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This special issue contains articles submitted as part of the 2013 Orlando, Florida Conference. It covers topics related to teaching, learning and research from a range of academic disciplines, with contributions from scholars across the world.

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The 2013 HETL Conference held at the University of Central Florida in Orlando, Florida, USA covered the theme **Learning Spaces**. Articles in this volume focus on learning spaces of all types in higher education and how to better engage students and improve teaching and learning. All submissions to the special conference issue were reviewed following a double blind review process. The acceptance rate was 25%.

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Guest Editors' Notes

Welcome to this special 2013 conference edition of the International Higher Education Teaching and Learning Review (IHR). The conference papers presented here were selected after double blind peer review from a significant number of manuscripts from colleagues in higher education institutions in many different countries. This special edition of the IHR is both a reflection of the success of the Higher Education Teaching and Learning Association (HETL) as a global organization and a timely reflection on the changes taking place in higher education around the world. It is clear there is an ongoing and growing level of engagement in the scholarship of teaching and learning across disciplines in our universities. The articles published in this special edition also reflect major themes that are emerging in relation to the generational shifts in learning and the impact of technology on previously well-established learning paradigms.

Betsy Duke and colleagues Ginger Harper and Mark Johnston from Kaplan University in the USA present an interesting paper on connectivism as a digital age learning theory. Not only do these authors provide an interesting narrative on pedagogical shifts over the past few decades, they also provide a convincing argument to support the view that connectivism should be seen as a 21st century theory of learning and that further research in this field is warranted. They build their argument on the work of Stephen Downes who presented the thesis that knowledge is distributed across a network of connections and that learning is the ability to traverse these networks. In an increasingly digital age, this paradigm shift is an important signal regarding new ways of learning. This idea is further affirmed by the interesting article by Satu Loujus and Olli Vilkki from Laurea University of Applied Science in Finland. This article on the Living Lab gives insights into students working with consumers and interacting with businesses and using multi-disciplinary knowledge and understanding in research and development projects.

Edward Baum's paper is a good example of embedding technology into teaching and developing a blended chemistry classroom for non-science majors. He has developed what he terms a process-oriented guided inquiry approach to learning, or POGIL. The class is a blend of face-to-face and online learning. In this paper as well as others in this edition, what is coming across is the notion of sustainable changes to learning and teaching, engaging students in the learning process and thereby empowering the learners.

Another strong theme coming through is the importance of language and how we teach language in increasingly diverse learner populations. Cynthia Hutchinson, Carine Strebel, and Joyce W. Nutta address the issue of beliefs and knowledge about English language learning. They present the different schools of thought on this but clearly signal a move to blend classes for English for Speakers of Other Languages (ESOL) with non-ESOL classes. Their paper outlines a novel classroom experience of active participation in an exercise to explain in a language other than English how to carry out a simple domestic task. It is a good example of putting yourself in the learner's shoes.

Staying with the theme of languages and learning, Alla Kourova and Doan Modianos from the University of Central Florida (UCF) who are engaged in the field of Teaching of English to Speakers of Other Languages (TESOL), give interesting insights into the development of inter-cultural awareness and its role in enriching students' communicative competencies. The premise

of the article is that language and its learning must be viewed within a socio-cultural context. Bringing a framework for inter-cultural competence into the classroom is a challenging task—the authors outline a project entitled Connecting Classrooms which involves students at UCF engaging in meaningful communication with students in a university setting in Russia.

In an article on creating spaces in health education, Marie Huff and Laura Cruz describe an opportunity to design a learning environment aligned with 21st century learning paradigms. The importance of buildings as settings for learning, and the integration of technology in the design of new buildings, is now seen as mission critical. Architects working with facilitators of learning is still a new concept but one that is emphasized as important in achieving learning outcomes for the current generation of students. Key theoretical connections between space and learning are considered in the design and development of new learning spaces with the aim of fostering student engagement, attendance and constructive interaction.

Health education features strongly in the next paper also. Roberts examines health-care education from a different perspective, a glass half full rather than a glass half empty view. His research around Appreciative Inquiry (AI) in a problem-based learning approach has provided insights into the narrow focus on health-care education as a clinical detached problem-solving model. His article reveals that this approach ignores to a large extent what the patient still finds positive about their situation and building on that platform rather than finding a fix for what is defective and seeing success only as a return to the previous state of affairs. He argues for a more philosophical view of health care so that future practitioners see their patients as people and not machines to be repaired.

What comes across strongly from these papers is the idea of internationalization of the curriculum, diversity of student populations, the socio-cultural contexts of learning, the humanity of our teaching practices. This special edition of conference papers shows clearly the passion with which educators approach their profession as well as the challenges that they face to provide the highest standards of education to students across the globe. This is the common thread that links all of our authors to their international colleagues and to the objectives of the Higher Education Teaching and Learning Association (HETL). There are lessons here for educators struggling in small scale learning settings and for those who are connected via technology to their constituents around the world. We commend these papers to you and are sure that you will find them rewarding and enriching.

Lorraine Stefani
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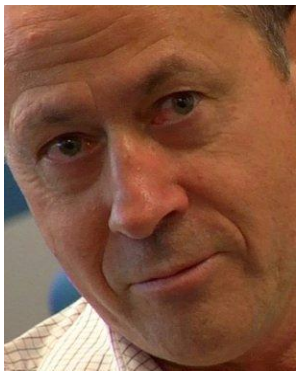

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Connectivism as a Digital Age Learning Theory

Betsy Duke, Ginger Harper, and Mark Johnston

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Abstract

George Siemens and Stephen Downes developed a theory for the digital age, called connectivism, denouncing boundaries of behaviorism, cognitivism, and constructivism. Their proposed learning theory has issued a debate over whether it is a learning theory or instructional theory or merely a pedagogical view. While the theory presented is important and valid, is it a tool to be used in the learning process for instruction or curriculum rather than a standalone learning theory? It has forced educators to look at what is being done in digital education and rethink, debate, and philosophize over how each part fits. Continually evaluating how each new generation learns with regard to instruction and curriculum serves to hold education to high standards. Certainly this theory is worth our thorough consideration.

Keywords: Connectivism, learning theory, instructional theory, digital age.

Learning Theories vs. Instructional Theories

George Siemens and Stephen Downes (Siemans & Downes, 2009) developed a theory for the digital age, called connectivism - denouncing boundaries of behaviorism, cognitivism, and constructivism. Their proposed learning theory has issued a debate over whether it is a learning theory or instructional theory or merely a pedagogical view.

What are the essential criteria for something to be a learning theory? A theory generally applies to the synthesis of a large body of information. The criterion of a theory is not whether it is true or untrue, but rather whether it is useful or not useful for explaining or predicting behavior. A theory is useful even though the ultimate causes of the phenomenon it encompasses are unknown. A theory can be refined, or with new information, it can take on a new direction.

If thoroughly tested, a theory may be widely accepted for a long period of time but later disproved (Dorin, Demmin, & Gabel, 1990). A useful theory of learning must have resulted from considerable testing and observation. In the evaluation of the quality of a theory, one must consider several other criterion points as well. The criterion of falsiability, developed by Sir Karl Popper, required that a researcher carefully examine any negative evidence that proves their conclusions untrue (Ertmer & Newby, 1993). Additionally, a rule of parsimony is the preference of simple theories over highly complex ones (Johnson & Christensen, 2004).

An instructional theory, on the other hand, must prescribe procedures to enable learning efficiently and effectively. According to Bruner (1966) an instructional theory should deal with

four major elements: (1) the learning predisposition, (2) the design of concepts to be presented and its structure for ease of understanding, (3) the most successful progression of ideas in which to present a body of knowledge, and (4) the administration of rewards and punishments. Therefore, an instructional theory focuses on the overall structure of learning material for the most successful learning experience. As a result of Bloom's *Taxonomy of Education Objectives* from 1956 (Bloom, 1984), instructional theory enabled the educator to code the learning process. This spawned a series of instructional theorists such as Robert Gagne, who published *Conditions of Learning* for the Florida State University's Department of Educational Research (Gagne & Medsker, 1996).

From the late 1970s, instructional theory has been traditionally split into two categories: behaviorism and cognitivism. Skinner's (Black, 1995) behaviorist theories were popular, because they could be evaluated using the new categorization kind of process, whereas it was more difficult to demonstrate a cognitive learning result. In opposition, Paulo Freire's *Pedagogy of the Oppressed* (2007) criticized the idea of an educational model being "banked". Much like Bruner's definition of instructional theory, Schott & Driscoll (1997) formulated a proposal for a universal instructional theory. Four components for an instructor and designer to consider were: (1) the learner, (2) the learning task, which includes learning outcome goals, (3) the conditions and instructional methods for learning, the overall environment, and (4) a frame of reference for specific learning. *"Therefore, the purpose of instructional theory is to be prescriptive, to provide principles by which teachers and instructional designers can assure learning"* (Driscoll, 2000, p. 353).

Gagne more clearly defined instructional theory during World War II for the process of training pilots in the Air Force (Gagne & Medsker, 1996). He later developed a sequence of requirements that codify what educators should use for instruction. Gagne is considered to be the foremost researcher and contributor to the organized approach to instructional theory. His major input to the theory of instruction was his model for "Nine Events of Instruction" from his book, *The Conditions of Learning: Training Applications* in 1996:

1. Gaining attention
2. Informing learners of the objective
3. Stimulating recall of prior learning
4. Presenting the content
5. Providing learning guidance
6. Eliciting performance
7. Providing feedback
8. Assessing performance
9. Enhancing retention and transfer.

Robert Gagne is regarded as the leading researcher to a methodical approach to instructional design and teaching. Since the focus is on behaviors as the outcomes that result from specific training, his followers are regarded as behaviorists (Gagne & Medsker, 1996).

What might not have been clearly obvious is that learning theory differs from instructional theory in that learning theories describe how learning essentially occurs, while instructional

theories explain how to achieve the preferred learning outcomes. One may reflect on the idea that cognitive theory is the leading theory in instructional design and many of the instructional strategies promoted and used by behaviorists are also used by cognitivists, but for a different purpose. For example, behaviorists evaluate a learner to assess prior knowledge, while cognitivists evaluate a learner to establish their predisposition to learning (Ertmer & Newby, 1993). Therefore, instructional design can be viewed from a behaviorist or cognitivist approach instead of the constructivist approach. Designing instruction by using a behaviorist or cognitive approach requires the educator to analyze the situation and then set specific goals. These goals are broken down into learning objectives and are further broken down into individual tasks. Assessment is based on whether specific criteria for each objective have been met. Instructional designer defines what the learner should know. Evaluation could be based on tests for mastery learning.

The constructivist approach, on the other hand, requires that the instructional designer produce a result that is more facilitative than specific. Knowledge gained is not pre-specified for the learner and evaluation is more subjective, since it does not rely on specific quantitative criteria. Results are obtained from the process and self-evaluation of the learner instead. Evaluation could be based on notes, projects, or journals. Because the learner can understand numerous realities, the learner is better able to deal with real life circumstances. If a learner can problem solve, he or she may be better able to apply existing knowledge to a new situation. A learning theory tries to classify what is known about learning. It has two central values for the researcher or instructor. Learning theories provide a conceptual framework and vocabulary to enable observations to be interpreted and understood. By using this commonality, those involved in the learning process can effectively explain what is observed and build or develop new ways to provide more meaning. Second, a learning theory provides a resource for the educator to solve a practical problem with a practical solution (Merriam & Caffarella, 1991).

Connectivism

Stated simply, connectivism is social learning that is networked. Stephen Downes described it as: *"… the thesis that knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks"* (Downes, 2007, para. 1). Connectivism is characterized as a reflection of our society that is changing rapidly. Society is more complex, connected socially, global, and mediated by increasing advancements in technology. It is the orchestration of a complex disarray of ideas, networked to form specific information sets. Ways of knowing are derived from a diversity of opinions. The individual does not have control; rather it is a collaboration of current ideas as seen from a present reality. The core skill is the ability to see connections between information sources and to maintain that connection to facilitate continual learning. Decisions are supported by rapidly altering fundamentals as new information is quickly integrated to create a new climate of thinking. This constant update and shift of knowledge also can be contained outside the learner, such as in a database or other specialized information source. For the learner to be connected to this outside knowledge is more important than his or her existing state of knowing. The first point of connectivism is the individual. Personal knowledge consists of a system of networks, which supplies an organization, which in turn gives back to the system. The individual continues the cycle of knowledge growth by his or her access back into the system. The advantage is that the

learner can remain current on any topic through the connections they have created. Within any defined social network, there is a focus for groups of people with a common goal. They can promote and sustain a well-organized flow of knowledge (Siemens, 2004).

