Valuing Individual Differences Within Learning: From Face-to-Face to Online Experience

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The Internet has the potential to connect global communities of learners who share a common interest and yet who have diverse cultural backgrounds and experiences, which shape their current understandings. This paper describes and reflects upon the ways these individual differences in experience and understandings are valued and placed at the centre of the student learning experience in an online module of a Professional Doctorate in Teacher Education program. It explores how the online learning experience has been developed to leverage from successful face-to-face implementation and identifies differences between the two modes, in particular the added value of working online. Issues related to the nature of the support mechanisms necessary for successful online learning are discussed. This development was part of collaboration between the University of Melbourne, Australia where the online technology was developed and the University of Nottingham, United Kingdom, where the course is offered. Parallels between the online collaborative work experiences of the international partner developers and students are highlighted.

This paper provides a reflective account of the conversion of a one week residential summer school module, 'Contexts for Teacher Education," part of a Professional Doctorate (EdD) in Teacher Education, to a collaborative online learning experience which builds upon the individual differences – cultures, understandings and experiences – of the learners. The online learning environment design draws on the past experience of the successful face-to-face course, underpinned by a common set of pedagogical principles for active adult learning. The challenge is to capture in online form some of the nuances of the face-to-face setting, but also to explore and exploit new possibilities offered by the online format. In order to sensitively meet these needs, a flexible online development environment was used to augment standard functions available in the WebCT Learning Management System (LMS). The following sets out the background to the online module, the pedagogic rationale and the activities that support online knowledge sharing and generation. The benefits over face-to-face delivery are also explored.

Background

The EdD in Teacher Education is a research degree course for full and part-time students run since 1998 by a team of lecturers in the School of Education, University of Nottingham. The program consists of taught and research stages centered around comparative studies of teacher education programs. Four core taught modules are studied over a period of two years part-time, broadly providing opportunities to develop student understanding of the main principles and issues underlying teacher education and the global and local research agendas that accompany these. Students are not only introduced to the research skills and methodologies required to complete their research, but are provided with opportunities to further develop and articulate their own research agenda in preparation for the following two year part time research phase, during which they produce a major thesis.

The course was originally offered as a mixture of online and summer school residential modules, but in 2003, it was run fully online to widen its accessibility. Students are mainly in mid-career with a wide range of professional and family responsibilities; they are quite capable of organizing their lives to work at this level if the cost and the requirement for visits to the UK were removed. As the final research phase of their course would require fieldwork in their own countries, ways of supporting this at a distance made more sense than requiring visits to the UK. There are currently 14 students studying online, in Hong Kong, Canada, China, Cyprus, Greece, Cayman Islands, Jamaica, Poland, and the UK.

The Challenges for Course Design

Professional doctorates set a particular context for learning contrasting with regular undergraduate education. They generally attract participants who view their own personal development and academic ambition as fully integrated with their professional development and have a commitment to furthering their profession (Bourner, Bowden, & Laing, 2001).

[It is] important that higher education accepts the responsibility for producing the critical thinking and critical thinkers that will seek to surpass and transform current conceptions and practice in [their] professions. (Bourner et al, 2001 p.81)

TABLE 1
Course Design Challenges in Terms of Student Starting Position and Course Expectation

Course Expectations	Student Starting Position
The need for constructivist pedagogies that support engagement with critical thinking and understanding.	A possible pedagogic preference for a transmission mode of learning, but this will vary.
The need to work in a variety of online modes, for example, individual research and collaborative problem solving.	Varying expertise in learning online.
The need for the doctoral research to be informed by and inform the global agenda in teacher education.	A familiarity with local issues and an interest in pursuing research around a local problem in order to improve local practice.
The need to develop analytic and theoretical interpretations of data.	A tendency towards description rather than analysis, but this will vary.
The need for constructivist pedagogies that support engagement with critical thinking and understanding.	A possible pedagogic preference for a transmission mode of learning, but this will vary.

