# Investigating Students' Perceptions of E-Learning within an Occupational Therapy Program

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***Abstract.*** *Because of the increasing use of technology to enhance learning in higher education, particularly in the professions, the aim of this study was to explore student perceptions of electronic learning (e-learning) within one module of the occupational therapy curriculum at a university in the United Kingdom. Twenty participants sorted 30 statements taken from the literature by indicating how much each statement reflected their own experience of the e-learning component of their program. Following analysis, two factors were identified indicating two distinct perceptions of e-learning. One factor was interpreted as a preference for traditional lectures along with a perception that technology hindered students' learning. The other factor revealed a view that the use of technology was beneficial and a part of students' learning. Using Q methodology showed the interconnectedness of the issues in e-learning. Ways to improve the instructional design of the module to enable students of both views to engage interactively with the content are discussed.*

## Introduction

Online learning is used increasingly in the education sector to increase access, expand the range and quality of learning and teaching strategies, and contribute to lifelong learning through the use of new and exciting technological tools (Department for Education and Skills, 2005). Learning activities supported and enhanced by technology are often referred to as e-learning (Salmon, 2005). E-learning is a way to increase flexibility and access to education especially for the growing population of adult learners who have the demands of balancing work, family, and learning (Waight & Stewart, 2005). Younger students coming to university have grown up using technology and it is an integral part of their lives. They have used technology in school and expect to use it in university (Benfield & Francis, 2005). E-learning provides students with the flexibility to fit college-level learning in with their other obligations, such as part-time jobs (Pereira et al., 2007).

E-learning promotes teaching that is characterized by inquiry-based,

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problem-centered, active, and collaborative learning that can be accomplished across very broad geographic areas. Catley (2005), Laurillard (2002), Sharpe and Benfield (2005), and Damoense (2003) believe that e-learning can be effective when the method and technology used are appropriate to the teaching and learning activity, interaction between students is effectively facilitated, there is timely feedback on the tasks, and access to extensive resources is available.

Rosenblit (2005), Greenagel (2002), and Adams (2004), in contrast, are concerned that e-learning is compromising the quality of education as courses become impersonal and superficial with less face-to-face contact. There is an inappropriate use of technology through the strong emphasis on high technology. Furthermore, the attempt to recreate the classroom in a virtual environment is ineffective. Asgarkhani (2004) and Farrel (2006) voiced concern about the issue of providing appropriate support, as they suggested that e-learning tasks require tutor facilitation to be timely and effective when facilitating large groups in a virtual environment.

Studies highlight the convenience of e-learning for students. In a study conducted by Brinkham and Rae (2005), students reported that e-learning allowed flexible learning with anytime access, a more convenient type of learning. Duffy, Gilbert, Kennedy, and Kwong (2002) studied 154 post-registration nurses enrolled in a distance learning course and found that students believed e-learning "catered for their needs" and took into account their different "learning styles and learning approaches" (p.79). Gibbon (2005), in a study of 20 nursing students, found that students preferred to access the internet at night and reported that the flexibility contributed to learning.

Many studies (Coultas, 2004; Duffy et al., 2002; Gibbon, 2005; Pang et al., 2002; Smith & Buckler 2005) report on the qualities of group work and its contribution to effective e-learning. Pang et al. (2002) found that students built friendships through the use of group work, while Gibbon (2005) found that students enjoyed working in groups, because it led to social cohesion and to learning from each other. Other factors that contribute to learning are awareness of the group process (Berke & Wiseman, 2003) and engaging in group work that leads to increased participation in learning (Duffy et al., 2002; Ramsden 1992).

Pang et al. (2002), in contrast, showed in a study of 15 tutorial groups of 16 students each that the main barrier to e-learning was that students found the technology confusing or had poor confidence in their understanding of the technology. Howatson (2004), in a study of 24 nurses in a distance-learning course, found that they needed technical skills before beginning the course because a lack of technical skills was associated with increased time and lowered motivation to learn.