Siemens stated that: *"Exponentially developing knowledge and complexification of society requires nonlinear models of learning (process) and knowing (state). We cannot sustain ourselves as learning/knowing beings in the current climate with our current approaches"* (Siemens, 2009, p. 3). With increasing technological connection through the Internet, digital cities that collaborate on a wide array of topics have become a collective network that links communities both locally and globally. This paradigm shift and proliferation of social networks have caused educators to embrace this new option for knowledge for use in the classroom. From his viewpoint, Siemens (2006) pointed out that knowledge has changed from categories and hierarchies to networks and various ecologies. Knowledge is based on the two ideas that it explains some part of our existence, and that the knowledge is useful for some kind of action. *"Viewing learning and knowledge as network phenomena alters much of how we have experienced knowledge in the last century"* (Siemens, 2004, p. vii). Concepts can be viewed much like a mind map, as a network, rather than as a linear progression of ideas. He asserts that this networking is the manner that an individual receives learning. Therefore, with such a dramatic change that is continually developing through technology, its institutions and schools are all *"stretching under the heavy burden of change. New epistemological and ontological theories are being formed…"* (Siemens, 2006, p. 3).

Connectivism as a Learning Theory

Connectivism could be a learning theory for the following reasons. First, connectivism is characterized as the enhancement of how a student learns with the knowledge and perception gained through the addition of a personal network (Siemens, 2004). It is only through these personal networks that the learner can acquire the viewpoint and diversity of opinion to learn to make critical decisions. Since it is impossible to experience everything, the learner can share and learn through collaboration. Second, the sheer amount of data available makes it impossible for a learner to know all that is needed to critically examine specific situations. Being able to tap into huge databases of knowledge in an instant empowers a learner to seek further knowledge. Such a capacity to acquire knowledge can facilitate research and assist in interpreting patterns. Third, explaining learning by means of traditional learning theories is severely limited by the rapid change brought about by technology. Connectivism is defined as actionable knowledge, where an understanding of where to find knowledge may be more important than answering how or what that knowledge encompasses.

Opposing viewpoints pose reasons why connectivism might not be considered a learning theory. First, while connectivism is an intriguing development for discussion, it is not a totally new educational approach to learning. Rather, when compared to established learning theories, there is an overlap of ideas. Skinner considered having a specific boundary as crucial for unique learning theory (Saettler, 1990). McMahon (1997) stated that learning can be defined within the boundaries of the three broad theoretical approaches: behaviorism, cognitivism, or constructivism (McMahon, 1997, para. 6-7). The Internet functions in a manner similar to the way person thinks (Gygi, 1990), which implies opportunities to link information required for

processing within a cognitive framework. Specifically, Piaget (1977) defined cognitive constructionism as learning with a process of accommodation, assimilation, and equilibration. Cognitive Constructionism is a *"dialectic process in which the subject resolves perturbations in the coherence of his or her structuring activities by coordinating and constructing new, more adequate cognitive structures"* (Saxe, 1991). Cognitive flexibility theory (Spiro, 1991), as explained by Archee and Duin (1995), is another corresponding theory. This theory pulls together multiple elements of content, where knowledge is interconnected and complex (Archee & Duin, 1995).

Second, connectivism *"misrepresents the current state of established alternative learning theories such as constructivism, behaviorism and cognitivism, so this basis for a new theory is also dubious"* (Kerr, 2006, para. 5-7). Additionally, Verhagen (2006) stated that connectivism is a pedagogical view instead. He asserted that learning theories should address the issue of how to enable the learner at the instructional level. By contrast, connectivism is directed to the examination of what is learned and why at the curriculum level. If connectivism is considered a learning theory instead of a theory of just being connected, there should be a provision for the transference and promotion of the learner's understanding. In agreement with this viewpoint, Kerr (2006) argued that the idea of connectivism as a theory is not valid. His debate with Stephen Downes occurs repeatedly in Internet discussions. Kerr considered connectivism to be part of existing learning theories, where various technologies only affect methods of instruction in numerous ways (Downes, 2007).

Third, while connectivism might apply to selected areas of knowledge, it would not be universal for all subjects. Knowledge cannot only be derived on a system that is available 24/7. Specific instructor connection and teaching or mentoring must take place for a learner to internalize concepts and apply them to their real world circumstance. While having a current data source handy at all times is helpful and at times, necessary, certain hubs of knowledge must be actualized by the learner. For example, a hospital patient would not be happy to see his or her doctor consulting his iPod for a diagnosis. Even though having the latest in research available is a requisite for the best medical treatment, it is no substitute for experience and personal knowledge from the doctor.

Connectivism and the Use of Technology

Rather than a new learning theory, connectivism offers an educator a model or mental representation that depicts something that cannot be observed or experienced directly (Dorin, Demmin, & Gabel, 1990). While the debate over the status of George Siemens and Stephen Downes' theory of connectivism will continue to be debated for many years, it is undoubtedly an important school of thought directly applicable to the use of technology in the classroom today. There is no doubt that online learning is a direct technological response to different learning cultures, methods, and inspirations. The combination of 3D interactive graphics and web technologies (Web3D) will permit instructors to create an interactive, realistic environment for the student in an online environment *(*Chittaro & Ranon, 2007*).*

The established learning theories of behaviorism, cognitivism, and constructivism each contribute in unique ways to the design of online materials through their ideas of how learning

takes place: Behaviorist strategies teach facts and what is needed for understanding concepts, cognitive strategies focus on how the process should be implemented for the most successful learning, constructivist strategies use a shift toward real-life application, where the learner is given the opportunity to construct personal meanings from what is presented. Connectivism can be used as an important instructional guide or theory to develop previous learning theories for their application to a globalized and networked world, but not as a standalone learning theory (Ally, 2007).

Within the framework of cognitive constructionism, Jean Piaget defined two principles for learning. First, learning is presented actively, and second, learning must be authentic and connected to real life (Piaget, 1977). Connectivism supports this definition by offering specific technological opportunities for the learner to be actively involved in the presentation of a body of knowledge. Students are able to recognize and interpret patterns by connecting to a diversity of representative networks. Furthermore, they are able to personally acclimate within a social network that encompasses experts from specific bodies of knowledge.

For example, with the aid of multimedia, a student can experience a computer based environment on Mars, while still being supported by their larger classroom setting. With constructivist factors that influence learning, such as engagement, participation, social, or cultural issues, the student can also build their own society or culture there, allowing networking opportunities to assist the critical analysis of this new world. Factors associated with prior knowledge of how life is supported and adapted to the elements and patterns seen in this new world show how being immersed into a new situation through the computer can make the learning personal and meaningful.

Summary and Conclusion

Technology influences all theoretical viewpoints by providing techniques and unique instructional methods. Every new idea or theory presented merits close examination for the possibility of helping students learn more successfully. With such a diverse population, an equally diverse selection of instructional techniques is necessary. Connectivism offers that diversity through a variety of networks, helping the new generations collaborate to find solutions to an ever increasing number of questions.

Dede (2007) mentioned how the nature of collaboration has changed. Throughout the years, educators and technologist had to learn to incorporate these changes in order to maximize learning. Engaged learning relies on collaboration among the members of the learning community (Conrad & Donaldson, 2004). These connectivist socializations help the learner structure (cognitivism) and create meaning from what is observed (constructivism), thereby establishing recognizable patterns to use in future situations (connectivism). Although Siemens (2005) argues for the shortcomings of existing learning theories, the continued rapid advancement of new technologies and associated ideas will continually transform instructional methods and expectations for acquiring knowledge.

To conclude, there is always a certain amount of core knowledge that is required to be able to understand any information presented. Depending on the field of study, this core knowledge will vary. If a person with limited core knowledge accesses Internet information beyond his or her ability to understand, then that knowledge is useless. In other words a structured study using the

existing learning theories is required in order to acquire the core knowledge for a specific field. While the theory presented by George Siemens and Stephen Downes is important and valid, it is a tool to be used in the learning process for instruction or curriculum rather than a standalone learning theory. It has also forced educators to look at what is being done in digital education and rethink, debate, and philosophize over how each part fits. Continually evaluating how each new generation learns with regard to instruction and curriculum serves to hold education to high standards.

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Living Lab Activities as the Starting Point for Developing ICT Studies in Higher Education

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Abstract

In order to respond to the challenges posed by rapid technological development, new competence and operating models are required in the design of information and communication technology (ICT). This, on the other hand, requires developing the content and methods of education in the field. This paper describes an experiment which aims to develop education in Business Information Technology studies at Laurea University of Applied Sciences (UAS).
The educational starting point for the development work was to produce novel competence in interaction design in the Business Information Technology degree program at Laurea and in the field of human-computer interaction (HCI). As a result of the development work, a pedagogical model uniform with a UCD process has been created. The aim of the pedagogical model was to provide ICT students with the capability to act as developers in a UCD process. The developed study module forms "*a dual innovation model"* comprising the continuous development of research methods through "*a test bed environment*", and the application of developed knowledge in Laurea's research and development (R&D) projects. The dual innovation model has been utilized in diverse R&D projects in the Living Labs Network activities of Laurea UAS. It has also been adopted as a pedagogical model in the Business Information Technology degree programme.

Keywords

Living lab, user centered design, participatory design, business information technology, higher education

Introduction

New technology is interactive and intelligent. Individuals in today's society must be able to daily deal with diverse information and communication technology devices and applications, which may appear complex and difficult from the user's point of view. Traditional designer-centered approaches to design cannot resolve the challenges faced in the development of modern interactive technologies. For interaction design professionals, understanding the complexities of human-technology interaction is not enough; what is also needed is the ability to internalize the priority nature of the user perspective in interaction design and understand the possibilities of user participation in the innovation process. (Luojus & Vilkki, 2008). Issues related to users or

the product's use, which may seem simple at first, might turn out to be crucial in terms of product design (Hyysalo, 2006).

User-centered design (UCD) is an increasingly common model for the product and service design innovation process. The three main principles of user-centered design are: (1) drawing attention to users and purposes right at the beginning of the design process; (2) empirical usability measurements, and (3) iterative design (Gaver, Boucher, Pennington, & Walker, 2004). UCD is beginning to focus increasingly on observing emotions and aesthetics alongside cognitive and functional factors, which has required development of the process. An issue revealed by user data that seems simple may turn out to be crucial in terms of the product's use. Acquiring data on end users is one of the key skills in product development (Hyysalo, 2006). Particular attention is paid to planning the user experience in relation to the product or service. We develop methods, tools and techniques for gathering information on the user experience (UX), usability and suitability of ICT technology products or services for their usage context.

The everyday life context of an end user, which, through different research settings and methods, has been made the object of information gathering for a UCD process, has recently been termed 'Living Lab' (LL) (Luojus, 2008). Literature approaches the Living Lab concept from diverse perspectives. It is referred to as a set of methods (e.g., Eriksson, Niitamo, Kulkki, & Hribernik, 2006; Niitamo, Kulkki, Eriksson, & Hribernik, 2006), an approach (Ståhlbröst, 2008; Schaffers, Cordoba, Hongisto, Kallai, Merz, & van Rensburg, 2007; Ballon, Pierson, & Delaere, 2005), but also as an environment, ecosystem and system.

Without a consistent description of the Living Lab concept and operating model, it is difficult to reach a coherent definition. The Living Lab concept's creator William Mitchell proposed that UCD research methods can be utilized in everyday life context of end users, for sensing, prototyping, validating and refining complex design solutions, *"which are increasingly necessary in our evolving living environments"* (Eriksson et al., 2006). According to many approaches, Living Lab is seen as an "*open innovation platform*", which offers RD&I services in a "*real-life context*". Many researchers share the view that the research methods of user-centered design are applied in Living Lab research and development activities. The innovativeness of the Living Lab approach is generally seen as being grounded on a mutually enriching dialogue that takes place in this open environment between different actors, such as end users, researchers, businesses and public bodies.

In this article, we describe an experiment aimed at formulating an educational programme that equips students to function as professionals and innovative developers in the changing operating environment of their fields by using the user-centered design process in their work and by applying appropriate research and development methods. We also examine the preconditions for the further development of research methods as well as the advancement of competence development in the context of the research and development activities of business partners, partner networks and the Living Lab ecosystem.

Living Lab Activities: User-centered design

User-centered studies in the field of human-computer interaction (HCI) favor qualitative methods, because research data compiled by these methods provide stimuli that allow ideas and insights to be created and opportunities to share them (Mattelmäki, 2006). Hanington (2003) divides UCD methods according to their objectives and results into three categories: (1) traditional methods are typically quantitative methods, such as market analysis, inquiries, surveys, interviews or focus groups. The data gathered by traditional quantitative methods provides an extensive view of the field of the design, but it does not fulfill the needs of the UCD process for interactive technology products, because generalizations fail to define individual and exceptional properties (Hanington, 2003; Gaver et al., 2004); (2) applied methods refer to the adoption of well-established research methods from different disciplines in UCD. These methods are usually qualitative methods of ethnography, sociology and culture studies, including self-documentation, observation and interaction methods, such as heuristic evaluations or thinking aloud. However, the objectives of design research depart from the humanistic tradition; applied methods are used for understanding the end users, the usage and the use contexts of technology; and (3) innovative methods are mostly suitable at the beginning of the design process, because they are used to increase an understanding of users' needs, emotions, values, dreams, and feelings of pleasure (Hanington, 2003). Designers should strive to understand and to interpret personal, social and cultural characteristics of end users as broadly as possible, because their design solutions will be evaluated and assessed in relation to them (Mattelmäki, 2006).