There are, however, important differences in the starting points of individual EdD students and such expectations. The ways these have been interpreted for the course is summarized in Table 1.

This gap presents a challenge to be able to accommodate variation between students' backgrounds, needs and expectations, while harnessing the opportunities provided by such real-life differences as the foundations for an engaging, multi-perspective learning experience involving adult learners.

Requirements for a Rich Environment for Active Learning (REAL) for Adults

Notions of adult learning (Knowles, 1990) and Grabinger and Dunlap's (2000) Rich Environments for Active Learning (REAL) have informed the design of both face-to-face and online learning modes. Table 2 outlines REAL pedagogic principles and the ways these have been incorporated into the Contexts for Teacher Education module in the EdD in Teacher Education course. A key feature of a REAL is that not only are there opportunities for knowledge creation, but that these are situated within authentic interactions. This authenticity is shaped within the module described in this paper by using an activity that generates 'new' knowledge that is directly relevant to the students' individual studies/interests and utilizes appropriate higher order and research relevant thinking skills. These learners genuinely hold expert knowledge that will be new to the others studying the module. It is the deliberate use of this situation that aims to establish a notion of the need to belong to and participate within the group, and to ensure students feel part of a professional community (Wenger, 1998).

From Mixed-Mode to Online Delivery

The Contexts for Teacher Education module, originally piloted as a one-week summer school class, required students to develop, apply and revise a framework for the analysis of any given Teacher Education programme. Figure 1 outlines the module activities and their alignment with the pedagogic principles of Table 2. In the face-to-face setting, various forms of interactive group activity and classroom discussion provided rich opportunities for social construction of knowledge, generative learning and sharing of diverse real life experiences. Students reacted very positively to this part of the module. The notion was to 'celebrate' their diverse perspectives, to encourage them to consider some different perspectives through wider reading, and then through small group work, peer review and a classroom negotiation process carefully nurtured by the tutors, arrive at a consensus on a workable framework for analysis, which could be used on case studies and further revised. The challenge was to move this particular learning experience to the online mode.

Requirements for an Online Learning Environment

In re-developing the course into fully online mode, the role of technology should be to support, rather than dictate, an underlying pedagogic design.

> Most of the claimed strengths of networked (online) learning have their roots in both the technology and the ways in which the technology is used. The technology alone won't deliver the desired benefit - except by lucky accident. (Goodyear, 2000, p. 18)

High level Learning Management Systems (LMS), such as WebCT or TopClass, certainly bring a range of functions, such as discussion boards, email, quizzes and collaborative learning spaces, that offer the promise of enriched student learning. Despite their widespread adoption, however, there is little research into their pedagogical impact (Coates, James, & Baldwin, 2005) and concerns have been raised are that these systems have been largely based on training-type models, with

TABLE 2
Pedagogic Principles Underlying a Rich Environment for Active Learning (REAL) for Adults