Howatson (2004) and Sharpe, Benfield, and Francis (2006) found that students who are inexperienced learners found the self-direction difficult and preferred direct tutor contact rather than the isolating experience of e-learning. Pang et al. (2002) and Beasley and Smythe (2004) found that the self-direction was not only difficult but was associated with an increased workload.

While quantitative e-learning studies of students' perspectives are statistically rigorous they do not reflect the deep meaning or attitudes of students. Qualitative e-learning studies, such as those by Timmis, O'Leary, Weedon, Harrison, and Martin (2004), Castle (2004), Creanor, Trinder, Gowan, and Howells (2006), and Lytras, Naeve, and Pouloudi (2002), reflect students' perspectives but are criticized for their lack of statistical rigor (Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005). Therefore, a Q-methodology study was undertaken to explore student perceptions of e-learning in order to better understand the student-learning experiences in the occupational therapy program. Q methodology appropriately combines the strengths of both qualitative and quantitative research methods (Addams & Proops, 2000; Dennis & Goldberg, 1996).

This study explored the perceptions of second year occupational therapy students about the e-learning activities that were conducted as one component of their course. This course (or 'module'), called Occupation for Health, was delivered using a blended-learning approach. A variety of learning and teaching strategies were employed, including face-to-face lectures, inquiry-based learning tasks, and presentations based on case narratives to facilitate achievement of the learning outcomes (Oliver & Trigwell, 2005). Students in groups of eight to ten identified a line of inquiry, which is an ordering of questions to develop a particular argument (Hart, 1998). An example of a line of inquiry was the following: *identify the patients' roles which may be affected by the symptoms of the condition, and then identify the physical or cognitive problems affecting the roles you have identified.* These lines of inquiry are supported with relevant evidence to answer the question posed. Students need to consider their responses before posting them onto discussion boards. Feedback on their responses provided by tutors was not immediate as in a classroom environment but appeared on the discussion board after two to three days. Changes were made to the module following a review, and e-learning activities were used to support the other components of the course. The e-learning component was the only method separately evaluated in this study.

## Method

The Q-sort statements were developed following a detailed review of relevant and recent e-learning literature (McKeown & Thomas 1988).

Statements describing facilitators and barriers to e-learning were generated from the literature, summarized above. Initially, 104 statements were identified and then subjected to a reduction phase to achieve optimum balance, clarity, appropriateness, simplicity and applicability (Cross, 2005). Brown (1997) suggests that statement reduction be done systematically and in terms of concerns about comprehensiveness and representativeness of any given sample. During the reduction phase, the statements were categorized to ensure there was no repetition and statements that were less relevant to the research (e.g., perspectives of educators) were removed. To ensure appropriateness, sample statements were reviewed by a colleague and tested in a pilot study (de Graaf, 2007). A second opinion regarding the decision-making of the researcher in this reduction phase was sought to reduce researcher bias (Corr, 2001). Five statements were rephrased to ensure clarity and remove ambiguity (McKeown & Thomas, 1988). The final pack contained 30 statements (see Appendix).

A large Q-sort grid was developed indicating the shape of the distribution, enabling subjects to place the statements in the positions that they wanted them. The grid was created along a continuum from least strongly matching participants' own perspectives (–3) to most strongly matching perspectives (+3). The column height arrangement was 3, 4, 5, 6, 5, 4, and 3. Cross (2005), argues that use of the forced choice method means that the respondents have to consider their own attitudes carefully through the sorting process. Participants place statements on the grid with their own understandings (Brown, 1997) rendering the operation amenable to a study of subjectivity.

**Administering the Q sort**

A pilot study was carried out with two participants to identify any difficulties with the process of administering the Q sort. Pnina (2009) suggests that pilot studies require a small number of participants who are strategically selected because they provide a wide range of viewpoints informed by a variety of life experiences. For this reason one participant was chosen from the part-time student cohort while the other from the full-time student cohort, which also ensured that the second-year students were adequately represented. Valenta & Wigger (1997) suggest asking participants to check for duplication among the statements, check the clarity of the statements, and comment on the process of sorting the statements. The pilot study revealed that no changes were required to the statements or the instructions given for the sorting process.

