University Lecturers as a Community of Learner: A Journey Between Technology and Pedagogy

Abstract

The use of online pedagogy within universities is increasing. However, this expansion is not accompanied by an associated an increase in investment in lecturers' pedagogy to assist them in the transition. At present, lecturers lack the tools to describe or illustrate the meaning they try to make of this transition between online pedagogy and technology. This paper describes the changing relationship between pedagogy and technology that a group of academic staff demonstrated in a one year Action Research project. From diagrams produced by the lecturers, it can be seen that there is a tension between the two continua of pedagogy and technology. This way of representing their views is presented as a tool for assisting lecturers to construct meaning as they continue to adopt technology in their online teaching while also providing a benchmark for their online pedagogy in order to ensure quality teaching in higher education.

The Gap Between Pedagogy and Technology

This paper focuses on the journey undertaken by a group of lecturers at a Western Australian university as they explored the relationship between their pedagogies and technology. It describes an attempt to overcome the gap between pedagogy and technology by identifying the disparity and reducing the gap. For optimum teaching purposes, the ultimate goal would seem to be to match one with the other. Social constructivism has been selected as a theoretical framework with the potential to provide a bridge between pedagogy and technology. Social constructivism is based on the notion that learners personally construct knowledge, and that learning continues to grow and develop because it is socially situated within a community of learners (O'Connor, 1998; Tobin, 1993; Von Glaserfield, 1990). Garrison and Anderson (2003) suggested that the value of e-learning is not in its faster access to information, but "in its capacity to facilitate communication and thinking and thereby construct meaning and knowledge" (p. 6). If this is accepted, then it is important for the e-learning lecturer to integrate the relevant technology and constructivist pedagogy.

Social constructivist pedagogy is congruent with the key elements considered necessary for successful e-learning to occur, namely affective support, interactive and collaborative experience, creation of a community of learners, peer learning, reflective discourse and student-centered learning (Maor, 2003; Jonassen, 2000; Duffy & Cunningham, 1996). However, in online learning there can be a tendency to focus on sharing and comparing information with less emphasis on negotiating meaning and applying newly constructed knowledge, which requires reflection (Hara, Bonk & Angeli, 2000; Hendriks & Maor, 2004).

In spite of the trend towards online teaching, many higher education faculty members are not yet using this technology and, if they are, they are unsure how to use it effectively (Conard, 2002). Therefore, this project attempted to engage higher education lecturers in constructing new meaning about the integration of pedagogy and technology in their online teaching by providing opportunities and an environment in which they were able to do so. This is congruent with the notion of constructive environments as being those in which people "can pursue personal projects, reflect on what they are doing, give form to their thoughts in a variety of ways, and 'compare notes' with others (i.e. different kinds of others, with different expectations and levels of understanding)" (Ackermann, 1995, p. 352).

The use and understanding of technology in teaching can be seen as a separate issue to that of teaching in itself and this is what can create a gap between pedagogy and technology. If the primary focus is pedagogy, and technology is just seen as another mode of delivery designed to enhance the teaching and

learning experience, then technology and pedagogy can be seen as existing separately with one having minimal impact on the other. However, if elements of technology and pedagogy can be seen as mutually supportive and interdependent, then it should be possible to construct new meaning about teaching online that is integrative and serves to bring about a bridging of the gap between pedagogy and technology. This paper presents the meanings constructed by several lecturers around pedagogy and technology, and how they integrated the two.

The Project

A group of university lecturers who were engaged with online teaching, formed a community of learners over a one year period for the purpose of examining and thereby improving their understanding and use of both social constructivist pedagogy and technology. For a full description of the research design and methodology, see Maor (in press). The following research questions were investigated:

1. How do lecturers develop their use and understanding of pedagogy?

2. How do lecturers develop their use and understanding of technology?

3. How did being part of a community of learners enhance their integration of pedagogy and technology?

The lecturers chose to take part in monthly workshops and online discussions while also teaching in their respective classes. This was under the guidance of the researcher, who is a lecturer in Education at the university, with experience and expertise in online teaching. Initially ten lecturers were involved in the project, each having different levels of experience and expertise with both pedagogy and technology. After twelve months six lecturers were still involved and of those, four were able to give diagrammatic form to their ideas about pedagogy and technology in a way that illustrated both a continuum of pedagogies and a continuum of competence in their use of technology (see Figures 1-5). These lecturers, two males and two females, were from the disciplines of Environmental Science, Law, Information Technology, and Education.