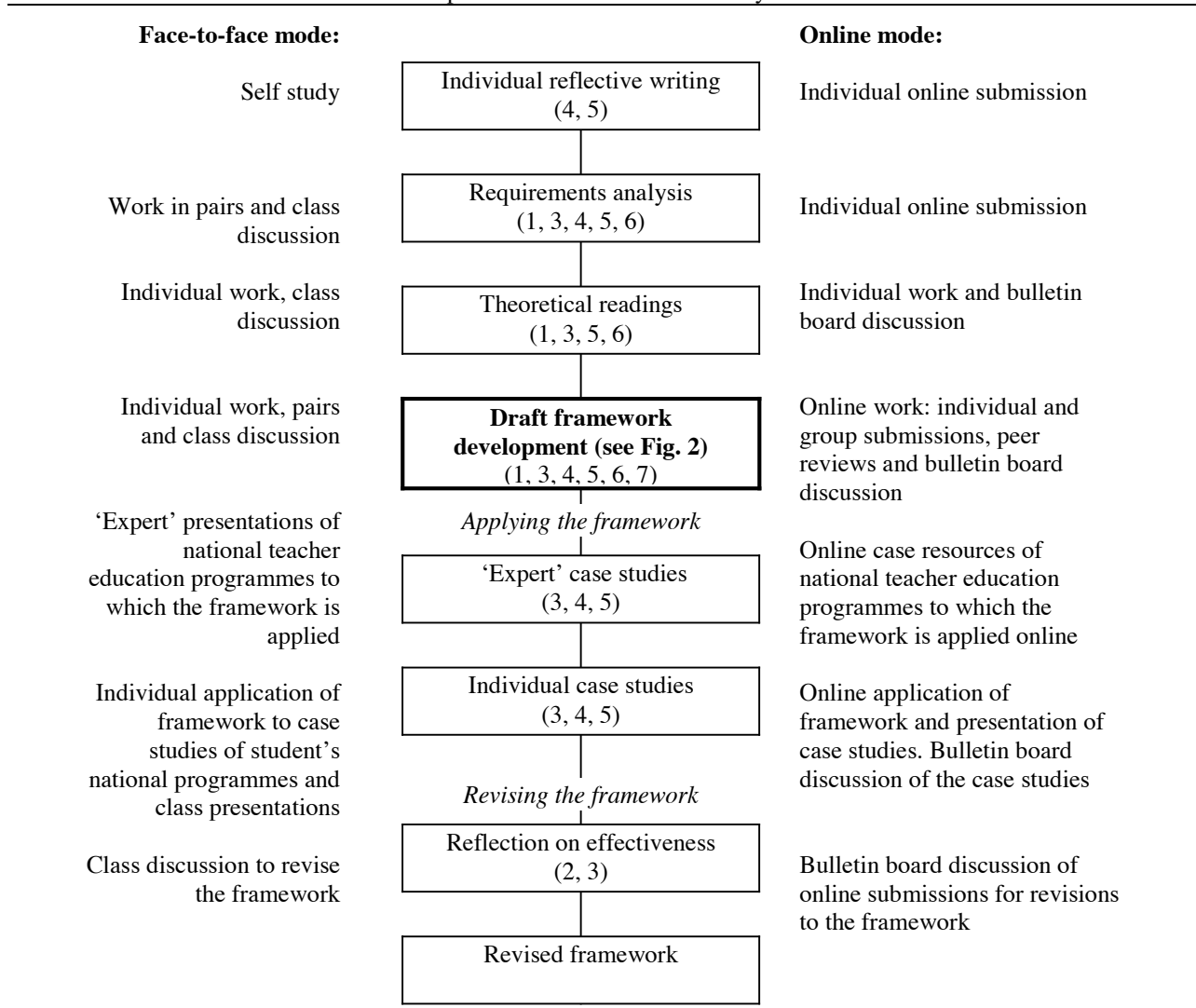| Pedagogic Principles	Design Features of the Learning Experience
1. Social construction of knowledge – that learning is enhanced through the process of communication of ideas, which involves interaction and reflection (Vygotsky, 1962).	Opportunities are structured for students to reflect upon and organize their ideas, communicate and discuss them, and then further reflect upon them.
2. Transparency of action – learners need to know why they need to learn something before undertaking to learn it (Knowles, 1990).	The pedagogy underlying the module is studied as part of the module and rationales for the roles of both tutors and students are related to this.
3. Experience is valued – experience is a 'subjective' resource that can be applied to learning (Knowles, 1990).	Experience is used as a starting point and is returned to. For example, students develop a case study based on key issues related to their own practice.
4. Authentic activities – learning is oriented to the application of knowledge and problem-solving that relates to the learners' real life contexts (Grabinger & Dunlap, 2000).	A key outcome of the module is a draft set of research questions for each student. The activities used ensure these are informed by theory and global issues and involve the development of key research skills such as critical thinking.
5. Generative learning – organizing knowledge into a structure that reveals relationships between ideas, conflicts, and gaps in knowledge (Dunlap & Grabinger, 1996).	A framework for analyzing teacher education programs is developed collaboratively and is used to critically analyze case studies of teacher education programs in order to highlight a research agenda for Teacher Education.
6. Diversity of 'voices' – voices of key writers, policy makers, practitioners, and students are included to ground theory to practice.	Key readings, expert presenters, student case studies, discussions between teacher educators about practice are used.
7. Assessment encourages higher order learning and supports engagement in all the learning activities.	The assignment involves a reflection of the learning process and on the development of the critical thinking that led to the research questions developed by the student.