Traditional methods are appropriate for examining large masses of people, whereas innovative methods can be used to achieve more in-depth results when examining individuals and small groups (Hanington, 2003). The most important thing in planning user research and choosing research methods is that the information gathering supports the main objectives of the design process. Another essential aspect is to plan how the acquired information can be interpreted, used, shared and modified in the future (Hanington, 2003; Hyysalo, 2006). The use of a relevantly chosen method is cost-effective (efficient output/input ratio) and able to:

- Support the user's position and impact (from an object to a subject);
- Motivate and inspire user participation;
- Describe the user's everyday context, a genuine user context, user experience and environment, uncover the user's hidden needs and emotions (life in genuine contexts);
- Make tacit knowledge and weak signals visible;
- Concretize and analyze user study results, and inspire product and service development;
- Discover available potential to find new product and service innovations;
- Promote creativity and innovativeness.

Sleeswijk, Visser, Stappers, van der Lugt and Sanders (2005) divide user research methods into three categories according to the focus of the method: say/think, do/use and know/feel/dream. '*Say/think*' relates to interviews and to explicit knowledge, whereas '*Do/use*' relate to observation of use situation. '*Know/feel/dream*' refers to physical or visual aids to allow people to visualize and describe their expectations and dreams, or tacit knowledge (Sleeswijk et al., 2005).

According to this distinction proposed by Hanington (2003) and Sleeswijk et al. (2005), the most innovative or in-depth methods are creative and participatory. These methods are intended to understand people's feelings, emotions, values and dreams:

> "*Sometimes the objectives are thoughts never really thought, let alone expressed in words. These questions require tools to help the users to express themselves through metaphors and associations, sometimes revealing very delicate and irrational motives. Creative and projective methods offer these ways of expression*" (Mattelmäki, 2006, p. 31).

In other words, one of the major challenges of user research is to make tacit and latent knowledge visible. These types of studies require methods for examining phenomena that cannot be grasped by means of direct observation and understanding. In making tacit knowledge visible, the most important issues are finding an applicable research method, cooperation and working methods. (Luojus, 2010). Although a number of user-centered design methods are still relevant, new methods are necessary for addressing the challenges of making tacit and latent knowledge visible.

Towards Student-centered Research and Development

Laurea University of Applied Sciences is focused on service innovations. Laurea's pedagogical model is Learning by Developing (LbD), which is based on learning through R&D. In the LbD model, both students and teachers can develop their competencies by participating in R&D projects that address the phenomena and problems of real-life workplaces, which require the generation of new knowledge. Teaching progresses through R&D projects conducted in close cooperation with companies and other organizations.

The LbD-based innovation process and Laurea's 8,000-strong student body enable rich interaction with end users, companies, and the public and third sectors in R&D projects. Thus, Laurea's way of integrating the three tasks of Finnish universities of applied sciences – (1) education; (2) research, development and innovation; and (3) regional development – is very compatible with '*the Living Lab philosophy*'.

The starting point for the development work was to produce novel competence by integrating teaching and studying with genuine workplace development. The development work focused mainly on user participation in the innovation process, the development of UCD and Living Lab research methods, and generating new design solutions or service innovations. Professionals from ICT companies and academics in the field of ICT were consulted in the planning phase of the study module.

The objectives of the development work were: (1) to disseminate a problem-based, developmental and research-oriented higher education approach to studying; and (2) to link assignments to real-life projects in collaboration with companies in the field of ICT. In addition, the development work aimed to provide students with competence (3) to gather, structure and apply information in authentic development contexts; (4) to use various development tools and

models in a diverse and flexible way in the different phases of the UCD process; and (5) to apply UCD processes and research methods in their studies and various R&D activities.

Several traditional UCD research and service design methods and tools are used in the Business Information Technology degree programme at Laurea. In particular, the focus of our R&D interests was on developing new research methods, techniques and tools for gaining a better understanding of end users, usage and the context of use.

In order to carry out the development work, we arranged a practical experiment that combined five study units under the single ICT Production Process (25 credits) study module, which followed the model of human-centered design of interactive systems, also known as the user-centered design (UCD) process (Figure 1).

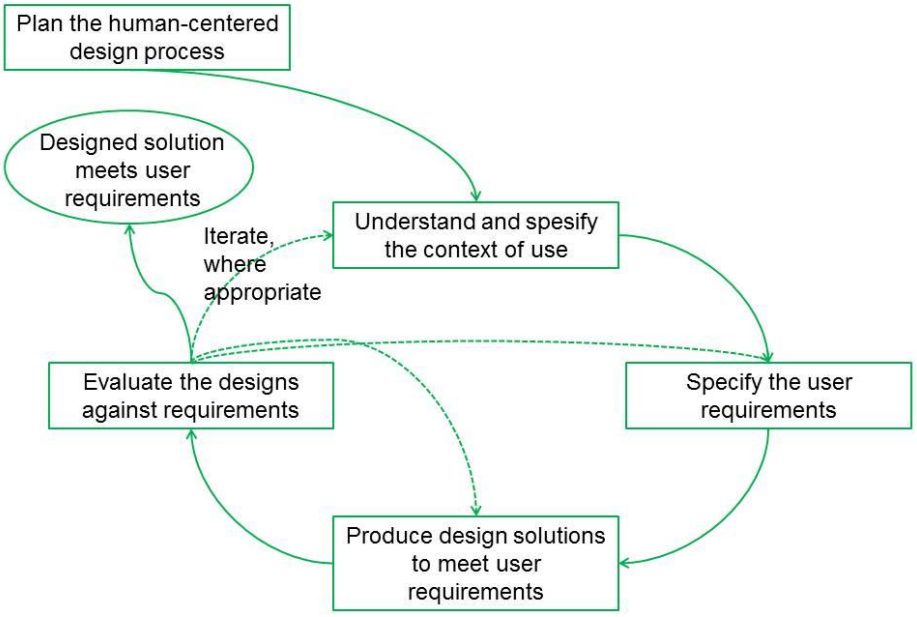

Figure 1. Human-centered design for interactive systems (Adapted from ISO 9241-210).

The experiment involved a dual purpose: In the study module, students complete intermediate ICT studies in conjunction with a module on user-centered design, which are integrated into an R&D project. This meant that the students had two parallel tasks to complete: (1) to design an interactive system to solve authentic development needs, and (2) to apply UCD research methods that support collaboration between end users and interaction designers and the creation of mutual understanding. The coursework involved three different levels: (1) exploring the theoretical background of different development tools and models as well as research methodology; (2) applying theory to R&D in practice, and (3) evaluating theory, models, activities, the development process, tools and their use. Reflexive examination of theory and action promoted diverse and creative use of tools and models.

The studies in the ICT Production Process module formed a dualistic innovation model (Figure 2) with the following elements: (1) a continuous development process in "*a test bed*", where applied and innovative UCD methods, tools and techniques are tested in an authentic

development setting in a safe and guiding learning environment; and (2) the application of developed research and development competence in Living Lab activities conducted in Laurea's diverse R&D projects (Vilkki, 2008). Researchers, other experts, operating environments and research methods are always selected individually depending on the needs and objectives of each R&D project.

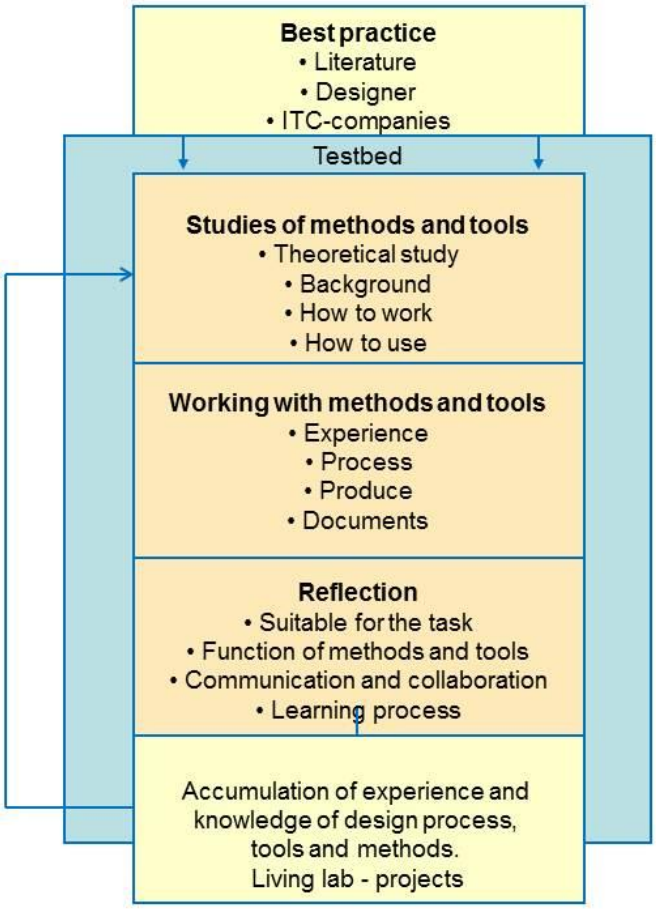

Figure 2. A dualistic innovation model (Vilkki , 2008).

Developing Participatory Research and Design Methods

A test bed environment forms the core of development efforts, where competence in user-centered design is advanced through experimentation with new research methods, techniques, tools and tailored design process models. The new UCD research and development methods are developed to gather information on users' needs, dreams, experiences, values and on the physical, social and technical usage context, as well as on the usability and suitability of the developed product or service to users' lifestyles and everyday lives. '*Mutual reflection'* on the gathered research data with the end users, who participate in the UCD process, helps researchers and interaction designers to gain a better understanding of users' world. (Luojus, 2010). The following are examples of participatory technologies and tools that were developed by students and tested in a test bed environment.

The objective of Hyökki's master's thesis was to find out how visual eye tracking data (Figure 3) could be used as a medium for creating shared understanding between users and designers, especially in the area of service design. Whereas eye tracking data is usually analyzed with statistical measures, Hyökki's study focused on a qualitative discussion on the use of the eye tracking data as a medium in the service design process dialogue. The pilot study examined the first impressions created by a library and the way users found library materials. The study indicates that gaze replay can be used as a catalyst towards a richer explanation. Participatory interpretation of visual eye tracking data brings users and designers together in constructive dialogue. (Hyökki, 2011).

Figure 3. A snap shot of gaze replay in a pilot study on a library space (Hyökki, 2011).
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Lahti's study focused on the way the generative participatory RuffProto design tools designed by Lahti functioned in a participatory design workshop. RuffProto tools (Figure 4) include artifacts that can be attached together with magnets and Velcro, symbolizing ideas and user interface elements relating to digital equipment for participants. User data summary cards designed by Lahti aim to facilitate the analysis of the participatory workshops results (Lahti, 2011).

Figure 4. Observing the use of a RuffProto prototype in a real-life context (Lahti, **2011**). *Published with permission of the copyright owner.*

A high number of Business Information Technology students take part in R&D projects in either national or international networks such as Kinos, Get a life, Quadruple Helix, Helsinki Living Lab, ICT-SHOK/Flexible Services/User Driven Open Innovation, BALLAD/Baltic Living Labs. For example, Hoffren's thesis project was executed as part of the international, EU-funded Ballad project with the overall objective of creating a common business model for the Living Labs Network in the Baltic region. Hoffren examined the Living Lab approach from the perspective of small and medium sized companies (SME). The aim of the study was to determine what conditions and expectations SMEs have for their involvement in Living Lab activities. The study combined both traditional interview methods and a participatory co-design approach. Hoffren designed a Living Lab toolkit or game (Figure 5) to assist SMEs in perceiving the Living Lab concept and its opportunities as well as to further define the conditions and expectations of SMEs for their involvement in the Living Lab (Hoffren, 2011).