The workshops were designed to elaborate relevant practical and theoretical issues and to engage in problem solving strategies related to pedagogical issues. The presentations and discussions involved various aspects of online learning, including the principles of social constructivism, online learning and technology, collaborative learning, social learning and reflective discourse, Web CT tools, online assessment and action research methodology. The major pedagogical issues explored were participation, collaboration, interactivity and the role of the lecturer in the online environment (Maor and Zariski, 2003). The sessions, held for one and a half hours each were recorded and later transcribed. Online and offline discussions about theoretical and practical issues were also included in the project. In addition, pre and post questionnaires provided a variety of valuable information about the lecturers' experience with the technology and online teaching. The final data collection involved a reflective exercise in which the lecturers were asked to construct a diagram which was intended to provide visual evidence of changes in the way they perceived, used and improved upon their pedagogy and technology during this one year action research project.

An attempt was also made by the lecturers to develop a 'group' diagram of the pedagogy and technology continua. This diagram incorporated a number of different variables that gave meaning to the two continua and explained the relationship between them, since the lecturers highlighted this aspect as an important outcome of their involvement in the project.

Results

The data analysis used social constructivism as a framework, as this was seen as the most suitable theoretical vehicle for developing high quality interactive online learning environments where a community of learners is operating (Bonk & Dennen, 1999; Jonassen et al., 1995). As such, each diagram

demonstrated the lecturer's position in relation to pedagogy and technology, his/her connection between pedagogy and technology, and the changes that were experienced during the research project. The diagram comprised of two parallel continua, one representing pedagogy (the level of social constructivist approach) and the other technology (competency and understanding of the technology), and signified a tool that would enable the lecturers to make meaning of their participation in the project. These visual reflections are described in detail, along with other data collected from interviews, seminars and a final workshop that reviewed the process. The tension between the pedagogy and technology is also described and discussed.

Individual Data

In the final workshop the lecturers were asked to indicate on their diagram where they would position themselves in relation to technology and pedagogy. Each vertical line represented a continuum from low to high understanding and use of pedagogy and technology respectively. When the first lecturer (KN) started to draw the diagram, she identified the gap between her understanding and use in relation to both issues, therefore she drew separate lines and points representing use and understanding of pedagogy and technology. Other lecturers then followed her example. The following diagrams are replications of the drawings produced in the workshop and provide the data for analysis.