an "overly simplistic understanding of the relationship between teachers, knowledge and student learning" (Coates et al., 2005, p. 26-27). The need for more sophisticated and creative functionalities capable of addressing the specialised needs of different institutions and discipline areas is also reflected in proposals for more extensible architectures for learning technology, for example, the Open Knowledge Initiative (Collier & Robson, 2002). From our own experience, the application of an LMS to a carefully structured collaborative and reflective learning environment, blending individual and group work, has proved more difficult than anticipated (Fritze, 2003; Kemm, Williams, Kavnoudias, Fritze, & Stone, 2001). In this case, the additional load of bringing students up to speed with the multiple tools and task steps, and staff intensive monitoring of individual and group work across the different tools ultimately made this learning design unsustainable with standard tools.

Our approach to implementing the online version of the Contexts for Teacher Education module was to use WebCT functions where possible, but where more carefully structured discourse was required, to explore the use of an alternative technology that would more readily blend in with, rather than dictate, the pedagogical model.

The Online Courseware Component Architecture (OCCA) Web server/database was developed at the University of Melbourne to support the creation of highly flexible learning environments based on low-level learning and teaching 'transactions' (Fritze, 2003). An OCCA web site contains initially no predefined functions for either learning or teaching. Instead, all learning activities, course structures and administrative tools are defined by different web pages in which students, teachers or groups can (a) submit information to the database via standard html form elements, and/or (b) view specific information recalled from the database via specialized html 'tags.' As a simple example, a single student page might display a previous attempt at a question; feedback entered from a tutor's page; a form to enter their refined response; and another for reflection on what they have learned. With even simple additional program coding, highly optimised pages can thus be created by the course designers to structure the online exchange of information between students, groups or teachers in a manner reflecting the pedagogic requirements of the course. A number of curriculum projects developed using OCCA have demonstrated its capacity to support innovative learning environments that incorporate reflection, group work, peer review, learning portfolios and customized tools for teachers, primarily supporting on-campus activities (Fritze, 2003). The Contexts for Teacher Education module was to extend this to wholly online form while maintaining the educational qualities of the previous mixed-mode

FIGURE 1
Module Activities that Led to the Development of a Framework of Analysis for Face-to-Face and Online Modes.[1]

Face-to-face mode:		**Online mode:**
Self study	Individual reflective writing (4, 5)	Individual online submission
Work in pairs and class discussion	Requirements analysis (1, 3, 4, 5, 6)	Individual online submission
Individual work, class discussion	Theoretical readings (1, 3, 5, 6)	Individual work and bulletin board discussion
Individual work, pairs and class discussion	**Draft framework development (see Fig. 2) (1, 3, 4, 5, 6, 7)**	Online work: individual and group submissions, peer reviews and bulletin board discussion
	Applying the framework	
'Expert' presentations of national teacher education programmes to which the framework is applied	'Expert' case studies (3, 4, 5)	Online case resources of national teacher education programmes to which the framework is applied online
Individual application of framework to case studies of student's national programmes and class presentations	Individual case studies (3, 4, 5)	Online application of framework and presentation of case studies. Bulletin board discussion of the case studies
	Revising the framework	
Class discussion to revise the framework	Reflection on effectiveness (2, 3)	Bulletin board discussion of online submissions for revisions to the framework
	Revised framework	

[1] Numbers in boxes refer to pedagogic principles in Table 2

course model and a sustainable administrative load.