**Participants**

Students enrolled in the module were invited to participate, and 20 students consented. Thirteen of the participants studied the course full-

time, while seven studied part-time. Only two participants were male, reflecting the fact that occupational therapy is in the main a female-dominated profession. The profile of participants otherwise represented a cross-section of the student cohort.

Because the study was undertaken after the end of the academic year, a decision was made to create an e-format of the Q-sort pack to allow students the flexibility of participating in the study at a time suitable to them. The online data collection was beneficial on two levels: it meant that students had the flexibility to complete the Q sort remotely at a time convenient for them and the time needed by the researcher to collect data face-to-face was also reduced, keeping data collection and input time to a minimum for the researcher (Schmolck, 2007). However, van Exel & de Graaf (2005) believe that mailed or online Q sorts are not a desirable option unless the participants are located in a wide geographical area or if the researcher is avoiding the costs of administration. Since the students had completed the academic year and moved back home, access to these students was more effective online. Students who are less confident about their technology competence may have been dissuaded to participate in the study.

**Analysis of Data**

The factor-extraction method used was principal component analysis with varimax rotation (McKeown & Thomas, 1988). Sorts were flagged if they achieved statistical significance on only one factor. McKeown & Thomas (1988) suggest that factors defined by more than three or four individual sorts are stable sorts. Considering this guideline, three significant factors were initially extracted for analysis. But two factors were highly correlated, thus only two factors were retained for interpretation.

## Interpretation of Results

The final step of analysis is the interpretation of the factors using the statements with the highest positive and negative z-scores, the distinguishing statements for each factor, comparisons of statements across factors, and consensus statements. Two factors were interpreted as Traditional Lecture Learners and Techno Learners.

**Factor 1: Traditional Lecture Learners**

The 11 students whose sorts defined this factor were all mature students who revealed an apprehension about e-learning. Their preference is for traditional lectures where there is more face-to-face contact. The students showed a dislike for the lack of instant feedback in the e-learning mode, compared with face-to-face teaching, which allows the tutor to give students ongoing and timely performance feedback. Face-to-face feedback gives a sense of immediate resolution to questions

posed, unlike the delayed online feedback. Interaction with tutors enables brainstorming or discussion that leads to resolution of technical issues through synchronous exchange.

The attraction to lecture learning was not due to a lack of confidence in technology skills. Traditional Lecture Learners disagreed with the statement that there was an improvement in their computer skills after the e-learning task and did not believe their computer skills were inadequate. Therefore, levels of engagement were not associated with levels of technical expertise.

Part-time students attend sessions three days a week and have work commitments for the remaining two days. Interestingly, flexibility and convenience regarding when and where they complete their tasks were not identified as positive aspects. Traditional Lecture Learners found the e-learning components time-consuming.

However, learners who prefer traditional lectures enjoyed the social aspects of learning, such as forming relationships and learning from each other. Students whose sorts defined this factor felt strongly that e-learning allowed them to build friendships. Social learning is a powerful type of learning as it allows for reflective learning to take place through online dialogue with others learners. Students were able to explore ideas and consider possible options when constructing their own knowledge.

**Factor 2: Techno Learners**

The five students whose sorts defined this factor included both mature students and recent secondary-school graduates. This group perceived the benefits of the use of technology as part of the learning process. E-learning complements their learning style and allows a better understanding of the learning material and allows them to be in control of their learning. They favor the flexibility and convenience of this mode of learning and are aware of that e-learning improves their computer skills. Statement scores for Techno Learners suggest that this group values the social aspects of learning, in common with Traditional Lecture Learners.

Students who benefit from the use of technology to enhance their learning have perceived confidence of their technology skills. They also strongly agree that e-learning enables flexibility and convenience of use as they were able to access and engage in learning at a time that was suitable for them. Their experiences in this respect are dissimilar to students who prefer traditional lectures.