This diagram (Figure 1), drawn by lecturer (KN) shows that she perceived an increase in her understanding of both pedagogy and technology over the time frame of the research. She situated herself high initially on the pedagogy-axis (KN^1) to represent her understanding of pedagogy, which improved to the level of KN^2 during the project. The diagram also demonstrates an improvement in her understanding of technology (KN^1 to KN^2) but this is indicated on the lower end of the right vertical line. The two approaching curves between the continua signify an improvement in her use of technology and her attempt to integrate the two.
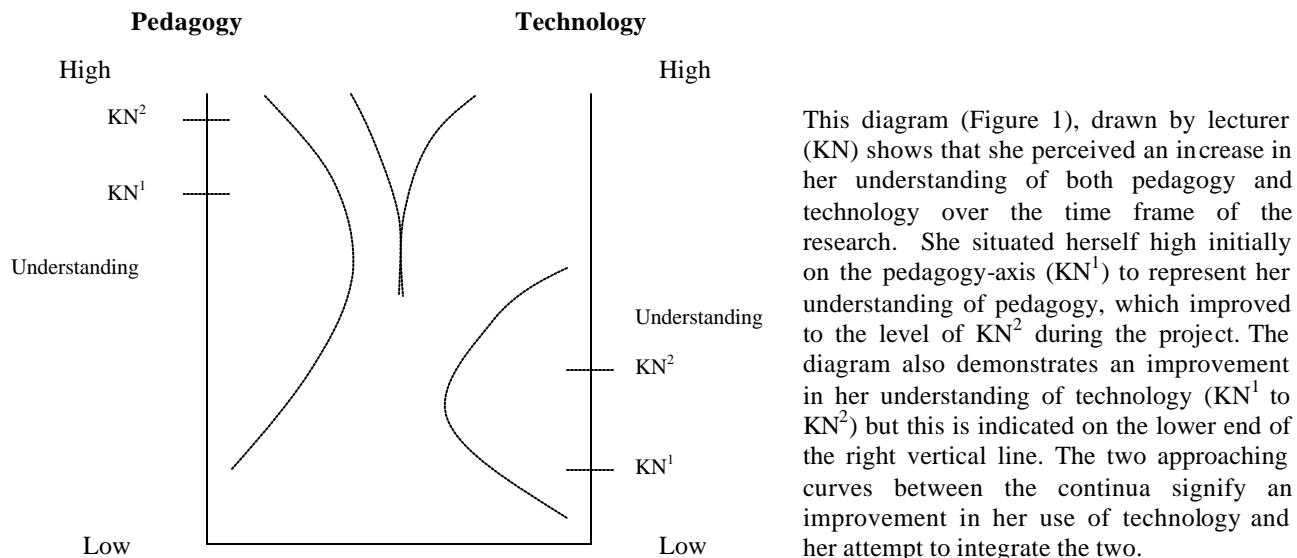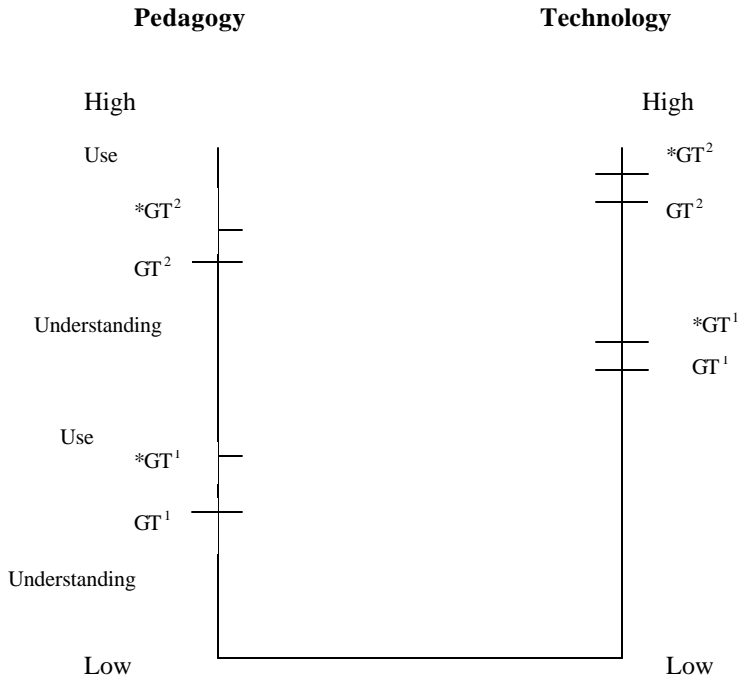
Figure 1. Approaching integration

The dotted curved lines (Figure 1) describe her perceived future possibilities in use of both pedagogy and technology. They indicate that she expects to improve her understanding of both pedagogy and technology and that the two will be more closely integrated. The label of the diagram reflects this.
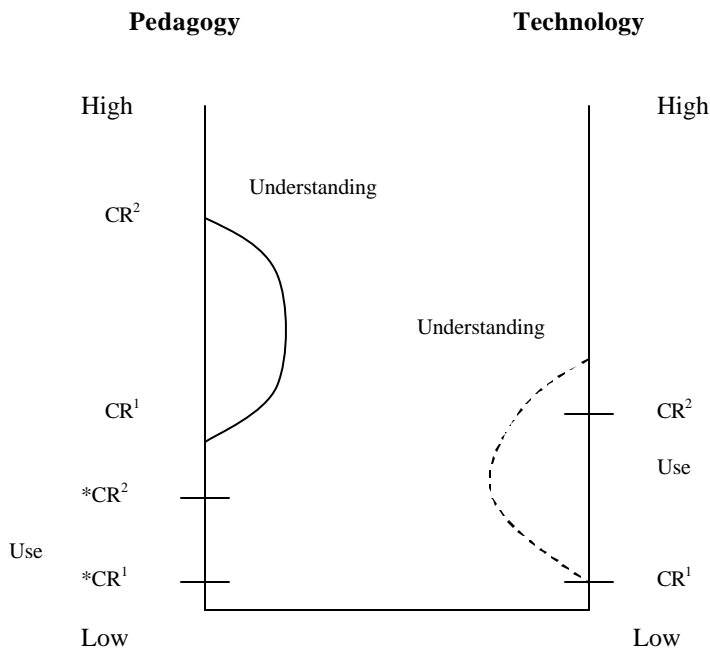
In the final workshop, (2002) KN stated that by the end of the project she "had changed very little on either, but my understanding of the two has greatly increased." However, the exercise had made her reflect on her teaching and discuss it with others within the community of learners. Her participation helped in her understanding and use of social constructivism in online learning, as these comments suggest; "it is useful talking with everybody and discussing some of the issues and problems. It helped to think back to assumptions of social constructivism and really get a handle on those reasons again and apply [them] to online" She further emphasized the value of the group; "it is good to know you're not the only one struggling with some of this stuff because you know it can be a very isolating experience trying to collaborate, and support is important in development" (KN, Final Workshop 2002).