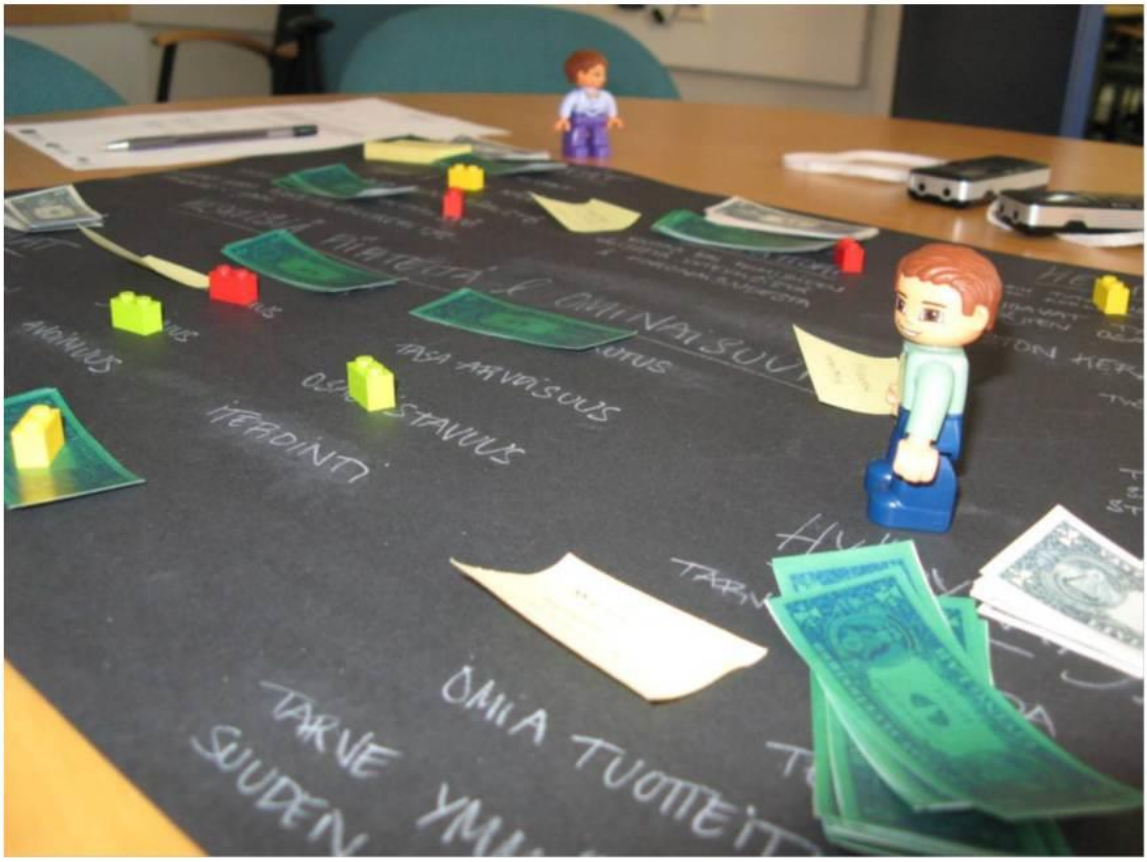

Figure 5. The Living Lab: Assisting SMEs (Hoffren, 2011.) *Published with permission of the copyright owner.*

The aforementioned participatory methods, technologies and tools encourage users to express their thoughts, needs, wishes, feelings and experiences. All of the tools aim to explicate tacit and latent knowledge. The projects that are currently in progress provide new and interesting opportunities to integrate students into research and development activities in an international context. For example, the "User-Centred Design for Innovative Services and Applications" (UFISA) project facilitates the development of joint education between universities in Southern Africa and Finland. The partner universities join their activities around an important multidisciplinary area of education and development: user-centered design of information and communication services for communities. The education programme benefits communities in Southern Africa through innovative ICT-based prototype services. The universities benefit from the communities by being able to provide international teaching in real-life settings which are linked to functional living labs in Southern Africa.

Another project called "Confident Motion" (COM'ON) addresses the perceived orientation and navigation challenges and special needs that older people experience throughout the whole chain of travel using public transportation. The overall objective of the COM'ON project is to develop a mobile platform and associated services, which offer coping support to older persons using public transportation. The development of COM'ON is based on user-centered methodology.

End users inform, co-create and evaluate the design solutions in every step of the design process, from user understanding, idea generation and concept development to the prototyping and evaluation of the final prototype. User needs are identified, new design solutions are generated and user requirements are specified through ethnographic studies, observations as well as participatory workshops and usability evaluations. The concept evaluation and prototyping activities include co-creation workshops and user evaluation in a living lab environment. Business model innovation will be an integrated part of the concept development process.

Results

Previously, higher education has mainly adhered to a traditional academic pattern of lectures, assignments and exams. Theory and exercises had formed series of unrelated assignments. Laurea's way of integrating its three tasks by using the LbD model has offered opportunities to reform teaching and learning practices. Linking studies to genuine R&D projects with outcomes that benefit real-life workplaces offers a new motivating dimension for higher education.

The Living Lab as a learning environment provides students an incomparable opportunity to participate in the development of an entirely novel type of innovation culture. In Living Lab research activities, users are involved in the innovation process from the outset and in partnership with students, experts, businesses and other stakeholders. This approach enables students to develop more in-depth and practice-based competencies, including from the point of view of sustainable development and the promotion of well-being. The results achieved by Laurea's Business Information Technology students in diverse Living Lab projects exceed the learning objectives (Luojus & Vilkki, 2008). In addition, student members in Living Lab projects have been successful in finding employment.

Innovative businesses particularly appreciate multichannel research methods that produce in-depth user data, which can be used to generate increasingly rich and in-depth, qualitative information on users (e.g., visual ethnography, reflective user studies), and the opportunity to actively participate in research. The refreshing ideas of students as representatives of "the next generation" in research teams have been warmly welcomed.

The competence gained through participation in national and international networks and R&D projects have made Laurea '*a strong Living Lab actor'*. Laurea Living Labs Network, which comprises different Laurea units and research teams, is part of the European Network of Living Labs (ENoLL). The membership opens up excellent cooperation opportunities both for Laurea UAS and its partner network. The ENoLL membership enables the sharing of best practices and the further development of Living Lab activities together with other network members.

The integration of higher education studies in Business Information Technology, Living Lab research and development activities on the one hand and the LbD model on the other seems to fulfill the statutory requirement for Finnish universities of applied sciences to combine education, R&D and regional development. Laurea has been appointed as a Centre of Excellence both in education (2008-2009 and 2004-2005) and in regional development (2006-2007 and 2003-2004) by the Finnish Higher Education Evaluation Council (FINHEEC). On the basis of its

LbD model, Laurea was nominated as a Centre of Excellence in Education for 2010 – 2012. Some of the aforementioned R&D projects were evaluated by FINHEEC.

Conclusion

Although current Living Lab activities may appear product- or company-driven, the approach can offer technologies and tools for developing (digital) service systems (cf. service dominant logic), where the development target is larger than a single product and can comprise the networks of several producers. The benefits of openness and multi-actor collaboration have been recognized, but their practical implementation is still somewhat rare. Completely new concepts and methods that cross the traditional boundaries of disciplines are necessary in the processing of extensive entities (Kuutti, Keinonen, Norros & Kaasinen, 2007). The new methods developed need to address the following challenges: (1) the Living Lab approach aims at a more permanent innovation ecosystem than those enabled by one-time interview or observation studies; (2) the innovativeness of the Living Lab ecosystem can be considered to be based on the meeting of different actors acting in an open innovation environment; and (3) in a Living Lab ecosystem, owing to the openness of the knowledge creation processes and the multi-actor approach, the research is focused on entities larger than single products, such as the design of living and operating environments (Luojus 2010). Although the Living Lab approach is traditionally considered to offer great benefits particularly in the development of ICT-based solutions, in principle, it can be applied in any product or service development process.

Living Lab thinking has proved to be coherent with Laurea's LbD model and to integrate the three tasks of Laurea. Interest in Living Lab thinking has arisen in several Finnish universities of applied sciences, and diverse partnership networks have been formed around Living Lab activities among the institutions. It appears that universities of applied sciences and their partnership networks can play a significant role in maintaining Living Lab activities in Finland.

Process development is the most important outcome of the development work. A qualitative research approach and the application of research methods of diverse disciplines form a basis for innovative UCD methods and process development. The aim of the development work was to provide in-depth knowledge on topics such as user experiences, diverse use contexts and culture of usage as well as the adoption of new technological applications and devices. The use of methodological triangulation and mutual reflection on the gathered research data with the end users creates prerequisites for multifaceted analysis and increases the reliability of results in R&D projects. Besides data gathering methods, we also developed methods for analyzing the gathered data in collaboration with interaction designers and end users. Versatile use of creative and collaborative methods reinforces multi-actor collaboration and the explication of tacit knowledge. Mutual reflection on user data and the creation of shared meaning with end users has enhanced our ability to empathize with the user. We see '*the user's world as a source of innovation'.*

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Creating a Blended Cooperative-Learning Classroom

Edward J. Baum

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Abstract

This report describes the implementation of a blended chemistry classroom for non-science honors majors, a face-to-face Process-Oriented Guided-Inquiry (POGIL) classroom coupled with on-line lecture instruction. The objectives of the project are to reduce the confusion and negative attitudes with which many students greet discovery learning and to promote student engagement with the course. The on-line instruction presents useful background material in a mini- lecture format that is designed to help orient students to the POGIL lessons. Face-to-face classroom time is reserved for concept building and concept testing in a social setting. Assessment results show that student attitudes toward discovery learning are improved in a blended classroom. Student engagement is extremely good. There appears to be an improvement in the performance of students in the bottom quartile of the class. Also, the blended course proves to be more economical of instruction time than a traditional POGIL course.

Keywords

Blended/Web-based learning, student-centered learning, inquiry-based/discovery learning, process-oriented guided-inquiry learning, STEM.

Introduction

This report describes the implementation of a blended process-oriented guided-inquiry learning ("POGIL") teaching strategy. Interest in blended guided-inquiry instruction, particularly in science, technology, engineering, and mathematics ("STEM") education, results from the interplay of two important trends in contemporary teaching practice. First, active learning methods produce superior learning outcomes in education in general and in the teaching of STEM subjects in particular (Bransford, Brown, & Cocking, 2000; McKeachie, Pintrich, Yi-Guang, & Smith,1986). The most effective teaching practices now emphasize strategies in which students are given responsibility for actively constructing their own knowledge base, usually in a social setting (Bodner, 1986; Spencer, 1999; Bodner, Klobuchar, & Geelan, 2001). Second, much ongoing effort to enhance the quality of teaching by STEM educators, technophiles by and large, involves integration of modern technology into the classroom.

There is no specific definition of a blended classroom. Blended learning implies any use of internet technology coupled with face-to-face instruction in a physical classroom. Our blended

POGIL classroom couples face-to-face guided-inquiry learning in a physical classroom with an on-line instructional component that is intended to enhance student engagement and reduce the confusion with which students often initially greet guided-inquiry learning. On-line instruction is used to present useful information that should help orient students to the group work. Classroom time is reserved for the concept building and concept testing phases of learning.

Course Design

The course described here is a one-semester laboratory science course that is part of the general education sequence for non-science Honors majors in a medium-sized, mid-Western state university. The course is team-taught and consists of physics, chemistry, and physiology necessary to understand how the human body distributes and uses chemical energy. Only the chemistry section of the course, comprising approximately one third of a semester in length, was evaluated in this study.

Twenty four students, primarily sophomores and juniors, were enrolled, a typical number of students taking the course. All were non-science majors. At the beginning of the course, the students were surveyed concerning their engagement with science, their engagement with technology, and their involvement with education in general. Most participants reported a negative attitude towards science. Some participants reported negative experiences with their prior science education. Few students exhibited interest in technology. However, the students did assert a strong involvement with education in general.

The POGIL method consists of a carefully structured programme in which students build on their prior knowledge and experience as they engage in a cognitively challenging situation (Lewis & Lewis, 2005; Spencer, 1999; Farrell, Moog, & Spencer, 1999). Group work takes the place of the lecture in POGIL. Students are given much of the responsibility for learning the material as they complete course activities working in small groups. The structure of most classroom activities is based on the learning cycle concept (Kolb, 1984; Spencer, 1999). The process begins by guiding the students through data processing and concept formation with a series of simple and direct questions. The students are then led through concept testing and application with ever more difficult and open-ended exercises. POGIL lessons are designed to be completed within one or two class periods.

The instructor's role in a POGIL classroom is to serve primarily as a facilitator of group learning, to monitor progress and to intervene when guidance is needed. Usually, the instructor does not answer questions directly, but instead helps students resolve uncertainties for themselves. The students, for their part, are assigned specific team roles to perform such as manager, recorder, assessor, and presenter. This promotes positive interdependence and accountability (Johnson, Johnson, & Smith, 1991) and provides opportunity to develop process skills.

The presentations, made available to the students on the internet, are assigned as homework prior to in-class group work. Class time is reserved for concept formation, testing, and application. The web portion of the class does not include concept formation and validation because group study is most effective and tutoring is most needed during such activities. The POGIL method

places strict requirements on the structure of a lesson and, in particular, on any activity which precedes concept formation. In our blended classroom, we introduced videotaped mini-presentations of 10 - to 20-minute duration designed to orient and engage the students in the class work as well as to present some useful information. For instance, preliminary on-line presentations might introduce basic definitions or describe important models such as the periodic table of the elements. Also, the students may be reminded of fundamental concepts developed previously which would be applicable in the group work to follow.

It is of concern that the pre-recorded mini-presentations might prove to be counterproductive and inhibit rather than facilitate student progress and engagement. Social interaction is an important component of the POGIL process, after all. Nevertheless, there are some advantages to on-line learning. The schedule is conveniently flexible, and students are free to learn at their own pace. Students do not risk being left behind in fast-paced group work. In any event, on-line learning is well suited to students with a strong bias towards learning, students who are highly motivated, and students who have strong time management, literacy, and technology skills. These are all characteristics of Honors students, in general.

Course Assessment

We compared student performance in the chemistry section of the blended class offered in fall 2011 with that of student performance in the chemistry section of normal POGIL classes offered during the eight year period from 2005 to 2012. Median exam scores and score distributions for all years except 2007 and 2009 are shown in Figure 1. Between 17 and 22 students participated in the course each year. Thick candlestick bars show the range of exam scores in the second and third quartile of the grade distribution. Narrow candlestick bars show the complete range of individual student scores other than the numbered outliers. (The POGIL course was not offered in 2007, and the 2009 grade distribution is unique and proved to be an outlier).

