporting right or wrong answers to students but that scaffolding and expert tutoring techniques are more successful. She cites the work of Lepper, Drake, and O’Donnell-Johnson (Shepard, 2000, p. 11), who found that tutors often ignored student errors when they were not important to the solution, and they prevented students from making errors a second time by gently hinting or asking leading questions. This type of indirect feedback was shown to maintain student motivation and self confidence as it was used throughout the learning episode. Shepard’s third important point refers to transfer, where she suggests that we assess our students’ abilities to “draw on old understandings in new ways,” and she adds the notion that assessment should not merely test “familiar and well-rehearsed problems” (p. 11). Not surprisingly, this leads to her fourth point regarding the explicitness of the criteria in assessments. The clarity and specificity that music as a performance discipline has had to adopt in the criteria for assessments has been a long uphill struggle and will be expounded upon later in this article.

Shepard speaks also of transparency in good assessments (p. 11), which expresses to students the characteristics of excellent performance. Noticeably, this also assists students in assessing themselves and each other. Shepard’s fifth notion points to the promise that student self-assessment holds for “increasing students’ responsibility for their own learning and to make the relationship between teachers and students more collaborative” (p. 12). These five elements (dynamic or ongoing, feedback, transfer, criteria, and self assessment) form the basis of the positive characteristics of assessment and the remainder of this section will discuss how higher education in general is examining them and then the final section will illustrate how the performing arts utilize them.

Stefani (2004-05) posits that faculty in higher education in New Zealand need to understand the fundamental principles of assessment and maintains that assessment is an integral part of student learning. She acknowledges that higher education now requires more than just “transmission of knowledge” (p. 51) and that academic faculty now must design, develop, and deliver accessible curriculum to an ever-diversifying body of students. She stresses the importance of “teaching, learning, and assessment” (p. 53) and, like Shepard (2000), would like to see assessment embedded within the teaching and learning setting, rather than just “added on after course content has been decided upon” (Stefani, 2004-05, p. 54). Stefani also puts forward key processes and, again like Shepard (2000), setting criteria, sharing responsibility between faculty and students, ensuring transparency of assessment criteria, and providing useful feedback (Stefani, p. 63-64).

Orell (2006) takes a ‘snapshot’ approach to examining feedback as it is used in Australian higher education academic practice, labeling it “the cornerstone of all learning, formal and informal” (2006, p. 441). Like Stefani (2004-05), she notes “the provision of formative feedback as an *add-on* to teaching and learning responsibilities” (p. 442). She argues, however, that “providing students with focused, comprehensive feedback on their learning product is a significant aspect of teaching and assessing” (Orell, p. 442-443). She, along with Shepard (2000) and Stefani (2004-05), present the notion that feedback can affect students’ construction of themselves, motivate future learning, and affect how faculty see the student-teacher relationship. Her study examined how academic faculty in teacher education and nursing fields gave feedback, what it indicated to students, and what kind of congruence there was between the feedback actually given and what the faculty viewed as feedback.

Brown’s (2004-2005) findings similarly support the idea that the ways in which we assess our students can affect how they learn. Her ‘fit-for-purpose’ (2004-2005, p. 81) argument offers insight about the use of “portfolios, in-tray exercises, posters, annotated bibliographies, reflective commentaries, critical incident accounts, reviews, role-plays, and case studies” (p. 83) as alternative methods of assessment seen in the United Kingdom setting. She presents the most important tenets of assessment to be efficiency, transparency, inclusivity, and reliability, and suggests that feedback is the principal area. Brown’s position supports that of Shepard (2000), Stefani (2004-05), and Orell (2006).

Van den Berg, et al. (2006) focus on peer assessment. They report that feedback is adequate in the higher education setting in the Netherlands when it is used formatively and summatively for products as well

as performed in small groups. Their work focused largely on written feedback, which seemed to be more successful when delivered orally as part of a discussion with the reviewer. The afore mentioned researchers (Brown, 2004-2005; Guskey, 2006, April; Orell, 2006; Stefani, 2004-05; Van den Berg, et al., 2006) agree on the importance of feedback as part of the teaching and learning process. Feedback is also one of Shepard’s (2000) five important areas, and the remaining four; dynamic or ongoing assessment, transfer, criteria, and self-assessment, can also be seen in the literature that illustrates the diverse impact these strategies have on student learning in the higher education setting.