Pedagogy   **Technology**

High   High

Use

$*GT^2$

GT^2

Understanding

Use

$*GT^1$

GT^1

Understanding

Low   Low

$*GT^2$

GT^2

$*GT^1$

GT^1

The diagram depicted in Figure 2 shows four points on the Pedagogy axis referring to the increase in level of use ($*GT^1$ and $*GT^2$) and understanding (GT^1 and GT^2) of social constructivist pedagogy by the lecturer (GT). A similar illustration exists on the technology axis. However, there was no attempt by this lecturer to illustrate the relationship between pedagogy and technology in this diagram, hence its label 'separate continua'. Interestingly, this lecturer was already very skilled in the use of online technology, but aimed to improve her use of online group work as part of the constructivist framework. She believed her use of both pedagogy and technology was higher than her understanding initially, but she reported that as a result of this project, she is now using both with more understanding.

Figure 2. Separate continua

Comments made by this lecturer in the reflective exerc ise suggest that she was already very familiar with technological aspects of online teaching, but participation in the project helped to improve and motivate her to continue, as she elaborated, "It helped me to keep on track and keep on target. Feedback and discussions helped clarify thoughts". Her belief that, "technology can isolate rather than bring people together unless social constructivist pedagogy is used" (GT, Workshop, March, 03), resulted in the development of an action research project in her online unit, using the same principles of online collaboration and reflection as this project.

Pedagogy   **Technology**

High   High

CR^2

Understanding

Understanding

CR^1

$*CR^2$

$*CR^1$

Use

Low   Low

CR^2

Use

CR^1

This diagram (Figure 3) illustrates changes in the use of pedagogy and technology. Specifically the diagram indicates a moderate increase in the use ($*CR^1$ and $*CR^2$) and a greater increase in the understanding of pedagogy, and a major increase in the use (CR^1 and CR^2) and understanding of technology. There is a movement towards integration (see label) of understanding of the two continua, illustrated by the curved lines between the axes.

Figure 3. Movement towards integration

This lecturer (CR) presented himself as the skeptical person within the group and it is interesting to note that initially he felt he had not implemented a constructivist approach to his teaching. He strongly believes in face to face teaching although he does see the future of teaching with e-learning. He appreciated the opportunity to work within a group of colleagues and suggested that the workshops opened him up to new ideas and caused a shift in his understanding (CR, Final Workshop, 2002).

Pedagogy   **Technology**
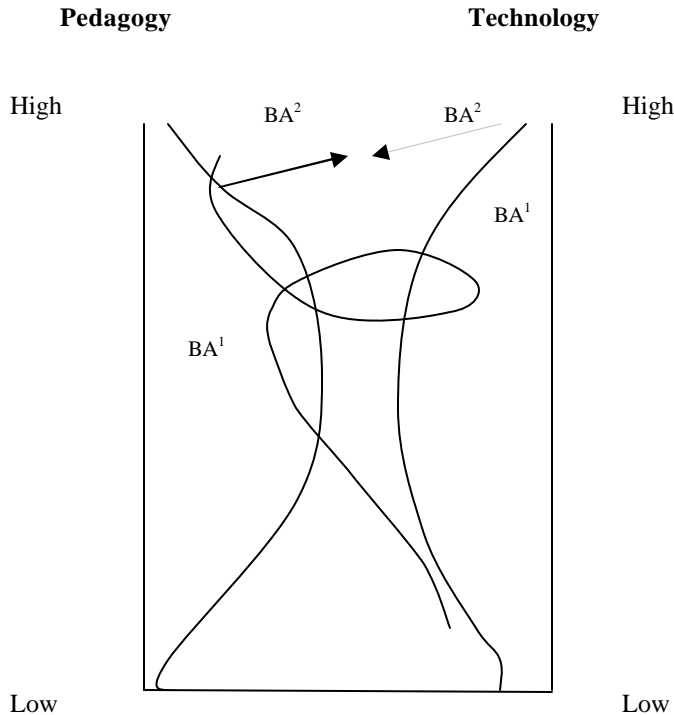
The diagram depicted in Figure 4 represents a very dynamic illustration of this lecturer's (BA) views. He did not differentiate between the use and understanding of either pedagogy or technology, using one curved line for each. These curved lines came closer together and then the interchange between them is illustrated by a new line that binds the two together. The arrows, BA^2 and BA^2 suggest an attempt to integrate the two components.