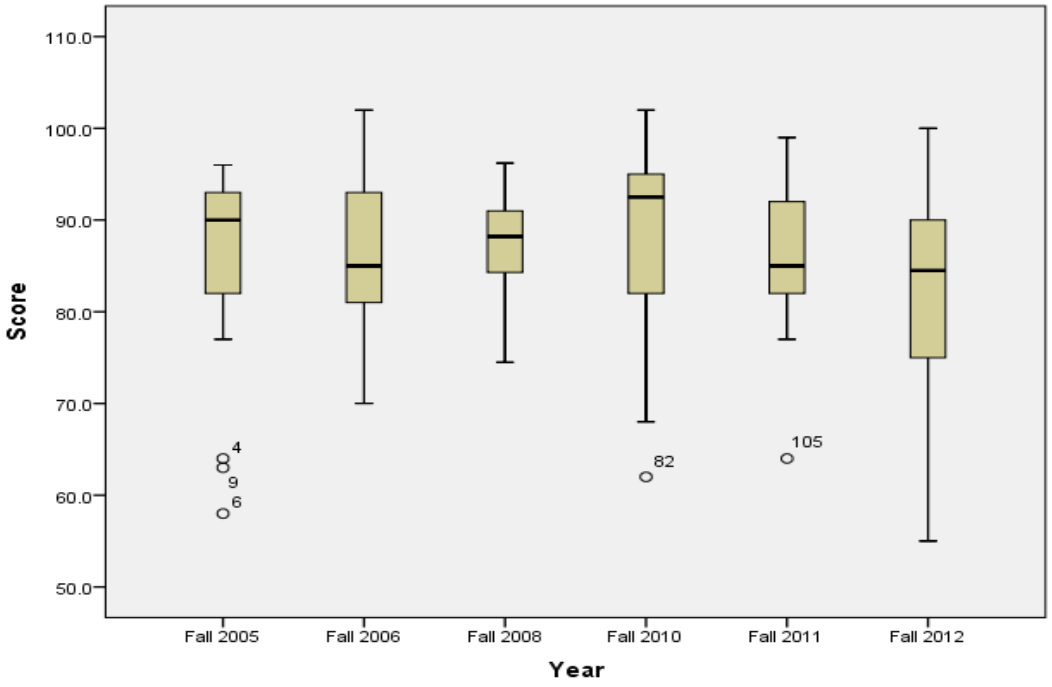

Figure 1. Median exam scores and distributions for the chemistry portion of "Human Body in Motion" (2005 - 2012).

Table 1 summarizes the results. Independent 2-sample t-tests were performed with SPSS to compare score distributions on chemistry exams given in the traditional course with the score distribution of the chemistry exam given in 2011 in the blended POGIL course. Student grade distributions proved to be statistically indistinguishable in both the blended POGIL course and in the traditional version of the course. The distribution for the blended-POGIL class was perceptibly narrower than the others, however. The lower quartile was truncated in comparison with the normal POGIL distributions. This suggests that the on-line presentations may have helped the weakest students to improve their performance, although there is not enough data to support such a conclusion definitively. This issue is the subject of further investigation.

Table 1. Exam scores and distributions (2005 - 2012)

Study Period	Sample Size	Mean Exam Score	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Fall 2005	17	84.882	12.1803	2.9542	78.620	91.145	58.0	96.0
Fall 2006	17	86.059	9.1274	2.2137	81.366	90.752	70.0	102.0
Fall 2008	22	87.409	6.4638	1.3781	84.543	90.275	74.5	96.2

Fall 2009	17	95.088	6.0058	1.4566	92.000	98.176	75.0	100.0
Fall 2010	22	88.455	10.7248	2.2865	83.699	93.210	62.0	102.0
Fall 2011	21	86.381	8.4230	1.8381	82.547	90.215	64.0	99.0
Fall 2012	24	82.917	10.4670	2.1366	78.497	87.336	55.0	100.0
Total	140	87.111	9.7359	.8228	85.484	88.738	55.0	102.0

Anecdotal evidence shows that the on-line presentations assigned as homework prior to group work in the course did help some students adapt to the POGIL cooperative learning approach. Several students commented that they did not experience the confusion in the blended POGIL course that they had experienced in other guided-inquiry courses they had taken. The students offered little or no resistance to inquiry learning, and they exhibited satisfaction with their achievement in the blended POGIL course. Because of prior experience, many non-science majors have negative impressions of science courses and usually report poorer performance in POGIL courses than is actually the case (Felder & Brent, 1996; Silverthorn, 2006). This perception problem did not occur in the blended POGIL course. Also, several students reported that the blended POGIL experience was more enjoyable than expected.

A survey of student engagement was distributed at the conclusion of the chemistry segment of the course. The questions examine student participation in class and student interest in the material being studied. This is similar to questions about student engagement asked in Part 1 of the National Survey of Student Engagement (NSSE). The survey questions along with the distribution of responses to each question are shown in Table 2 (for both course versions).

The results show that the students were highly engaged in both the blended and traditional version of the POGIL course, more so than is usually reported in engagement studies. Almost all of the students came to class prepared, having completed their homework assignments. Most students reported that they worked hard to meet the instructor's expectations. Almost all students actively participated in class, most of them on a regular basis. Furthermore, students recognized the connection between course material and other aspects of their lives, and they discussed these issues outside of class. Such activities are among those that are performed most poorly by college students (e.g., NSSE, 2008) and the results of this study are exceptionally good. The responses are substantially the same for the blended course, offered in fall 2011, and the traditional course, offered in fall 2012, as indicated by the Fisher test's p-values. A response distribution virtually identical to that of the blended course was obtained in a different traditional Honours course given during the same semester.

Table 2. Engagement survey responses (fall 2011 / fall 2012

Did you engage in the following activity?	Never	Some-time	Often	Very Often	Fisher's Test p-Value
	fall 2011 / fall 2012				
Q1. Asked questions/ contributed to chemistry discussions	1/0	5/11	13/7	3/5	0.1108
Q2. Came to class without completing chemistry readings and assignments	15/10	5/11	1/2	1/0	0.1534
Q3. Discovered some material from the chemistry section to be relevant to other aspects of your life.	1/1	14/12	5/8	2/2	0.8727
Q4. Worked with classmates outside of class to prepare chemistry assignments	7/6	8/9	3/8	3/1	0.3744
Q5. Worked harder than you thought you could to meet instructor's expectations	3/6	9/11	9/4	2/2	0.3707
Q6. Discussed ideas from the chemistry section outside of class.	4/4	12/13	4/4	2/2	1

The chemistry section of the course is offered over a period of four weeks for three hours per day on two days per week. It covers the processes that convert nutrient energy into work and heat in the human body. The level of presentation of topics is similar to that in *Chemistry in Context: Applying Chemistry to Society (*Middlecamp, Keller, Anderson, Bentley, Cain, & Ellis, 2012). The blended POGIL sessions proceeded quickly, and it was possible to add a section on muscle work and energy production to the syllabus of the blended course without expanding the time allotted to the chemistry section Baum (2013). The main anaerobic and aerobic pathways of producing adenosine triphosphate in muscle tissue were examined along with the production and removal of important by-products. The additional material represented an expansion of the course content by about 10%.

Conclusion

The results show that the students performed at least as well in the blended course as in the traditional POGIL course. Based on anecdotal evidence, blended learning did help students to adapt to a cooperative learning strategy. There appeared to be no student resistance to the teaching strategy in the blended course, and the perception problem sometimes observed in POGIL classes did not occur.

The blended POGIL classroom was more efficient and economical of face-to-face time than the traditional POGIL classroom. Time usually taken to address confusion and refocus students in a normal POGIL course was spent covering additional material. Teachers often complain that student-centered instruction is too time consuming and that not enough important material can be included in an active learning syllabus. The blended classroom appears to be, at least, a partial solution to this problem.

Many students become disengaged as they perceive active learning to be difficult and confusing. This is compounded by a common perception that science is dry, boring, and irrelevant to student's lives. The results of this study show that good student engagement can be maintained in a blended POGIL class.

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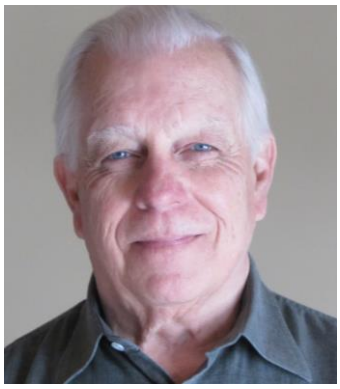
Bio



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PK-12 Teacher Candidates' Beliefs and Knowledge about English Learners

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Abstract

This study examines the beliefs and perceived preparedness of pre-service PK-12 teacher candidates regarding English learners (EL) in regular classroom settings because of an ESOL content-infusion simulation experience during an early general methods class. Teacher candidates' beliefs toward English learners and perceived pedagogical preparation to teach English learners were examined for differences between those receiving the content-infusion simulation and those receiving traditional instruction. Those receiving the content-infusion simulation perceived that they were significantly more prepared on a number of survey items. The results reveal salient benefits of this experience on the teacher candidates' beliefs about English learners and their beliefs about their pedagogical preparation to teach English learners in a regular classroom setting.

Keywords

ESOL, teacher candidates' beliefs, English learners, content infusion, pedagogical preparation

Introduction

Many pre-service teacher candidates report that they feel unprepared to work with culturally and linguistically diverse learners (Mergler & Tangen, 2009). While they are busy learning content and how to teach that content, they may feel overwhelmed when asked to add the responsibility of making the content comprehensible to English learners (ELs). Yet increasingly, beginning PK-12 teachers enter classrooms filled with diverse learners, many of whom are not yet fully proficient in English, their second language (L2). Universities preparing teachers for the diverse student body of the 21st century are striving to help their teacher candidates teach English learners various subjects in ways they can understand even if their English skills are still developing (Nutta, Mokhtar, & Strebel, 2012).

The setting for this study was an undergraduate general methods class at an institution of higher education in the United States. All teacher candidates in state-approved teacher preparation programs in this state are required to receive instruction in teaching English learners. Depending on the area of certification, that instruction ranges from 75 hours for majors that do not specifically teach literacy skills to 300 hours for majors that do (elementary education,

exceptional student education, early childhood education and English language arts education). One or two stand-alone courses focusing specifically on the theory and practice of teaching English learners comprise 60-120 hours of instruction and the remaining 15-180 hours are infused into other education classes; the general methods class is one such class.

This study identifies important elements of teacher candidates' beliefs about English learners and beliefs about their pedagogical preparation to teach English learners in a regular classroom after participating in an ESOL content-infusion simulation.

Theoretical Perspectives and Related Research

Teacher Attitudes and Beliefs

Little is known about how English to Speakers of Other Languages (ESOL) pre-service teachers' beliefs and prior experiences shape their learning process in teacher preparation programs, particularly in the area of second language reading instruction (Aoulou, 2011). Preliminary research on teacher candidate attitudes toward English learners has shown that stand-alone courses focusing on English learners can change candidates' perceptions of their own knowledge and skills regarding teaching English learners (Smith, 2011), and can improve attitudes about diversity (Weisman & Garza, 2010). Weisman and Garza (20120) recommend including an emphasis on linguistic diversity throughout the teacher preparation curriculum so that pre-service teacher candidates will have repeated and varied exposure to this crucial issue. However, the effects of activities and assignments that are infused into general teacher preparation courses are not well established. The potential for connecting pre-service teacher candidates' developing knowledge, skills, and dispositions for teaching with a focus on English learners holds promise for preparing teacher candidates to address these students' needs as a natural part of their planning, carrying out, and evaluating instruction in their content areas.

Second Language Experiences

Second language educators have used what has been termed "shock language" activities for some time, both in pre-service and in-service teacher education and in PK-12 instruction (Kubota, Gardner, Patten, Thatcher-Fettig, & Yoshida, 2000; Meskill, 2005). Shock language activities typically involve presentation of content in a language unknown to the candidates, followed by a discussion of what it felt like to not be able to understand or communicate during the experience. For many candidates who have never spent time in an environment where English is not spoken, such an experience can be a very eye opening experience. However, just knowing how difficult it can be to try to do something in an unknown language does not prepare a pre-service teacher candidate to present concepts and topics to English learners in a way they can comprehend. For this reason, Nutta (2003) developed a simulation activity in Italian to immerse pre-service teacher candidates in comprehensible instruction, including presentation of content and participant tasks and assessment, each of which can be incorporated into PK-12 instruction of various content areas.