## Discussion

There were two dominant views of e-learning among the students in the occupational therapy program. Some of the specific themes that

emerged are discussed in this section. Demographics of students who preferred traditional lectures showed they were all mature students over the age of 38. This group found e-learning time-consuming, consistent with current literature. Considering most Traditional Lecture Learners were mature part-time students with family commitments, it would be likely that the flexibility and convenience of use of online learning were advantageous factors when balancing the demands of work, family, and university. Part-time students attend sessions three days a week and have work commitments for the remaining two days. If attendance days are the only time they have to complete their e-learning tasks, it is understandable if these are not beneficial factors. Even though Waight and Steward (2005) found the demand for flexibility of learning is high within higher education this was not the driving motivation for Traditional Lecture Learners. Berke and Wiseman (2003) found that while mature students excel because they are more focused and determined, juggling other responsibilities like child care, jobs and family obligations means they are time limited. They were concerned that while students are committed, combining study with all other responsibilities means they keep shifting time priorities to where they are needed and may depend on isolated independent learning because of this. While some mature students may depend on isolated learning it is clear that this group of learners value working in online groups and online social learning.

Flexibility and convenience of learning, in contrast to the above, was important to the Techno Learners. This is supported by Hall et al., (2004) who found that the majority of students agreed that e-learning was an effective medium for learning as most students were able to use the web from both work and home. Harley (2002) stated that an evaluation of courses with the development of online learning and materials showed that it increased convenience for students and allowed them to use the material flexibly and on their own terms. Marjanovic and Orlowska (2000), Yaneske and Bingham (2006) and Waight and Stewart (2005) believe that the increasingly diverse student population in the educational sector allows universities to opt for e-learning to provide flexible delivery of courses.

Traditional Lecture Learners wanted more face-to-face contact with tutors. Sharpe, Benfield, and Francis (2006) state that e-learning requires proactive and effective management of learning unlike traditional didactic lectures where the emphasis is on knowledge transfer rather than knowledge creation. The shift of responsibility for learning from tutor to student is difficult for some mature students as e-learning requires students to change their learning styles and preconceived ideas of what studying would be like or how teaching should be delivered. Beasley and Smythe (2004) speculate that due to

prior experience and expectations students continue to work in the method that is familiar to them. Entwistle and Ramsden (2002) state that while e-learning meets the needs of different learning styles it may require a change in learning style for some students. Sharpe, Benfield, and Francis (2006) also found that students respond differently to a change from traditional delivery, cope differently with the emotionality of the experience, and develop strategies differently for managing their time. Students who preferred more face-to-face contact may find self-direction more difficult, confirmed by Howatson (2004) who found that inexperienced learners experienced difficulty with self-direction and preferred direct tutor contact rather than the isolating experience of e-learning.

For those in the group that felt that it did not help the way they learned, perhaps the e-learning activity of the discussion board was not engaging enough. Perhaps the instructions or expectations were unclear (Cragg, Andrusysyn, & Humbert, 1999). Alternatively, students may need face-to-face interaction for learning some aspects of the course and to be able to clarify new concepts (Berke & Wiseman, 2003). Since this group agreed that e-learning did not allow sufficient face-to-face contact, in-depth discussion, or instant feedback, students may have found it difficult to confirm that their learning was sufficient or correct. The e-learning activity was finished before tutor feedback. For those students who are accustomed to the immediacy of response from the internet (e.g., downloading music, rather than going to the store or searching for information on the web, rather than going to the library), current structuring of e-learning tasks may not fulfill their expectations and may cause them some frustration. Sharpe and Benfield (2005) state that the provision of timely feedback and regular facilitation of tasks supports and motivates learners. This timing needs to be reconsidered consistent with Hall, Harvey, Meerabeau, and Muggleston's (2004) findings that online learning is effective when the tutor is in regular contact with students, progress is monitored, and monitoring leads to early intervention.

Contrary to researcher expectations, students who preferred traditional lectures have confidence in their computer skills. They disagreed that the technology was confusing and that e-learning enabled them to improve computer skills. Placement of the statement regarding competent computer skills may suggest that if Traditional Lecture Learners were more competent with computers, the feelings toward e-learning would be improved. Students' level of technical competency needs to be determined, as their skills may not handle e-learning requirements. Computer literacy may be a barrier to the levels of engagement in e-learning tasks.