Figure 4. Dynamic representation

The high level of use of technology by this lecturer promoted the integration of the constructivist pedagogy into his teaching. According to him, the project "increased my use and application of social constructivism and I have moderately increased my use of technology. I was high to begin with, but I go back to pedagogical principles and see that they're not lost in online learning" (BA, Final Workshop, 2002). Furthermore, this project showed him that "technology presents certain opportunities and possibilities; it's a communication tool – publicly or privately – so even if you don't know it, the technology suggests something that actually ties it into constructivism". His explanation about his diagram suggested a dynamic "continuum of technology and pedagogy – people coming from either side, developing a dialogue, melding the continua." (BA, Final Workshop, 2002).

Group Map – Integration of Pedagogy and Technology

Based on the individual maps, a group representation diagram was constructed (below) that demonstrates the key elements in pedagogy, technology and (on the horizontal or X axis) the formation of a community of learners by the university lecturers through the processes of collaboration, participation and interaction. The diagram has integrated elements of meaning constructed by the lecturers during the process of self-reflection.

As with the individual diagrams the two vertical continua illustrate pedagogy on the left axis and technology on the right axis. However, during the workshops the lecturers clarified their use and understanding of the constructivist pedagogy with a number of elements including reflective practice, action research, role playing, information sharing, applying newly constructed information and negotiated

meaning through their discussions with the researcher. All of these elements are components which demonstrate constructivist pedagogy.

Pedagogy   **Technology**

Constructivist Approach

Action Research
                                                    Discussion Groups

Reflective Practice
                                                    Post boards

Information Sharing
                                                    Websites

Role play

Negotiating meaning

Applying newly
constructed information

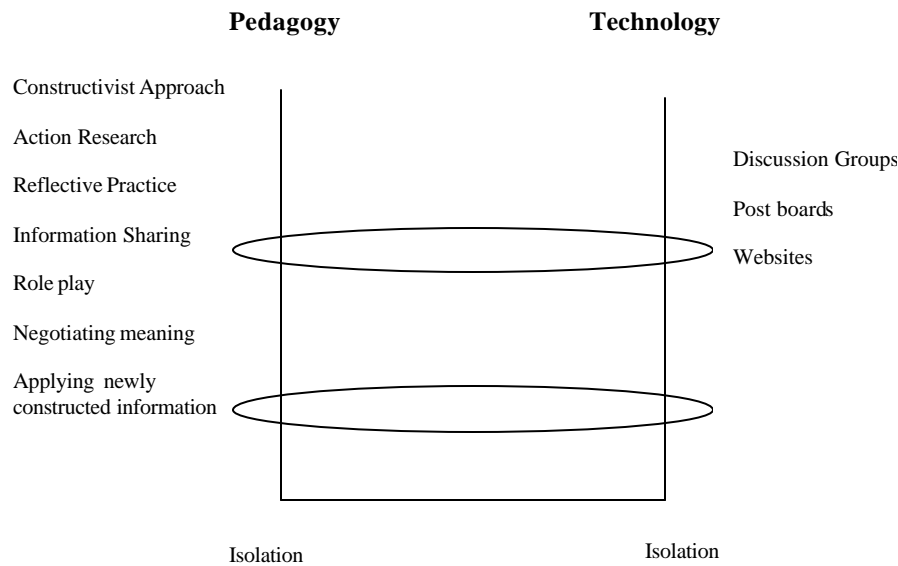Isolation   Isolation

Figure 5. Group representation

In isolation, each vertical continuum could be interpreted as being within a fairly static environment with little movement occurring in the use and understanding of either pedagogy or technology. So, the horizontal axis has been interpreted as representing the relationship between pedagogy and technology underpinned by a strong community of learners who engage in relationship building, dialogue, participation, collaboration and interaction that assist in the integration of both. It is suggested that the connection between pedagogy and technology through lecturers' participation in a community of learners creates a dynamic environment which has been represented on the group diagram by the baseline joining the two vertical continua.