Research Question

Teacher candidates are exposed to a wide variety of experiences to help prepare them for their future classroom experiences. Some of these experiences are directly related to changing their beliefs and some are related to increasing their knowledge. The present study examines the impact of an ESOL content-infused simulation on several elements of teacher candidates' beliefs about English learners and their perceived preparedness to assist these students in their teaching. Given the need for teacher preparation programs to prepare teacher candidates to meet the specialized needs of

ELs, determining the effects of a simulation that had a lasting effect would be valuable. Thus the study was guided by the following research question: *What are the effects of an ESOL content-infusion simulation on teacher candidates' beliefs and perceived pedagogical preparation to teach English learners in a regular classroom setting?*

Research Method

Teacher candidates are exposed to a wide variety of experiences to help prepare them for their future classroom experiences. Some of these experiences are directly related to changing their beliefs and some are related to increasing their knowledge. The present study examines the impact of an ESOL content-infused simulation on several elements of teacher candidates' beliefs about English learners and their perceived preparedness to assist these students in their teaching. Given the need for teacher preparation programs to prepare teacher candidates to meet the specialized needs of

Participants and Setting

This study involved teacher candidates at a large, urban university in the southeastern United States. The participants were enrolled in different sections of a junior-level general methods class during fall (2011) semester. Sixty-nine teacher candidates (n=69) completed a survey. Forty-nine of the teacher candidates participated in the simulation activity; nineteen of the respondents did not participate in the simulation. One participant did not answer the question to indicate if he/she participated in the simulation. Fifteen percent of the participants were male; 85% were female. Six percent of the participants were African American; 1% was Asian; 74% were Caucasian/White; 10% were Hispanic/Latino; 9% were Multiracial. English was the first or native language of 91% of the participants; 9% had a first or native language other than English. Nine percent of the non-native English speakers had been considered ESOL students during their PK-12 schooling.

The twenty-minute simulation was delivered by a team of faculty and doctoral students in various sections of the general methods class. The simulation was highly interactive and involved teaching how to make orange juice in a language other than English; these languages included Italian, Swiss German, and Korean. The goal of the interactive experience was to give the teacher candidates an opportunity to learn content in a language other than their native language, simulating the experience of an English learner during a unit of instruction in a regular classroom setting. The activity began by stating in the second language (L2) that only the L2

would be used. The presenter then identified a number of objects used in making orange juice by naming each while holding it for all to see. The presenter then began the four-step process of making orange juice, narrating each step in the L2 as she performed it. This process was repeated, and then the presenter asked for a volunteer from the class to come and perform the steps alongside the presenter's commands.

At first, the steps were kept consistent with the original modeling that the presenter provided, but during subsequent volunteer performances, the sequence of the steps was reordered, different colors of the cups were referenced to differentiate the command the student performed, and other changes were made to show how true comprehension, rather than mere mimicking, was taking place.

After several rounds of volunteers making orange juice, the presenter showed four poster-size photos of the steps, asking the class to indicate a thumbs up if the phrase she uttered matched it or a thumbs down if not. She then passed out the photos to teacher candidates and asked them to raise the photo when she stated the corresponding phrase. Then, she asked each participant, in words and with gestures, to come to the front of the classroom and hold the photos in sequence. Once they were lined up properly with the photos, she gave each participant a large sentence strip with the phrase in the L2 and repeated the phrase while pointing to each word.

The students returned the photos and sentence strips, and she then mixed them up and randomly distributed them to teacher candidates who had not yet participated in any of the tasks. Through gestures and language she indicated that each photo holder should find his corresponding sentence strip holder, and then all 8 individuals should line up in the correct sequence in front of the class.

After verifying the accuracy of the matching photos and sentence strips, the presenter retrieved them and distributed a fill-in-the blank test of the phrases and photos of each of the four steps. Each phrase lacked one word, and she indicated that students should try to write the missing word from memory. After think time elapsed, she dictated the sentences and asked students to write any missing words as she said them. Finally, she showed the four sentence strips in order to allow students to check their answers.

Following the individual assessment of the activity, the presenter praised the participants in the second language and returned to English for debriefing. The teacher candidates were asked to share how they had felt participating in a lesson whose language they didn't know. They were then asked to identify everything in the simulation lesson that enabled them to comprehend. The strategies list they created then became the basis for them to consider when making accommodations for non-English speakers or beginning English speakers in their lesson plans.

Data Collection and Analysis

The survey instrument consisted of 34 items, 14 on demographics of the teacher candidates, and 20 on their beliefs about English learners and beliefs about their pedagogical preparation to teach ELs in a regular classroom setting using a Likert scale. Several questions were tailored after the teacher sense of efficacy scale (Tschannen-Moran, & Woolfolk Hoy, 2001) but were adapted for

the focus of teaching English learners, while others had been created during a project with ESOL infusion.

The twenty questions pertaining to the teacher candidates' attitudes, beliefs, and self-efficacy were presented in random order within the survey. Questions focusing on the teacher candidates' attitudes included statements such as: "English should be the only language of instruction for core PK-12 school subjects, such as language arts, math, science, and social studies" and "The PK-12 school system will be strengthened by English learners." Questions focusing on the teacher candidates' beliefs included statements such as: "How much can you do to motivate English learners who show low interest in school work?" and "How much can you do to respond to difficult questions from English learners?" Questions focusing on the teacher candidates' self-efficacy included statements such as: "How familiar do you feel with English learners' levels of English language proficiency: beginning; intermediate; advanced?" and "How familiar do you feel with a variety of teaching strategies to promote age/grade/level-appropriate social and academic English learning?" The questionnaire was distributed through the survey feature of an online electronic portfolio system. The surveys were voluntary and anonymous.

Results

Table 1 presents the mean and standard deviation for each item for both groups of teacher candidates, those who received the orange juice simulation and those who did not.

Table 1. Participant attitudes toward EL issues

	No OJ lesson			**OJ lesson**		
	n	$\bar{x}$	**SD**	**n**	$\bar{x}$	**SD**
English should be the only language of instruction for core PK-12 school subjects, such as language arts, math, science, and social studies.	19	2.47	1.07	49	2.51	1.06
English learners have a right to expect that PK-12 schools will make changes to accommodate them.	19	3.84	1.21	49	4.04	0.71
The PK-12 school system will be strengthened by English learners.	19	3.79	1.08	49	3.90	0.90

While not statistically significant, the teacher candidates who received the orange juice simulation did have more positive attitudes toward EL students when responding to the statements, "English learners have a right to expect that PK-12 schools will make changes to accommodate them (4.04)" and The PK-12 school system will be strengthened by English learners (3.90)."

Table 2 illustrates that the perceived preparedness was significantly higher for teacher candidates who received the orange juice simulation on seven items: their ability to help English learners think critically (4.27); get English learners to believe they can work well in school (4.41); respond to difficult questions from English learners (4.08); gauge the comprehension of English learners regarding what they have taught (4.14); improve the understanding of an English learner who is failing in school (4.14); use a variety of assessment strategies that take into account English learners (4.39); and provide appropriate challenges for very capable students who may be hampered by the English language (4.20).

Although not statistically significant, the mean scores for the remaining items were all higher than for the teacher candidates who did not receive the orange juice simulation. Participants reported that they could motivate English learners who show low interest in school work (4.25); adjust their delivery of lessons to the proper level for individual English learners (4.39); provide alternative explanations or examples when English learners are confused (4.29) and implement alternative explanations for teaching and learning in their classrooms (4.20).

Discussion and Conclusion

This pilot study painted a positive picture in terms of the use of the orange juice simulation in helping teacher candidates enrolled in a general methods class understand the needs of EL students and develop a sense of self-efficacy. First, the teacher candidates clearly articulated that they feel prepared to educate EL students that they would encounter in their mainstream classrooms. While their self-perceptions were not verified, sensitizing the teacher candidates to the EL students' experience seemed to impact both the teacher candidates' attitude toward EL students and their perceived preparedness.

Table 2. Participant perceived preparedness

	No OJ lesson			OJ lesson		
	n	$\bar{x}$	**SD**	**n**	$\bar{x}$	**SD**
Help your English learners think critically	19	3.74	0.65	49	4.27*	0.76
Motive English learners who show low interest in school work	19	3.48	0.69	48	4.25	0.79
Get English learners to believe they can work well in school	19	3.89	0.74	49	4.41*	0.73
Respond to difficult questions from English learners	17	3.53	0.62	48	4.08*	0.87
Gauge the comprehension of English learners regarding what you have taught	19	3.74	0.87	49	4.22*	0.82

Improve the understanding of an English learner who is failing in school	18	3.67	0.91	49	4.14*	0.84
Adjust your delivery of lessons to the proper level for individual English learners	18	4.11	0.68	49	4.39	0.81
Use a variety of assessment strategies that take into account English learners	19	4.00	0.58	49	4.39*	0.79
Provide alternative explanations or examples when English learners are confused	19	3.95	0.71	49	4.29	0.84
Implement alternative explanations for teaching and learning in your classroom	18	3.89	0.83	49	4.31	0.77
Provide appropriate challenges for very capable students who may be hampered by the English language	19	3.74	0.87	49	4.20*	0.82

*significant ($p<.05$)

Obviously, there may be other factors that impacted these teacher candidates in addition to the orange juice simulation, including the way the instructor of the general methods course helped them process the orange juice simulation; the exposure during field experience to EL students; or whether the field experience teacher helped the teacher candidates understand any ELs who may have been in the PK-12 classroom. However, the results strongly encourage the continuation of the orange juice simulation.

For EL students in mainstream classrooms, the classroom teacher may be their one and only resource. The classroom teacher's beliefs regarding EL students influence the culture of the classroom and the student outcomes (Durgunoglu & Hughes, 2010). Future research should further investigate the effect of the orange juice simulation and attempt to better control for any teacher and class effects. In addition, qualitative data from teacher candidates may also add to the research on how this shock language activity might help influence their attitudes toward future EL students they may encounter.

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Bridging Gaps and Creating Spaces: Health Education in the New Millennium

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Abstract

This paper focuses on the integration of technology and pedagogy in the design and utilization of the newly constructed 160,000 square foot health and human sciences (HHS) building at Western Carolina University, located in rural western North Carolina. The authors explore key theoretical connections between learning and space, and how these theories were employed when creating the learning spaces throughout the building. The design and technology in the building allows faculty to teach differently, bring the world into the classroom, and share their expertise with others outside of the western North Carolina region. The technology and space/furniture arrangements enhance collaborative learning, modeling the increasingly interdisciplinary and patient centered approach in health care. The authors share their experiences related to some of the logistical and administrative challenges they faced in the design and construction phases of the project, and emphasize the importance of ensuring that the architects and contractors work collaboratively with the academic representatives to maximize the positive impact on student learning.

Keywords

Health Education, learning spaces, built pedagogy

Introduction

When we think of the dimensions of teaching, it is surprising that we do not usually talk about the physical dimension of space. On the surface, the study of instructional space has been largely neglected until the last decade. The physical infrastructure of an educational institution often receives the highest amount of investment and capital funds (as much as $20 billion in 2002), and that infrastructure is one of the most enduring and often iconic aspects of a campus (Nair, 2002). That being said, the design and construction of educational buildings were usually in the hands of outsiders such as architects or builders, for whom such projects were about meeting a set of physical requirements, like creating a building to hold a set number of offices or classrooms (Johnson & Lomas, 2005). Because expertise in teaching and learning and expertise in physical design and construction are held by different sets of people, the two remained, for all practical purposes, separated. This practical separation, however, belied a growing body of theoretical literature that was making significant connections between the physical environment of the classroom and learning outcomes.

In this essay, we will look at five key theoretical connections, or bridges, between space and the work of the university and how these connections were applied to the design, construction, utilization, and development of a new 160,000 square foot Health and Human Sciences (HHS) building at Western Carolina University (WCU), a medium-sized regional comprehensive institution located in rural Appalachia. Opened in the summer of 2012, the building provides a rich case study for the challenges and opportunities inherent in bringing together physical and conceptual space to order to meet the needs of twenty-first century college students.

Connecting Space to Learning

The historical process of linking learning theory with space involves challenging some traditional assumptions about teaching (Bransford, Brown & Cocking, 1999; Chism, 2006). For example, much research on learning has focused on the experiences of the individual learner. In the 1920s, Russian psychologist Lev Vygotsky posited a theory of learning that emphasized the importance of social interaction in cognitive development. His theories became the basis for a field of study known as social learning theory, which emphasizes the significance of environmental factors in promoting motivation, retention, and application of learning (Bandura, 1977). It is now generally accepted that learning is a social activity, and constructive interactions with instructors and peers is a critical factor in achieving higher order thinking. Currently popular offshoots of social learning theory include collaborative learning, situational learning, and team-based learning. (Harding-Smith, 1993; Lave & Wenger, 2001; Michaelsen, Knight, & Fink, 2002). These theories challenge us to think of the classroom not as a collection of individual learners, but rather as a collective, cohesive social space in which interaction can be managed and cultivated.

Architect Pravesh Nair said that much of our current educational architecture is based on a "misguided nostalgia" (2003) for a classroom environment and structure that no longer exists. Although instructors were adopting more social learning activities, physical classrooms continued to be designed to support the traditional lecture format. Experiencing this disconnect, frustrated faculty began to research the effects of a limiting physical environment on learning. Researchers have uncovered close connections between physical space and levels of interaction, motivation and meta-cognition through the influence of such factors as furniture, layout, lighting, attractiveness, temperature, and density. (Beichner, et al, 2006; Chism, 2006; Cornell, 2002; Graetz and Goliber, 2002; Scott-Weber, 2004; Strange and Banning, 2002). The increasing connection between learning theory and space has also made its way into the parlance, with the traditional term "classroom" being replaced with the broader expression "learning space."