Castle (2004) found that many mature students with less experience

might lack computer skills and confidence in the use of online materials or e-learning activities. Lack of computer skills, incorrect perceptions of workload, and inadequate preparation for online learning contribute greatly to poor learning experiences (Lytras et al., 2002). However, further exploration of students' perceptions of what they thought were competent technology skills is necessary to clarify this further. Students disagreed that e-learning activities "allowed for better access to resources" but also disagreed that "'the technology was confusing." While they seem to have the confidence to navigate through the e-learning activities, access to the discussion board may have been an issue as numerous studies (An, Kim, & Kim, 2008; Castle, 2004; Hughes & Daykin, 2002) comment on accessibility contributing to the students learning experience.

Students who prefer traditional lectures as a group demonstrated that "working in a group allowed me to learn from others," "allowed more cohesion," and "allowed building of friendships." Smith and Buckler (2005) similarly found that mature students in their study were often constructivists or socio-constructivist learners who create their own knowledge together with others instead of on their own. This group were positive about learning from each other which Ramsden (1992) explains could be because for learning to take place, students need to actively participate in problem-solving and critical thinking activities where they construct their own knowledge by testing ideas with others to answer questions. The shift from tutor-led discussion to student-led discussion meant that students were taking responsibility for their own learning.

The group who benefit from the use of technology were also positive about online group work and emphasised that working in a group allows students to learn from each other, helps the way they learn, and allows them to learn in depth. The beneficial effects of students interacting online have been widely reported by Gibbon (2005). Berke & Wiseman (2003) found that students enjoyed working in groups because it led to social cohesion, learning from each other, and an awareness of the group process.

An observation on the contributions of students on the discussion board showed that some students were more active than others, which may be related to the fact that students were required to work in groups rather than contribute individually. Stronger group members may have uploaded responses on behalf of the group, which makes it difficult to determine any individual contribution to the e-leaning activity. Brockbank, McGill, and Beech (2002) suggest that if learning is to take place, the situation needs to be well-structured by the tutor, as learners cannot remain passive. Harvey (2004) found that discussion boards are successful when students are asked to contribute individually, and

discussion is developed in stages as introduced by the tutor. The e-activity in the component studied here was introduced as a whole to the students by a tutor, contained nine threads for discussion, and may have been too demanding. Other factors related to the success of discussion boards are the attitude of the tutor, the tutor's rapport with the group, discussion that is explicitly linked with assessment, and anticipated learning outcomes (McLoughlin, 2002). Although discussion was linked with assessment, tutor involvement was not explored in this study.

## Further Steps

Two ideas were identified from this study to improve e-learning experiences for both the Traditional Lecture Learners and Techno Learners in the occupational therapy module. First, all students need timely feedback and interaction from tutors and second, there is a need to establish baseline technology skills of students before starting any e-learning tasks. Factor interpretation enabled identification of the feedback issue and has led to course modification for the new academic year. The improvements include the construction of new e-learning tasks which consist of well-paced activities and narratives broken down into sequences of activity. The new e-learning tasks will be introduced gradually with feedback on previous online interactions so that students can use the feedback on new tasks.

To implement the second recommendation, it is intended to determine first the baseline technology skills of students and what support mechanisms they need to use e-learning. As Conole (2004) recommends, a formal introduction to the new technology will be instituted, keeping in mind that that students have a wide range of previous experience and computer skills. All students will now receive an introductory session on to the use and navigation of the virtual learning environment.

Reflections on the use of Q methodology highlighted some of the limitations of this study. While Q methodology enabled both qualitative and quantitative enquiry, further clarification on placement of statements needs to be explored through follow-up interviews. van Exel, de Graaf, and Rietveld (2005) suggest that interviews allow exploration of complex and sensitive issues, such as levels of technological competence, perception of tutor facilitation, and theory experience of support and technology. These comments would enable a better understanding of the results and a more in-depth interpretation of factors. Hala, Elhoweris, and Alsheikh (2006) also suggest the generation of statements through the use of focus groups or other naturalistic sources to enable the perspectives of this group of students to be adequately represented.