Impact on Student Learning in Higher Education

O’Donovan, Price, and Rust (2004) bring forward the importance of students’ understanding of criteria in the assessment standards within higher education in the United Kingdom. They note, “the secret nature of assessment deliberations is no longer seen as acceptable” (p. 326). This point has had wide implications within the performing arts, specifically music, and will be addressed in the next section of this paper. Calvert (2004-2005) reported that developing and using grade descriptors for all tutors in the media communications field of the University of Gloucestershire, UK, was met with mixed results. Tutors, who are faculty that provide smaller sessions for students in between large weekly lectures, found it difficult to agree on descriptors in a one-day session. They created holistic rubric for all tutors to use in grading written work, but reports from tutors revealed they simply ‘adapted’ the descriptors to their own existing grading processes. Student responses were also mixed with comments indicating they preferred more personalized comments added to the rubric as part of the feedback. This mixed response to changes in assessment practice has been seen in the music performance research literature also (Parkes, 2007; 2010).

O’Donovan, et al. (2004) also found many obstacles in making assessment criteria transparent, such as the clear articulation of criteria, the different levels of expectation within the criteria, and the many interpretations that were made with simple terminology such as “synthesis or analysis” (p. 327). Their initial concern was with having experts agree so that the students or novices could also understand the assessments. Like Shepard (2000), O’Donovan, et al. spoke about the inherent importance of transferring knowledge so that students have an awareness of explicit transfer processes. These typically include giving students “explicit learning outcomes, marking [grading] criteria, and eventual feedback” (2004, p. 331). They add that other transfer processes are also

effective, such as “dialogue, observation, practice and imitation to share tacit understandings”(p. 332). These types of transfer can be seen with much more frequency in the performing arts assessment *modus operandi* of music. Ultimately, and regardless of discipline, transfer does require feedback as part of the process.

Gibbs and Simpson (2004-2005) proposed a tiered approach to feedback with several ‘conditions’ whereby assessment can impact student learning. The ten conditions largely relate feedback to the assessment tasks themselves. Conditions 1 and 2 stipulate that the number of assessment tasks is appropriate to the amount of study time and that the tasks allow students to allocate the correct amount of effort to the aspects of the course (p. 12-14). Conditions 3 and 4 suggest that the assessment tasks engage students in productive learning activity and that feedback is given on the tasks often and in suitable detail (p. 14-17). Conditions 5, 6, 7, and 8 speak to the focus of the feedback: that it is on the work, rather than the student himself; that the focus is kept on the task in time for the student to receive further help; that the feedback is appropriate to the task; and that the feedback is appropriate in relation to what the students think they are supposed to be doing (p. 18-21). Conditions 9 and 10 require that students receive and attend to feedback and that they act on it (p. 23-24).

The work of Macdonald (2004-2005) in the United Kingdom offers an alternative method of grading physics papers and moves the grading process to the students, who evaluate their own papers by using a ‘self evaluation document’ devised by the lecturer. The author reported difficulties in convincing students that it was a fair and defensible practice, but she did find that 80% of students graded themselves appropriately. Zoller (2004-2005) also examined students’ self-assessment of homework assignments in a higher education organic chemistry course in Israel. Findings were promising, as students showed appropriate grading of themselves in line with the professor’s final scores. Peer assessment is often not warmly embraced by students, as Connor (2004-2005) points out in her study findings from the United Kingdom. She asked students in health profession courses to undertake ‘inter-professional workshops’ (p. 98), which required students to work together in groups to foster presentation, collaboration, evaluation, and personal contribution skills. Students created a portfolio and gave a presentation of the work they learned, and they also completed essays discussing key issues in inter-professional collaborations. Students reported skepticism initially about the process, fearing inequity or imbalances in the group. However, Connor reports that after the process and course were completed, students and examiners evaluated the learning process and assessments as “valuable” (p. 101). Presentations as assessments were found to be successful by Brothers

(2004-2005) in students enrolled in counseling programs in the United Kingdom. The presentation skills themselves were not assessed, only the content for its relevance and links to practical application and practice. Feedback was issued in small groups, and students were also asked to write a personal reflection to show their growth over time. Students reported that this type of experience was “the most powerful learning experience” (p. 91).