By the 2000s, design theories were starting to catch up with learning theories and Torin Monahan coined the term "built pedagogy" to characterize this connection between learning theory and space (Monahan, 2002). The progenitor for much of the recent applications of built pedagogy is the CDIO (Conceive, Design, Implement, Operate) model conceived by Phillip Long and Ed Crawley, and brought to fruition with MIT's Aerospace Research Laboratory (Fielding, 2002; Johnson and Lomas, 2005; Nair, 2003). The CDIO model has been used to develop other learning spaces with the specific intention of increasing low attendance rates and decreasing failure rates and these have been largely successful (Long, 2005).

The potential impact of the physical environment on student learning was a major focus when designing the new HHS Building at WCU. After selecting an architectural firm that was willing to work collaboratively with their customers, the college dean began to identify the appropriate individuals who should participate in the planning process, which helped to bridge the older divide between builder and instructor. Because of the importance of getting faculty buy-in and input early in the process (Villano, 2010), faculty leaders were invited to accompany the dean when visiting academic health buildings on other college campuses to help them create their own unique visions for the building. The architects also met with various program representatives during the building design phase, enabling the architects to develop an in-depth understanding of the unique learning needs of the diverse health programs within the college. As a result, the academic department heads and program directors played a central role in designing their own learning spaces and labs and experienced a shared ownership of the building when the project was completed.

Figure 1. Athletic Training Lab

The design of the building includes a number of unique learning spaces designed to fit the needs of contemporary health care education. For example, the athletic training lab in Figure 1 provides screens above the student work spaces so that students view a demonstration as they practice their skills in simulated settings. In addition to specialized labs for hydrotherapy, athletic training/performance, audiology, and others, there are also two-way interview rooms, clinical spaces for adults and children, and an adaptive living suite, which simulates a real-world apartment where students can work with real or standardized patients who have a physical disability and must learn to negotiate/adapt within their physical living space at home.

The framework of learning as construct also means that learning continues to take place outside of the classroom, even if the instructor is not present. Formal instruction, then, can effectively be supplemented with informal instruction outside of the classroom. The implication for space design is that, institutions must address real and virtual spaces outside the classroom to ensure that they, too, "encourage learning" (Brown 2006; Oblinger & Oblinger, 2005). The architects worked closely with the dean and faculty to design well-lit and comfortable public spaces throughout the building to facilitate student/faculty conversations and exchange of ideas. There are a number of small intimate spaces in the building where students can gather, using large wall screens to project their computer images when working together on class projects or sharing information. The rooftop garden, shown in Figure 2, is located outside the second story atrium and provides a soothing light filled area where students might take a relaxing break while enjoying the beautiful mountain vistas.

Figure 2. Rooftop Garden

Part of the vision of the HHS building design was to encourage students to spend quality time at the building in between and after their scheduled class times. Graduate students have electronic card swipe access to their own labs giving them flexible times in which to practice and enhance their clinical skills. The large student collaborative area on the ground floor has computers and printers set up for student use, a number of small student collaborative spaces with large wall screens, and three private student seminar rooms to accommodate small study groups. There is a seven mile walking and biking trail being developed on the mountainside behind the building and there are three showers available for student and faculty/staff use near the clinic areas. The graduate programs housed in the building each host their own private student lounges that include convenient amenities such as refrigerators and microwaves. There is a similar student lounge area that is shared among the undergraduate students. In addition, there is a coffee shop in the main atrium of the building that sells a variety pastries, sandwiches, and frozen foods, as well

as coffee and specialty drinks. All of these spaces help students feel comfortable but connected, and encourage students to spend time in the building outside of their scheduled class times.

The move into the HHS Building allowed the various health programs previously housed in four different buildings on two different campuses to come together under one roof. Prior to the move the majority of the faculty interactions were limited to annual college meetings or other university functions, making it easier for faculty (and students) to maintain their focus on their individual, more homogeneous programs rather than interacting with colleagues who might have more diverse viewpoints and backgrounds. Interestingly there was a great deal of positive anticipation prior to the move, and the words "when we move into the new building" became an overarching faculty mantra as they projected how collaborative activities between the programs would begin to improve once the physical move took place.

Connecting Space to Students

With the learning-centered revolution occurring throughout higher education, another assumption that needed to be overturned was that classrooms, or learning spaces, were built for instructors (Valenti, 2005). With the increasing demise of instructor-led teaching, learning spaces have come to focus increasingly on the needs of the students, particularly those of the generation known alternatively as Generation Y, Echo Boomers, Net-Gen or Millennials (Howe & Strauss, 2008). Researchers have identified several characteristics of this generation of students that are relevant to space design, including their propensity for social and experiential learning (Brown, 2006). Perhaps the most salient feature of this generation, however, is their digital nativism and the integration of technology tools into all aspects of their lives and lifestyles.

One of the most fundamental ways in which technology has transformed instruction is not through now-familiar educational technologies such as presentation software, course management systems, or flash drives, but rather by dramatically increasing the accessibility of information. Because of this, effective teaching can no longer focus simply on the transmission of information, but rather has shifted towards the acquisition of cognitive skills for interpreting that information. Classrooms, whether physical or virtual, become the center for learning experiences that are not designed to impart knowledge, but to provide opportunities for application, evaluation, and analysis. In this way, learning spaces become the nexus of design, learning theory, student traits, and technology (Brown, 2005).

If used correctly, technology has the potential to expand learning opportunities and enrich student achievement. The technological tools included in the HHS building are sophisticated and varied, from extensive wireless capacity to accommodate a large number of electronic modalities, to video-capture and video-conferencing capacities, to simulation labs. The building technology infrastructure is intended to prepare students entering the ever changing technology-laden world of healthcare, where tele-health, electronic medical records, and personal digital assistants are common tools being utilized in hospitals and healthcare agencies. In all of these areas, the technology connects students to learning through a strategic re-conceptualization of what constitutes learning space.

The video capture capabilities can be found in the classrooms, student seminar rooms, conference rooms, practical exam rooms and in the clinical spaces. This capability allows content (e.g. faculty lectures, presentations, clinical demonstrations) to be added to web-based or hybrid courses. It can also be used to share content with students who must miss classes or to augment students' learning during planned faculty absences or because of inclement weather. Video capture might also be used to record guest lecturers that are viewed later in subsequent classes. In the health programs video capture is a perfect tool for students to use when assessing/practicing their own clinical skills and it allows faculty to evaluate the students' clinical skills at the end of the course.

Figure 3. Lecture Hall

As shown in the picture of the lecture hall above, many of the classrooms and conference rooms are also equipped with video streaming and video conferencing capacities. Video conferencing technology allows students and faculty to overcome geographical boundaries and to interact and collaborate with experts from around the globe in real-time. This technology can also be used when students choose to share their presentations or demonstrations with their parents and family members who reside in different physical locations. Video streaming content into a number of different physical or classroom spaces might be used when there is not a room large enough to accommodate the number of audience/participants in one physical space.

The HHS Building contains three simulation labs to assist students in the nursing, emergency medical care (EMC) and other health-related programs when practicing their clinical skills using patient simulators. The patient simulators/manikins are used to train students as they practice their assessment and treatment skills on lifelike simulated "patients" without any degree of risk to real-life patients (see Figure 4). The manikins mimic body functions, such as breathing and blood pressure, and allow students to practice CPR, intubation, dress wounds, and collect vital signs such as heart rate and rhythm and oxygen saturation. These new lab spaces have generated much excitement and interest among faculty and students from programs that had not previously

used patient simulators. As a result, faculty are now beginning to collaborate and develop more inter-professional teaching and learning opportunities where students from diverse programs can practice working as a team to respond to situations and health conditions that do not often present themselves during a typical clinical internship. The picture below shows physical therapy and nursing students working as a team during a collaborative simulation exercise.

Figure 4. Simulation Lab

Connecting Space to Teaching

Teaching and learning are two sides of the same coin and so changes in our understanding of how our students learn have produced concomitant shifts in our understanding of how to teach them. Traditional teaching relied on a one-size-fits-all model, with instructors bringing a class full of students along through well-established common goals. Under constructivist theory, however, instructors are recognizing that student outcomes can be more varied, and that students construct knowledge based on such factors as previous experiences, interests, talents, and future goals. Acknowledging this requires a shift towards differentiated instruction, which allows for students to explore multiple paths of learning. Because teaching must be flexible to meet an increasing variety of student outcomes, instructional space, too, has to become more flexible to meet an increasing variety of instructional outcomes.

Architect Prakash Nair calls for the creation of what he calls living architecture through "maximum flexibility and change so that the mix of learning areas - individual, team, small group and large group can be adjusted easily as needs vary" (Nair, 2002). The shape and size of the classrooms in the HHS building were carefully designed to promote flexibility of the learning spaces while also supporting collaborative and active learning opportunities. With the exception

of the 100-seat lecture hall, all of the classrooms are furnished with moveable furniture that can be arranged to support a variety of learning environments, from the traditional lecture style to small, intimate collaborative activities.

The classrooms also present variable technology options, giving faculty a range of options to choose from when requesting the classroom spaces that best fit their individual teaching pedagogies. However, the faculty have not universally chosen to avail themselves of these options. As other researchers have noted, "In academia, as in the business world, one can expect a handful of early adopters to lead the way in using innovative technologies, but, unlike the business world, faculty as a whole are often more risk-averse when it comes to integrating new technology into instruction and research" (Rogers, 1995). While not all of the college faculty fully appreciates the smaller, collaborative room configurations with multiple screens and diverse technology options, others have embraced these spaces and are using them in increasingly creative ways and with positive results.

Often times there is an underutilization of technology in the classrooms when there is a lack of support for faculty development in instructional design (Cuban, 2001). Fortunately the college has access to the Coulter Faculty Commons (CFC), a teaching and learning center that supports instructional and faculty development. Prior to the fall semester and during the first few weeks of classes one of the CFC instructors facilitated several instructional sessions designed to teach faculty how to use the basic technological tools in the classroom. Additional instructional sessions are planned to support faculty who want to use the more sophisticated technology related to video capture and video conferencing.

Having fulltime technology support in the building is imperative to faculty's successful and continued use of technology in the classroom. Through the strong advocacy efforts of the college dean as well as lengthy negotiations with the chief information officer and university administrators, the college was able to ascertain the resources to support two full-time informational technology (IT) positions dedicated to the HHS building. Although the two positions overlap, one position is meant to support the faculty and students in the classroom while the other position supports video conferencing and oversight of master control. After a few months in the building, it has become apparent that as the use of the technology and video conferencing increases, so will the needs for additional technological support. While traditional teaching is primarily the parvenu of instructors, the innovative use of learning spaces broadens the community of support for teaching and learning.

An academic building project often involves a blending of very different cultures and perspectives between informational technology staff, space designers, and academics, each who bring in varying levels of expertise as it relates to student learning. Thus it is imperative to provide adequate education for those outside of academia to ensure that they understand the space and teaching/learning vision of the building all of the way through the project. It is advisable to comprise an agreement from the beginning of the project stating that the academic dean or his/her representative is consulted on all decisions regarding changing the structure and space of the building. For example, any decisions related to "value engineering" (e.g. budget cuts) of building spaces or furniture should vetted through the academic representative so that s/he can help to prioritize these changes to minimize the negative impact on student learning.

Connecting Space and the Community

Starting with MIT, institutions that have embraced built pedagogy are providing a wealth of resources, including advice, lessons learned, and best practices. One of the revelations that has arisen from these early adopters is the idea that a university is not just a site for learning, but can also be an important liaison for engagement with the community. As Wedge and Kearns (2005) emphasize, institutions that are looking to incorporate learning theory into design also need to take their institutional missions into consideration when creating space. WCU was deeply influenced by the stewards of place model championed by AASCU (American Association of State Colleges and Universities) (AASCU, 2002), which calls upon public institutions to be better neighbors, to re-imagine their relationship with local communities, and to become key players in community development (Mayfield, 2001). WCU's efforts to integrate the mission of the university with regional development led to an "engaged institution" designation, bestowed by the Carnegie Foundation.

The HHS Building design is aligned with the university's Mission Statement which emphasizes the values of improving individual lives and enhancing economic and community development through engaged learning opportunities. For example, the learning spaces throughout the building are intended to enhance the professional and clinical knowledge and skills of the students who will be providing healthcare services to the citizens in the region and beyond. The clinic spaces on the ground floor are available to support needed clinical services to the community while providing engaged learning opportunities for students. The Speech and Hearing Clinic is run by WCU faculty and staff and students enrolled in the Communication Sciences and Disorders program. This clinic provides over 2700 sessions annually, many of them at low or no cost to the patient. Two current clinical activities include a support group for patients and families dealing with dementia, and a social skills group for children with autism. Other developing specialized clinics include a fall and balance clinic, aquatic and other rehabilitation clinics and primary care clinics, with a focus on underserved and underinsured patients.

At WCU, recent strategic planning efforts had identified five core areas of community demand, including both education and health care to which the university wishes to respond.

Learning spaces can often serve as conduits for being a good neighbor and, as one researcher states, "higher education institutions are finding out that community and business partnerships are good for business and good for learning" (Nair, 2003). As part of WCU's Millennial Initiative which encourages private/public partnerships, the university is partnering with the local hospital system to relocate their physical therapy sports clinic to the new HHS Building. This clinic will continue to provide physical therapy services to university athletes and community members while creating engaged student learning opportunities through student shadowing experiences and internships and by partnering with students and faculty on research initiatives. The clinic staff will become affiliate faculty who can serve as guest lecturers in appropriate classes and/or partner with the WCU faculty to provide continuing education opportunities for working professionals. Though its use of space, the HHS building and the developing millennial campus links academics with the community, to the betterment of both.