The two ellipses on the diagram have been drawn to suggest that it is the match or fit between pedagogy and technology that is important, and that this match is assisted by the formation of a community of learners among the university lecturers. When the continua are not matched, as in the example of lecturers who were advanced in either their pedagogical experience or their technological competency, the task of integration was more challenging (Maor and Zariski, 2003). The question is whether the final diagram can be used as a benchmark to achieve a community of learners within e-learning environments in order to improve individual integration of pedagogy and technology.

Discussion

The formation of a community of learners for the purpose of researching pedagogy and technology within an e-learning environment enabled the examination of lecturers' changes in their use and understanding of pedagogy and technology and their interrelationships. The diagrams illustrated the impact of being part of a community of learners by encouraging integration through an increased use and understanding of pedagogy and technology. As each lecturer participated in the monthly workshops and online discussions, they were exposed to critical issues about implementing online teaching and to the ways in which

technology can best be utilized to suit their pedagogical needs. Consequently, these lecturers were able to assimilate the accumulated experience and understanding of the group in relation to pedagogy into their own teaching situation. The presence of the group added more to the overall impact of the project and tended towards moving the continua closer together.

Each lecturer included comments about the valuable experience of participating in the group. Two lecturers mentioned decreased isolation as a result of participating in collegial discourse, whilst a third found the support of the group invaluable. One lecturer noted the importance of dialogue in melding the continua, while using concepts such as collaboration, participation and interaction. Partly this was because these words had been used in the final interview questions as means of assessing the level of participation in the lecturers' own online courses. However, there was a strong theme of collaboration and support as being necessary components of online learning and in helping to construct meaning about pedagogy and technology.

Although this research project has demonstrated that the lecturers were ready to invest their time and participate in the face to face workshops to improve their pedagogy and technology and to listen to others with similar concerns in relation to online teaching, it was suggested that this would not be sustained unless there were regular injections of face-to-face dialogue, reflection and deliberation. It is the underpinning assumption of this paper that what makes both pedagogy and technology function effectively is the dynamic relationship between the two continua. To link both pedagogy and technology we need relationship and interaction (Maor and Zariski, 2003).

One characteristic of online learning is the large amount of information that can be accessed by people who have the ability and tools to do so. But education and learning is not just about information. Synthesis of meaning from large bodies of knowledge demands collaboration (King, 1998) and integration; it is a process contained within social constructivist learning theory. However, this does not always happen. Synthesis of the pedagogy and technology continua means reducing the gap between them and perhaps even integrating them into one. One lecturer, for example, showed the maximum amount of integration during this project perhaps because he already had high levels of use and understanding of both pedagogy and technology. Therefore, by maximizing the opportunities for dialogue within a community of learners, the quality of teaching in e-learning may be raised.

An added benefit may also be a reduction in the isolated experience of lecturers being left to their own devices to work through the masses of emails, Web CT, discussion boards, etc. Harasim, Hiltz, Teles and Turoff (1995) support these views when they state that the concept of education 'is changing from one based on individualism and competition (with collaboration and exchange among students viewed as disruptive or cheating), to one in which teamwork and networking are valued, mirroring changes in society and the workforce.' They add that the fundamental characteristic of network learning is the premise of collaborative approaches to learning (Harasim et al. 1995). Therefore, if at all possible, any e-learning must be supported and should benefit from face-to-face contact and community building among the participants. Various electronic tools and techniques such as scaffolding have been suggested as ways of developing such a community. (King, 1998; Oliver & Herrington, 2001).

Conclusion

There is a tension between pedagogy and technology which is created by a lack of ability to use constructivist pedagogies to teach online or lack of technological capabilities to implement the pedagogies that match the learning objectives. This paper suggests that attention needs to be paid to the integration of both pedagogy and technology.

It is the recommendation of this researcher that reflections on the integration of pedagogy and technology take place within a community of learners where opportunities are provided to construct meaning about this process using the group diagram shown above. In this way, lecturers will be able to identify and locate themselves on the continua, while using the diagram to inspire themselves to adopt other ways of implementing pedagogy along with selecting the appropriate pedagogy fit with their technology. It must be

acknowledged that the approach presented in this paper represents a new development in examining this important area, and as such, needs to be further explored and discussed among the research community and practitioners of online teaching in higher education.

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