Nestal, Kneebone, and Kidd (2004-2005) explored scenario-based assessments of technical skill in undergraduate medical education in the United Kingdom. Simulated models were linked with actors so that students could develop clinical skills in a real work setting. The key elements of their scenario-based assessments were ‘preparation, performance of procedure, reflection, and feedback’ (p. 108). Semi-structured interviews, after the assessments were carried out, revealed that students found the process constructive but that peer-evaluating each other was less helpful because they perceived all of their knowledge to be at the same limited level. Robinson and Udall (2004-2005) of the Southampton Institute in the United Kingdom examined the impact of instructor-led conversations about the quality of learning outcomes as part of an assessment strategy to encourage learners to initiate conversations about their own learning in engineering. Students were asked to participate in sessions to make self-assessments of whether they were meeting course outcomes. Students recorded their progress and noted questions they had for the tutor about outcomes they had not met. Findings from this action research showed that students understood why they were being asked to complete certain assessments and gained a heightened sense of understanding about their progress.

Jenkins (2004-2005) proposed that computer-aided assessment can be a largely motivating process, particularly in feedback, as it is accessible online more frequently and comprehensively. Jenkins examined the use of Information and Communication Technology (p. 68) in the United Kingdom and found that it can be used for diagnostic, formative, and summative assessments. He reported advantages as being “repeatability, ... reliability, diversity, timeliness, ... motivating to students, and being student-centered” (p. 68). He puts forward a variety of forms for these assessments such as multiple-choice tests, case studies, online portfolios, personal reflections on weblogs, online mock exams, audits, and group discussions on weblogs. He cautions interested readers about the challenge of culture change, from the UK perspective, to embrace online learning, but stresses that “online formative assessment produced benefits in terms of flexibility and immediacy of feedback” (p. 78).

James and Fleming (2004-2005) also point out that the key features of assessment in the United Kingdom higher education system include feedback and motivation. Their study illustrates the various methods of assessment such as ‘report writing, essay writing, poster presentations, and oral presentations’ (p. 44) used within programs of study and that students don’t perform consistently better on one form of assessment than any another. It is interesting to note this study’s innovative examination of agreement in student performance through the testing of traditional assessments, which is in contrast to Jenkins’ (2004-2005). The variety with which these different disciplines approach the many areas of assessment is commendable and congruent with how the performing arts trajectory for assessment development has also occurred. It is of interest then to also examine another type of assessment, more directly relevant, such as authentic, or to use the more objective term, *performance assessments* (for a detailed history of the choice of the term performance assessments over authentic assessments, please consult Newmann, Brant & Wiggins (1998) and Terwilliger (1997)).

Performance assessment has received interest within the educational literature for several decades, and in some ways this indicates the relatedness to the arts. The arts are a performance discipline, and most assessments there within are concerned with an actual performance itself. In terms of assessment at large, this has now become a term for a type of assessment, one that is different to a standardized assessment or a cognitive test. Concerns have traditionally, within the assessment, measurement, and evaluation literature, been focused on validity and criteria and aligning measurement standards. Early work by Linn et al. (Linn, Baker, & Dunbar, 1991) set forward the notion that criteria, amongst other issues, are the most salient in complex, performance-based assessment, albeit in public school settings, but conceptually the considerations remain the same. Performance assessments must have transparent criteria, be fair, be generalizable and transferable, have cognitive complexity and content quality, and be comprehensive. These are often expected from standardized assessments and should also be apparent in performance-based assessments. Linn (1994, p. 9) went on to elaborate regarding the difficulties that face performance-based assessment, namely reliability and validity. He states that when care is taken in training raters to use well-defined rubrics, reliabilities improve (p. 10). He suggests that to accurately assess students’ achievement, more than one task may need to be assessed (p. 10). Linn’s further work with Swanson et al. (Swanson, Norman, & Linn, 1995) holds up the health profession as a detailed example of performance-based assessment model, and there are noticeable

similarities between these strategies and what is found in the music performance assessments: the tests are conducted in realistic performance situations, but that there are still discrepancies between this situation and real-life; scoring can be problematic; and a selection of assessment methods should depend on the skills to be assessed (Swanson, et al., 1995, pp. 6-8, 11). Delandshere & Petrosky (1998) examine the meaningfulness and usefulness of numerical ratings for the assessment of complex performances, and while their findings refer to the performances of teachers, similar problems present themselves in music performance assessment. Delandshere & Petrosky asked the judges in their study to assign numerical ratings and to draw inferences. This occurs in music performance assessment where numerical ratings allow evidence of reliability to be calculated, and inferential information often appears as a global grade accompanying an overarching set of comments in the music performance research literature, as noted by Bergee (2003).