Conducting the Q sorting online made possible access to a greater

number of students, as they had completed the components of the course at the time of data collection and moved back home for summer vacation. While de Graaf (2007) believes that the online option is less desirable as the process of Q sorting is complex and requires face-to-face interaction, explicit guidelines for Q sorting online proved successful as no problems were reported from the respondents.

## Conclusions

Findings from factor interpretation allowed the researcher to focus on specific issues for improvement in order to meet student needs. This in turn resulted in the individualizing and customizing of learning and teaching strategies as more technology input was required by some before engaging with e-learning tasks. Factor interpretation helped to identify that mature students were significantly similar in their perceptions. By understanding this group's complexity of juggling home, study, and work, it has been possible to create more time for e-activities with timely feedback.

A major benefit of Q methodology is the flexibility it offers in terms of research design. Findings allowed the assessment of patterns and issues relevant to this group of students, and thus were very useful for studying specific aspects of students' issues. The study allowed the exploration of practical questions like difficulty in accessing computers or learning achieved by working in a group. While Q methodology allowed the systematic investigation of students' points of view on e-learning, the researcher was aware that there was a danger that not all issues were reflected by the Q sample.

For a novice e-tutor, the use of Q methodology led to an appreciation and understanding of the specific issues that contribute to a student's perception of e-learning. Findings suggest that a blended approach would facilitate active student engagement. E-learning is a complex process with many factors contributing to the students' learning experience, but the findings highlighted clear recommendations and solutions needed for course development and improvement.

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## *Appendix: Statements and Factor Score*

| *No* | *Statement* | *Factor 1* | *Factor 2* |
|---|---|---|---|
| 1 | E-learning is flexible and allows me to study at any time. | –1 | 3 |
| 2 | I can study at a place that is convenient for me either at home or university. | 0 | 3 |
| 3 | E-learning helps the way I learn. | –2 | 2 |
| 4 | E-learning allows greater interaction with tutors. | –3 | 0 |
| 5 | Facilitates better communication in the group. | 1 | 1 |
| 6 | E-learning allows me to learn more in depth. | –1 | 2 |
| 7 | If there is more familiarity with the technology the outcome is better. | 1 | 0 |
| 8 | E-learning allows better access to resources. | –3 | 0 |
| 9 | E-learning enabled me to improve my computer skills. | –3 | 2 |
| 10 | Working in a group allowed me to learn from others. | 2 | 3 |
| 11 | I have more control of my learning. | 0 | 2 |
| 12 | E-learning allowed more cohesion in the group. | 2 | 1 |
| 13 | E-learning allowed me to build friendships. | 3 | 1 |
| 14 | I realised that I could not remain passive because I had to participate and contribute. | 0 | 1 |
| 15 | E-learning allows better understanding of the material. | –1 | 0 |
| 16 | E-learning allows me to work independently. | 0 | 1 |
| 17 | I found the technology confusing. | –2 | –2 |
| 18 | Access to computers is difficult and this affects my learning. | –2 | –3 |
| 19 | I am de-motivated because I do not have sufficient computer skills. | –2 | –3 |
| 20 | E-learning increases my workload. | 1 | –1 |
| 21 | E-learning is time consuming. | 2 | –1 |
| 22 | E-learning does not allow sufficient face to face contact. | 2 | 0 |
| 23 | I do not like my contributions to be exposed for public scrutiny. | –1 | –2 |
| 24 | E-learning does not allow for in depth discussion. | 1 | –2 |
| 25 | This type of learning does not allow for instant feedback. | 3 | –1 |

| *No* | *Statement* | *Factor 1* | *Factor 2* |
|---|---|---|---|
| 26 | I find self directed learning difficult. | 0 | -1 |
| 27 | This type of learning is an isolating experience. | 0 | -1 |
| 28 | E-learning does not allow interaction with other students. | -1 | -3 |
| 29 | I Prefer traditional lectures rather than e-learning. | 3 | 0 |
| 30 | E-learning does not complement the way I learn. | 1 | -2 |