The Draft Framework Development Activity – A Generative Learning Process

The Draft Framework Development activity (see Figure 1) represents a key learning component of the module, indicated by its support of many of the pedagogic principles. This activity, through which individual understandings and experience are shared and reconciled, provides a particular test of an online environment to facilitate a learning experience that would compare with class discussion. Figure 2 indicates the revised structure of the activity, which occurs over a period of weeks, rather than days within the classroom setting. Each box represents a specially crafted Web

page through which each task is undertaken. The OCCA environment makes it possible for the work within each task to be automatically incorporated into later ones, and for unique collaborative activities to be constructed, such as the voting and categorization tasks. In addition, students have access to an online 'portfolio' progressively summarizing their work, and tutors have optimized pages to view students' work, submit individual, group and global comments, and configure exercises.

In the face-to-face mode the module tutor necessarily had to (a) mediate the experience for the students ensuring each was engaged and supported, and (b) keep the work aligned to the timetable that was necessary for the collaborative work to occur. This role was equally important for the online module.

FIGURE 2
OCCA Pages for the Online 'Draft Framework Development' activity.[1]
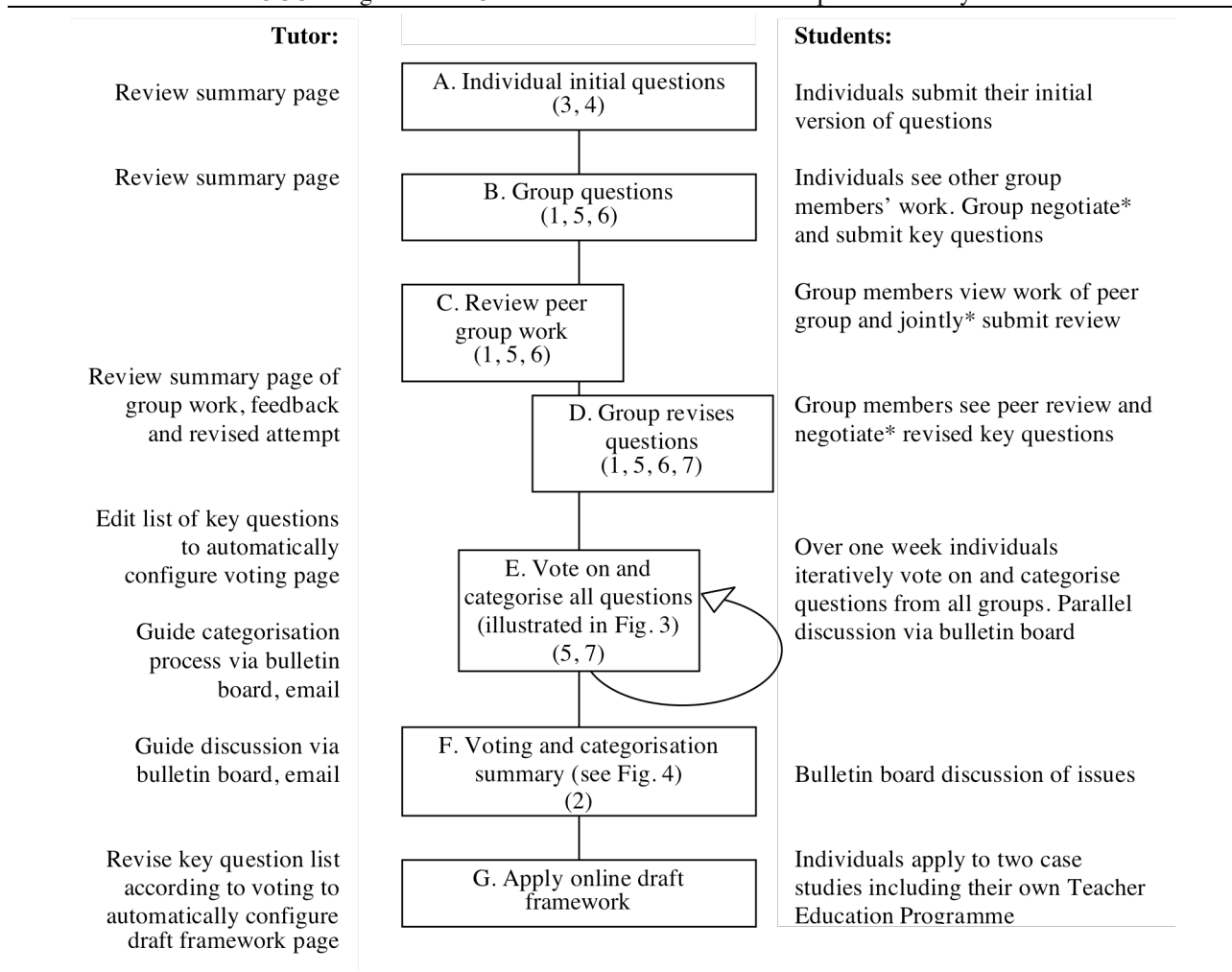
[1] Numbers in boxes refer to pedagogic principles in Table 2.
* Group negotiation occurred using email, phone, or text messaging.