Music Performance Assessments

The above research and theoretical frameworks illustrate how important assessment—in particular ongoing assessment, feedback, transparency of criteria, and self-assessment—is in the higher education teaching and learning setting. Generally speaking, these above disciplines have found methods and strategies to be successful in the way they impact student learning, and this impact occurs in a positive way not only for the student but also for the faculty, as it informs them for future teaching. Disciplines that are outside the scope of traditional lecture-based, or even small group tutor-led teaching have had to create their own methods of assessment, and this can be seen for example in the health profession. Traditional multiple-choice bubble-tests, standard essay, or even written assignment models do not apply as an appropriate assessment tool to test student achievement on the content being taught. The strategies that the arts, such as dance, theatre, and specifically music, have employed for assessment have always been ‘performance’ based, both as type of assessment and as a literal explanation of the process. The applied music studio, where students learn individually, in the music conservatorium has come late to the ‘assessment movement,’ perhaps because, according to Schleuter, “good, bad, and inefficient methods and techniques [including assessment] of teaching music persist though unquestioned adherence to tradition” (Schleuter, 1997, p. 20). The Western music conservatoire has been in the business of ‘conserving tradition’ for hundreds of years. Performance disciplines such as music are usually taught via the master-apprentice model, whereby the student comes to learn once a week in a very focused,

complex environment, one-to-one with the master teacher, typically a recognized performing artist. The nature of formative assessment has, in the past, been seen in feedback throughout the session. It refers to technique, musicianship, and stylistic features. The formal, summative assessment typically occurred at the end of the semester in the form of a performance, called a jury, and was graded by an unspoken global system between expert faculty judges. Judges are applied performance teachers and are experienced performers of, and listeners to, music at very high levels. Remarkably, these end-of-semester jury performance exams have ranked high in inter-rater reliability (Bergee, 2003). In some cases, criteria have been debated between judges, often heatedly, as to their importance at this final performance stage. After discussion between the judges, the final grade was given to the student on a form with some comments about improvements or achievements. In some parts of the United States this *modus operandi* still exists, yet in others it is markedly different. The applied music studio, and the use of assessment within, has only been investigated and thus reported on over the past 20 years. It is with optimism that a new wave of research emerges highlighting inclusion of assessment as part of the teaching and learning process.

Examining the work that some of the leading music performance assessment researchers have conducted, a similar trend can be seen in strategies, but interestingly there is sparse connection in literature reviews to other disciplines. The music education researchers pioneering this line of inquiry are moving in a similar vein to much of the literature discussed in this paper, especially in the areas outlined by Shepard (2000), namely dynamic and ongoing assessments, feedback, transfer, criteria, and self-assessment. The current paper will proceed to illustrate some of this research and offer practical implications for developing performance assessment tools.

Historical Perspectives

The applied music studio has been embedded in Western art music since its earliest settings, and most will recognize this teaching and learning setting as the 'master-apprentice' model. Almost all musicians in Western Art music genre have learned their musical skills through this traditional method, and by speaking about Western art music, popular music and informal learning are excluded because those teaching and learning settings are usually markedly different. Assessment is part of the teaching and learning setting and the development of skills. Colwell (1971) suggested that "it is often thought that music teachers are against systematic evaluation because they fear the exposure of poor teaching" (p. 41), and he added that a

more important reason might be the "conservatory atmosphere." He states that "conservatories are trade schools; their emphasis is on the development of specific skills ... these skills are constantly evaluated ... lessons, recitals ... are constantly filled with evaluation" (p. 41). Applied faculty are making assessments and evaluations, and have been doing so for many years, particularly in the 'conservatory atmosphere,' so there is much to be gained from examining the research literature for insight into how this is being done.

Mills (1987) has suggested that in the Western art music tradition of assessment, a vocabulary is used in the discussion of performance for the purposes of evaluation, and some applied faculty prefer the verbal openness of the comment sheet at recital or jury time to convey feedback about a music performance. There is a long held oral tradition in the applied studio, and the vocabulary is often instrument-specific. The work of Duke (1999), however, has identified teacher feedback as a specifically useful tool used in lessons given in the Suzuki school method. The term *feedback* is usually used in music education literature to refer to instant reinforcement that occurs within short teaching frames, whereas the term *assessment* is generally used synonymously with grading or summative evaluation. Feedback in applied music lessons occurs with much higher frequency, similar to the tutor model of feedback that Shepard (2000, p.11) cites from Lepper, Drake, and O'Donnell.

Duke & Simmons (2006) reveal that musical goals and expectations are prominent elements in lessons given by internationally renowned artist-teachers. The connection between these goals and expectations and the assessment points for measurement or evaluation are not made by Duke & Simmons; however, it is clear that the expectation of the artist-teacher is that the student play in a lesson as if they are performing on stage in order to achieve "a high standard" (p. 12). This type of feedback is conveyed to the student consistently, and it is reasonable to assume the student knows that this expectation continues to prevail in the jury or recital setting. The jury or recital setting is predominantly the authentic or performance assessment, in the truest sense of the word 'performance.'

The works of Bergee (2003) tested the reliability and validity of specific criteria rating scales, or rubrics, in the college applied studio setting in an attempt to create tools that would be reliable and valid for the summative assessment of musical performances. His findings support the concept that the criteria help the applied music faculty grade more consistently in the jury setting, and Bergee also showed that they grade with more reliability if they use a tool with specific criteria as opposed to giving a 'global' grade based on an overall impression of the performance. The use of a

Table 1
Brass Criteria Specific Performance Rubric

Assessment Categories	Acceptable 14-15	Proficient 16-18	Exceptional 19-20	
Interpretation / Expression (Includes dynamics)	<ul style="list-style-type: none"> Has acceptable stylistic qualities Makes some attempts to play with stylistic appropriateness Plays with a reasonable musical effect Make regular attempts at pleasing phrasing 	<ul style="list-style-type: none"> Has proficient stylistic qualities Usually plays with stylistic appropriateness Plays with proficient musical effect Consistently uses pleasing phrasing 	<ul style="list-style-type: none"> Exceptionally stylistic Always plays with stylistic appropriateness Plays with exceptional musical effect Always uses the most pleasing phrasing 	20
Tone	<ul style="list-style-type: none"> Tone, in general is acceptable Tone is mainly consistent across registers 	<ul style="list-style-type: none"> Tone, in general, is clear Tone is maintained proficiently across registers 	<ul style="list-style-type: none"> Tone, in general, is extremely clear Tone is exceptional across all registers 	20
Intonation	<ul style="list-style-type: none"> Intonation is adequate but is inconsistent some of the time within the player and / or accompaniment Demonstrates some understanding of tonality 	<ul style="list-style-type: none"> Intonation is proficient and only small inconsistencies appear within the player and / or with accompaniment Demonstrates proficient understanding of tonality 	<ul style="list-style-type: none"> Intonation is exceptional and no inconsistencies appear within the player / and or accompaniment Demonstrates exceptional understanding of tonality 	20
Technique	<ul style="list-style-type: none"> Shows acceptable posture Holds instrument with competence Plays correct notes (fingering and / or pitching) Has acceptable specific technical skills – transposition, clefs, mute changes, hand-stopping Shows minimal problems with embouchure 	<ul style="list-style-type: none"> Shows good posture Holds instrument with confidence Plays correct notes with confidence (fingering and / or pitching) Has proficient specific technical skills – transposition, clefs, mute changes, hand-stopping Shows no problems with embouchure 	<ul style="list-style-type: none"> Shows great posture Holds instrument with bravura Plays correct notes all the time with exceptional confidence Has exceptional specific technical skills – transposition, clefs, mute changes, hand-stopping Shows strong embouchure 	20
Rhythm / Tempo	<ul style="list-style-type: none"> Short periods of consistent tempo Melodic rhythm approximately correct Tempo changes sometimes observed from music Sometimes rushing/dragging 	<ul style="list-style-type: none"> Consistent tempo most of the time Melodic rhythm consistently correct Tempo changes always observed from music No disruptive rushing/dragging 	<ul style="list-style-type: none"> Tempo was consistent all the time Melodic rhythm precise all of the time Tempo changes always observed with exceptional skill Never rushing/dragging 	20

specific tool in the applied studio measurement process is innovative yet has not been embraced by many conservatories or music departments. The criteria rubrics are typically analytic rubrics where the elements of the musical performance are identified individually, with descriptive statements across a continuum of scoring illustrating the levels of attainment. See Table 1 for an example.