Here it was primarily facilitated through an OCCA page overview of activities containing the latest tutor instructions and feedback, supported by tools for monitoring student online submissions and setting global and individual feedback messages. These OCCA-based functions were complemented at different stages by the use of email and bulletin board discussions in WebCT, which also provided a front end for online delivery of the course.

The Draft Framework Development activity starts with students individually submitting their initial thoughts about questions necessary for the framework for analysis (see Figure 2, Box A). In the group questions page, these are shared within online groups of two or three, who in turn jointly develop and submit a revised version of these questions (see Figure 2, Box

B). Negotiation within the groups takes place via email, phone, or text messaging as best suits the individuals.

Such opportunities for the students to work within individual and small group perspectives mean that there can be a strong tendency for ideas to diverge (Hewitt & Teplovs, 1999), yet there was a need to move to a negotiated convergence. While this tends to occur naturally within the classroom setting, for the online course, such a process needs to be specifically facilitated at different levels. In the peer review pages (see Figure 2, Box C), for example, students are given the opportunity to review the ideas of another group and to collaboratively revise their own effort in the light of such feedback (see Figure 2, Box D). 'Scavenging' for good ideas/questions is also part of consensus building within the peer review process.

FIGURE 3
Categorization of Proposed Students' Questions: Adding A New Category

#	Question	Score	Category	Add new category
1	What is the underlying philosophy and rationale behind the teacher education programme?	3		Conceptual_basis
2	To what degree does the curriculum prepare students to work in multicultural settings and for their work in schools?	4	Curriculum_Design	
3	How far, can we as teacher educators rely on the strategies, which are suggested for the development (and improvement) of the programme?	3	Quality_assurance	

Of particular interest was evidence from the student portfolios that wider reading tended to provide opportunities for divergence and the inclusion of new ideas/questions in the framework, which was not the case for the face-to-face delivery mode. Though this meant the convergence process was more complex, the quality of the framework for analysis was clearly being enhanced.