Parkes (2007) tested the use of a criteria-specific performance rubric with applied faculty ($n = 5$). She tested both student and faculty attitudes towards assessment prior to the use of a criteria specific performance rubric in lessons and juries. She then post-tested students and faculty to attempt to ascertain the perceived benefits to either students or faculty. She

found some resistance from the faculty in using the tool, to some degree because they did not perceive a need to use a measurement instrument in an otherwise unchanged protocol of jury comment-sheet grading. Her rubrics, for brass and woodwind instruments, both yielded internal consistencies of .97 and .93 respectively, but her findings in regard to student and faculty perceptions about the use of the rubric were not significant due to low participation. The later work of Parkes (2010) found that when used for self-assessment, a criteria specific performance rubric assists students in a more learner-centered approach to their improvement. One applied faculty professor offered to use the performance rubrics with her students during lessons, and she also asked students to use the

rubric to evaluate their own performances, which were recorded in each lesson. The professor additionally asked the students to reflect each week in an online journal about their playing and what they heard while evaluating themselves with the rubric. Findings from this pilot case study suggest that students had positive perceptions about the rubric, that their awareness about their own improvement was increased, and they had a clear understanding of what was required by their professor each week. These findings support the notions of Shepard (2000) in regards to transparency of assessments and increasing students' responsibility for their own learning.

Oberlander (2000) didn't examine the use of specific measurement tools in the applied studio, but she did investigate the grading procedures in general. She showed that the overwhelming majority of clarinet instructors in the Northern USA and Canada give grades for applied studio learning based on effort and improvement. Oberlander recommended that a fixed criterion be used in determining final grades to gain a higher level of objectivity, which supports the works of Bergee and Parkes. Oberlander suggested determining in advance what level should be reached in order to pass particular criteria; keeping a written record of each lesson, and possibly assigning a grade for each lesson; and having final grading techniques involve a screen to maintain anonymity of the students. The findings of Oberlander support Shepard's (2000) commitment to transparency of criteria in assessments and contribute to the overall dialogue about what could improve assessments in the applied studio.

The work of Ciorba and Smith (2009) was initially conducted in response to the recent push from accreditation bodies in requiring the implementation of specific assessment tools. In this study, a multidimensional assessment rubric was administered to all students performing a jury recital ($n = 359$). The results of this study indicate that there was a high degree of inter-judge reliability where reliability coefficients were above .70, which is not surprising. However, of more interest is the process by which the rubric was developed. It was not solely developed by the researchers, as in the work of Bergee and Parkes, but by a panel of faculty who, over the course of one semester, identified common dimensions shared across all areas and created descriptors outlining the various levels of achievement. The panel then piloted the rubrics over the following two semesters to refine the rubric and the practicality of its use in a jury or final performance setting. The rubric was used across all instrument and voice areas, and the findings reported that performance achievement was positively related with participants' year in school, with a one-way multivariate analysis of variance. This indicates

that when a faculty group get invested and involved with what they are looking for in student achievement, they can create assessment tools that meet their needs. In line with Shepard (2000), this study exemplifies the importance of providing feedback for students and making the criteria clear as to the characteristics of excellent performance.

Conclusion

The features of assessment as explained by Shepard (2000) can be seen in the higher education literature across several countries and, more importantly, the research of music performance literature. The practical solutions that performance arts such as music have adopted are remarkably similar to Shepard's notions of what constitutes effective assessments. By attempting to use performance assessment rubrics within lessons and at the end of semester, Parkes (2010) illustrates the potential for this type of ongoing feedback for students. By using criteria-based feedback, both Bergee (2003) and Ciorba & Smith (2009) make the case for improving faculty specificity and improving student performance. Oberlander's (2000) suggestions also highlight the need for clarity in criteria. It is important to recognize these findings and seat them in the higher education literature as they represent valid and reliable ways to measure what can sometimes be seen as a 'subjective' discipline. Faculty who participated in the music performance research studies had to outline for themselves what excellent performance should look like and then bring these expectations to their colleagues and students. The notion of transparency in assessment is required for assessments to capture student achievement reliably. Music performance assessments are moving away from "the secret nature" of past practice that has been criticized by many (Brand, 1992; Jones, 1975; Madsen, 1988, 2004; Schleuter, 1997). By examining and defining the required components of music performance, researchers in this area have been able to move this discipline forward, creating the critical link between teaching and learning in more applied music settings. The concept of true 'performance assessment' is seen in this subset of research, and it is garnering some momentum in the ways applied music performance faculty are teaching and their students are learning. This move is a positive one and perhaps one from which other disciplines may benefit. Such benefits might start with promoting good communication between faculty, fostering a desire to remove the secretive or subjective nature of assessments, developing a willingness to embrace new methodologies, and ultimately testing and refining their effectiveness in the teaching and learning setting.

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