Convergence of ideas was most graphically illustrated in the 'Voting and Categorisation' page (see Figure 2, Box E), where students individually categorise and assess the collated list of key questions for assessing the quality of a teaching strategy generated by all groups. The online activity page is illustrated in Figure 3. The challenge was to provide some structure to the creation of categories as well as an efficient means of reducing the number of questions. In the face-to-face, as well as the online approach, groups decided upon the questions and ascribed categories to them. In the face-to-face approach questions devised by the groups were digitally displayed to the whole class and discussed one at a time and decisions were made in relation to the category that should be applied as well as the value of the question. This process, which took several hours, allowed for a sharing of professional knowledge and experience and required careful facilitation to move the diversity of ideas to an agreed consensus in which questions were accepted, discarded or merged with others or modified in some other way. This synchronous activity could not be repeated online with the large number of questions

and categories generated due to the different time zones and the personal and professional commitments of the students. The voting and categorization approach was used in the online version as a first step in reducing the number of questions and of sharing ideas about the range of suitable categories. The outcome was then more amenable to an online discussion to further refine the framework.

Initially no options are provided in the 'Category' popup menus and it was up to the early student pioneers to propose some within the 'Add new category' boxes (see Figure 3). When a page is submitted, these new categories then become available to all students in the popup menus. Thus students have the opportunity to view the emerging categories, select ones they feel are appropriate or add new ones themselves. Categories no longer referred by any student disappear.

Through the medium of these web pages a dynamic online discourse occurred over a number of days. Some categories converged while others remained contentious and these differences were resolved in the subsequent bulletin board discussion.

This voting and classification process generated an artifact illustrating the shared understandings and conflicts. That is, the framework that emerged after voting showed all the questions grouped under the main categories together with their mean score and was displayed to students (and tutors) as a summary page developed by the tutor from the summary that OCCA provided (see Figure 4).

This tutor modified summary in turn became the

FIGURE 4
Progress Summary on Categorization Process

N	The question	Total	n	Av	Categories
1	What is the underlying philosophy and rationale behind the teacher education programme?	47	12	3.9	Appoach_to_TE Programme_Design Curriculum_Design Conceptual_basis(7) Approach_to_teacher_education Teacher_Education_Policies
2	To what degree does the curriculum prepare students to work in multicultural settings and for their work in schools?	47	12	3.9	Programme_objectives Curriculum_Design(7) Lifelong_learning curriculum*_relevance_(3)
3	How far, can we as teacher educators rely on the strategies, which are suggested for the development (and improvement) of the programme?	34	12	2.8	Role_of_teacher_educators Stakeholder_Collaboration Evaluation reflective_practices Strategies_used_for_developmen(4) Programme_support Quality_assurance(2) Teacher_Assessment
4	How can schools and	43	12	3.5	Programme_Design

basis of discussion (see Figure 2, Box F) to move to a consensus on which questions to finally select, how they might be adapted, merged, or regrouped. Terms were also clarified.

Individual perspectives were also then allowed to continue to develop through application of the framework to the case studies as a means of further refining the framework and of developing individual/group understanding (see Figure 2, Box G). All up, the six groups produced 121 questions in total with over 40 different categories, each question attracting between one and ten categories. After voting, 33 questions remained and these were grouped under 12 categories to be further refined through a bulletin board discussion into the final revised framework.

A number of interesting outcomes of the online activity emerged. Due to the anonymous nature of the submission of the framework for analysis questions, there appeared to be a tendency for individual ideas to remain within the voting process, working to some extent against consensus building, as evidenced by the wide range of categories for each question. This situation contrasted with that in the face-to-face sessions where despite the efforts of the tutor, perceived power relations influenced proceedings – these were to some extent as a result of the different levels of competence in English within the group. Another advantage of the online approach was that it enabled

individuals the time to explore a wider literature base that related to their cultural perspectives and to share these articles with others via the bulletin board while constructing the framework. It was noted that active use of the bulletin board varied, although all students read the contributions. The process was more reflective than in the face-to-face mode due to its extended nature and the ways individual perspectives were encouraged. This was supported by the fact that the students' developing contributions in OCCA and their peer feedback were stored in their private portfolios and could be viewed at anytime for them to consider their current understandings and perspectives in relation to the developing group perspective. Tutors also had access to student portfolio views and other summaries of student submissions at different stages.

Support Mechanisms Necessary for Successful Online Collaborative Activities

A key skills framework (Bennett, Dunne, & Carre, 1999) was used to support the students in developing and reflecting on their abilities to work collaboratively in order to complete the activities. Students reported in the bulletin board that they valued this; however, the experience of running the module indicates that this framework needed to include higher order information and communication technology (ICT) literacy skills. As

the module drew on multiple online tools, involved significant new pedagogical functionality in OCCA and the local situation of students varied widely, some technical problems were inevitable. For example, some institutions do not allow installation of non-standard software, such as an alternative browser, which meant we could not assume any particular computer configuration. Testing for all eventualities will always be limited.

Students handled technological problems in different ways. Some accepted the inevitable frustrations and explored solutions readily, while others viewed these interruptions as problematic and became anxious. Lewis and Atzert (2000) suggest that computer-related anxiety and frustration can be defused by encouraging students to critically reflect on various aspects of the new communications technologies and to promote self-learning rather than dependency. Interestingly, the groups that were established for the work provided a peer support mechanism for some and the tutor became aware of this where problems persisted through subsequent emails (Joyes, 1999). This aspect of ICT literacy, the need to flexibly work around problems, is clearly something that the course needed to signal alongside the other higher order key skills.

Parallels Between the Student and Developers' Experiences

Asynchronous online working is well documented as being useful in developing reflective and high quality outcomes (Goodyear, 2000) and OCCA supports this through a structured sequence of activities that encourage the articulation and sharing of perspectives. However, there are times when students deem synchronous working essential. Despite time zone differences, students tended to work both asynchronously (e.g., email and bulletin boards) and synchronously (e.g., phone, text chat or audio linkup) within their groups, depending on their technological capacities and preferences. This also reflected the developers' preferred mode of collaborative working, using synchronous audio. Despite the difficulty of arranging a suitable common time between the UK and Australia with an 11 hour time difference, we found the immediacy of communication not only allows rapid progress to be made, but also provides a sense of knowing your e-community that asynchronous working (through emails) does not reveal. Allowing for mixed modes to suit student preferences is perhaps the ideal.

Conclusions and Future Developments

This paper has described how a structured online activity format can provide a practical alternative and even some pedagogical advantages over face-to-face

classes, which are less accessible. This is particularly important if diversity in professional background and knowledge is considered a valued aspect of the learning. Activities, such as the collaborative voting and categorization mechanism, can be conceived within suitably flexible online learning environments that while not attempting to mimic the exact face-to-face interaction process, can provide structured tasks and discourse opportunities that address key principles for an active learning experience. The students case studies of their teacher education programs (see Figure 2, Box G), based on the collaborative framework, provided clear evidence of the ways individual perspectives were valued and developed within this environment. These case studies were critical, reflective and revealed a deep understanding of the key issues – more difficult to achieve during the intense one week residential experience than the online module.

A supportive environment for tutors is an essential aspect of a sustainable online learning approach, requiring both efficient administrative tools and effective lenses on the student learning progress appropriate to the subtlety of the student activity. Support for online students is a critical issue and requires flexible choice in multiple modes of both synchronous and asynchronous communication. This reflects the nature of modern work practice, as experienced also by the authors during the development process.

Work is ongoing in order to refine and automate question grouping in the 'voting and categorization' process in OCCA, but some tutor intervention at this stage is necessary, as complex decisions need to be made. We are planning to extend the use of OCCA further in supporting group decision making in the 'revising the framework' activity currently carried out in the bulletin board. This process may use a voting system similar to the one proposed by Stahl (2002) in which consensus is gained once a certain proportion has voted for a change within a set time limit.

The developed online activity can be re-used within other OCCA-supported courses – it has been incorporated into an online workshop for the recent ePortfolios Australia Conference; alternatively the pedagogical model could be replicated within other flexible learning environments and is influencing developments of other online collaborative tools for learning (Joyes, 2005).

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