Connecting Space to the Marketplace

Economist Richard Florida has gained international recognition for his theories about the rise of a creative class, and how the needs of this class will dictate new ideas about geographic space. Already a significant economic force, the creative class, Florida predicts, will continue to grow exponentially within the American economy over the next fifty years. Included in his conception of the creative class is the concept of creative professionals. Creative professionals, according to Florida, may be defined as those who "draw on complex bodies of knowledge to solve specific problems" using higher degrees of education to do so (Florida, 2002). Such professionals are largely clustered in key areas that require intensive knowledge backgrounds, such as education and health care. While Florida's work certainly has its critics (Peck, 2005), his conception about a changing connection between economics and geography, or space, has entered mainstream discussions. According to his model, the creative class will be motivated to learn, live, and work in different places than the working and middle classes before them. Instead of moving to a place just to hold a job, creative professionals will seek places that foster the creative process and the lifestyles, both inside and outside of work, that support them. Florida calls upon cities looking to attract members of the creative class to be cognizant of their "people climate" and to invest in options, amenities and surroundings that appeal to well-educated, creative professionals.

Following this theoretical bridge, just as cities should invest in the full lifestyle options if it wishes to attract creative professionals, universities that wish to attract future creative professionals to its doors should pay attention to its people climate as well. A university campus, particularly one that is the dominant employer in a rural area as WCU is, often serves the role of a small city. For such a university, paying attention to the people climate in design can serve to recruit and retain students, as well as talented faculty and staff to support those students. And universities need to pay attention. Faced with declining state support dollars, many public universities are finding themselves having to think more strategically about what programs they invest in and to be more market savvy in competing for and attracting students with the highest chances for success in focused areas.

Like most universities, WCU is cognizant of the value of recruiting and retaining top students, faculty and staff, and WCU has successfully completed a number of new building projects and renovation spaces on the main campus to help them meet this goal. The HHS building, which is located approximately a mile and a half from the main campus, has additional features that are certain to attract additional faculty and students to this area. For example, the building has silver LEED (Leadership in Energy and Environmental Design) certification, resulting in a great deal of shared, natural sun light flowing throughout the building. The large, open atriums, the rooftop garden filled with native and healing plants and the state-of-the-art labs and technology are all attractive features for potential students and faculty.

Even in challenging economic times there continues to be a plethora of job opportunities for students majoring in the health professions. Health-related jobs grew by 54% between 2000-2010 overall and professions in allied health showed a 61% increase (Bureau of Labor Statistics). According to the Occupational Outlook Handbook distributed by the Bureau of Labor Statistics, projected employment opportunities in the health disciplines over the next ten years are expected to grow much faster than the average (e.g. physical therapy, athletic training, emergency medical

technicians,) or faster than the average (e.g. nutritionists, registered nurses, speech-language pathologists, social workers and substance abuse counselors) in comparison to other professions (www.bls.gov). In response to the demand, student enrollment in the college has increased around twenty percent over the past five years. In addition to the using the enhanced physical spaces, the college is exploring additional ways to use technology to support the needs of the healthcare market by increasing its online degree and certification options (e.g. RN to BSN and Nurse Educator programs) and through its use of video conferencing to engage working professionals throughout the region.

Conclusion

This paper has addressed five ways in which a space can be connected to learning, students, teaching, community, and the marketplace, through the lens of a real world application, via the newly-built Health and Human Sciences Building at WCU University. The experience of the faculty and administrators at WCU suggests that bridging the gaps between theory and application provides both challenges and opportunities. Creating innovative learning spaces provides challenges both in design, particularly finding common ground among previously disparate groups of educators, architects, and support staff; and in utilization, particularly finding ways to maximize the potential of innovative spaces for teaching and learning. Creating effective learning spaces provides opportunities to expand how, when, and where students learn and to engage students, faculty, staff, and community in meeting the demands of a dynamic marketplace. The full promise and potential of WCU's new HHS building will only be realized as the building, and its occupants, continue to evolve but the intentional connections inherent in its design leave it well poised to meet diverse and growing needs in health education.

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Disclaimer

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Inter-cultural Awareness and its Role in Enriching Students' Communicative Competence

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Abstract

Globalization and technological advancements are breaking down barriers and borders with vast implications for education in general and foreign language teaching in particular. More than ever, our programs need to address internationalization and cross-cultural understanding. Contemporary language classes must account for features far beyond just the linguistic. They must incorporate the larger cultural fabric of which language is only a part. There is a developing consensus that it is important to include culture learning as part of language learning with a primary goal of making students aware of alternative ways of interpreting personal and social experiences (Sellami, 2000).

The paper will focus on the application of the above principle through an international partnership called the "Connecting Classrooms Project." The project goals include promoting students' cultural/intercultural awareness, clarifying cultural identities, and challenging preconceptions. Students examine the inter-relations among language and other cultural expressions. American students who are studying the Russian language interact through videoconferencing and social media tools with a classroom of students in Russia. Together they work on projects that increase their understanding of the language and culture of the target language and so, build a richer appreciation of their own culture.

The cultural experiences that students go through enable them to become independent learners and open the scope for them to be novice researchers who are capable of using research tools and resources to find information on culture-related issues and topics. It also helps them develop a high level of thinking through analysis of material, reflection, and evaluation.

Keywords

Cross-cultural understanding, cultural/intercultural awareness, language, globalization

Introduction

In the last three decades, language teachers have come to see language learning as being embedded in a sociocultural context. Students are routinely expected to develop cultural

competence in addition to language learning (Fenner, 2008). On the other hand, language can condition cognitive processes and varies according to geographic location. In addition, language is the vehicle by which social experiences of a people are carried down across generations (Vegas-Puente, 1997). Language learning is a case of learning symbols and systems of codes but is as well a matter of developing cultural knowledge and competence. In fact, culture can be viewed as being a feature of language itself. (Kramsch, 1993, cited in Fenner, 2008).

With the vast implications of new phenomena in the world, such as globalization and technological advancements that break down barriers and borders, the aims of foreign language teaching and learning have now expanded to include promoting and fostering the understanding and acceptance of other cultures. There is a growing consensus that the task of language teaching must include culture learning as a part of language learning, thus expanding the ways that students can understand their world (Sellami, 2000).

Research categorizes the goals of teaching the target language culture as part of the language class into two main categories consisting of pragmatic goals and educational goals (Byram, 1997, Planken and Korzilius, 2004). Pragmatic goals include having a cultural component which helps students to communicate successfully with other speakers of the target culture using the target language; helping to eliminate the notions of negative interference and transfer of stereotypes about the target culture, helping students socialize with other speakers of the language, both native and non-native; helping arouse students' motivation and interest in the foreign language as they "relate the often abstract sounds and forms of a foreign language to real people and places" (Fenner,2008); and helping prepare learners for the future by reducing the element of culture shock for students who go to study abroad. The educational goals of teaching culture include the acquisition of a wider world-view and learning to be open, accepting, and caring citizens of the world community. Encouraging positive attitudes and understanding of other people that could ultimately lead to tolerance, the overcoming of stereotypes, and the reduction of prejudice and ego centricity are other educational goals.

Another major development in the literature on culture and its incorporation in the foreign language class is the introduction of the term "intercultural" to replace the term "cultural". How we view cultural understanding within the language class has evolved from an understanding of the "target culture" toward an understanding of how two different cultures are related (Fenner, 2008). When students learn and internalize a new language and its new culture they do not work in a vacuum. Indeed, their beliefs, values, and assumptions shape their understanding of themselves and their understanding of others. Students are embedded in the cultural context of their home society, and this contextual embedding lets students use this knowledge to interpret the meaning of linguistic information of the target language. Furthermore, learning about another culture prompts students to reflect on their own culture. Students' local culture is their starting point and what students learn in the process of learning a foreign language goes back to the students' own culture.

The present paper draws on a number of principles of involving intercultural awareness and competence. Interest in cultural competence arose naturally from the experiences of Westerners doing business overseas. That interest has grown with the growth of international business and has also been affected by the popularity of study abroad, and by the needs of expatriates living overseas (Sinicrope, Norris, and Watanabe, 2007). Researchers and practitioners now routinely

assume that language learning and developing cultural competence are interrelated. (Byram, 1997, Planken and Korzilius, 2004). In Byram's view (Byram, 1997), foreign language courses should not only teach students the language needed to communicate but also make them encounter another culture and perceive it in its own context.

Literature Review

Intercultural awareness is the development of awareness and understanding of one's own and other cultures. Intercultural awareness occurs when people no longer assume that their culture's way of looking at things is the best way or the only way, and when people therefore begin to evaluate other perspectives (Yassine, 2006).
There is more to intercultural awareness than merely acquiring facts about another culture. Chris Rose (2004, cited in Yassine 2006), lists observing, identifying and recording elements in both the home and target cultures, comparing and contrasting, negotiating meaning, dealing with or tolerating ambiguity, accepting difference, defending one's own point of view while acknowledging the legitimacy of others, and not limiting the possibility of interpretation as necessary skills and attitudes for heightened intercultural awareness.

One of the most well-established models of intercultural competence was developed by Byram in 1997 (Sinicrope, Norris and Watanabe, 2007). Byram proposed a five-factor model of intercultural competence (Byram, 1997, Chapter 2): 1) The attitude factor which refers to the ability to see oneself in relation to others, 2) knowledge about one's own and other cultures, and in addition knowledge about the process of social interaction, 3) the skills of interpreting and relating, 4) the skills of discovery and interaction, and 5) cultural awareness which describes the ability to use perspectives, practices, and products in one's own culture and in other cultures to make evaluations.

Intercultural competence involves raising the learner's awareness of their own culture as well as raising awareness of the culture of the language being learned. Learners are often asked to reflect on aspects related to their own culture and the target culture as they look at differences and similarities and explore areas that are often taken for granted. This will ultimately help to clarify what is deepest and most relevant to their identity (ibid, 2005). Students gradually develop an awareness of themselves and how they relate to those who are from the other culture, the "other." With the right choice of activities, the foreign language classroom can help learners turn their attention back to their lives and discover certain aspects in which they can take pride.

Learners are very active agents in the learning process; the focus is on them, what they can bring into the classroom, and what they can take out of it. Learning about the target culture is redirected towards a more concerted hands-on experience learning approach where the learner engages in a discovery process of both the target and home cultures and their ways of life (Sellami, 2000). The learner, in the process, does not only learn a foreign language but also develops as a person and as a member of a larger community. Incorporating intercultural awareness in the foreign language class can and should promote developing awareness of the learner's own identity, (see Fenner, 2008) and thus personal growth. The personal growth is a product of enabling students to reconcile their own beliefs with ideas from the culture of the "other" that may be very new and challenging (Porto, 2009).

According to Straub (1999) as cited in Thanasoulas (2001), learners need to be provided with some kind of meta-language in order to talk about their culture and "to cultivate a degree of intellectual objectivity essential in cross-cultural analysis." Critical thinking skills are developed when students are forced to confront the foundations of their own culture as they relate to the foundations of the culture of the language being learned.

English/Russian as a Foreign Language in Russia and the USA

Given the prominent role English has gained in the last century, especially in the worlds of science, advanced technology, and communication, it has become an international language and a lingua franca used by an increasing number of people in various fields of life all over the world. To further discussion of the role of culture in learning a foreign language, it would be beneficial to understand current practice of teaching English as a foreign language in the Russian educational system. Teaching and learning English have become a necessity in Russia where the aim is to develop the social and economic lives of the future generation. In Russia, English plays a very significant role in the economic and social life of the country. Since the beginning of the nineties, after the collapse of the Soviet Union, the knowledge of the English language helped one keep abreast of the developments taking place in other parts of the world. Russia began a process of industrial, trade, and financial activities where the use of English is indispensable. English is now widely used in almost all sectors of life. In its institutionalized form, it is used in mass media, business, and education.

Since the introduction of a modern system of teaching foreign language in Russian education in the 1990s, English has been designated as the main foreign language in public schooling. English is now taught as a main school subject in all public classes from as early as the first grade in specialized schools and the fifth grade in the public schools. This allows Russian students to study the language for a total of six years before embarking on their higher education. In higher education institutions, English is the medium of instruction for most science, technology, and commerce-based specializations. In the society at large, English is exerting an increasingly important influence on all aspects of Russian society and its development. Knowledge of English is now an essential prerequisite for obtaining employment in many different types of jobs in both the public and private sectors, and it helps open the door for a higher position in society in general.

English language teaching programs in Russia show the uses and values of using English in the Russian society as perceived by his participants of university graduates, English language teachers, supervisors, and school principals. Four main uses are identified. First, English is seen as the prime medium of international communication and is the tool that bridges the linguistic gap between the different parts of the world. English can facilitate international integration, understanding, and cooperation. Second, English is vastly acknowledged as a bridge leading to good employment, a better future, and a better life. Third, English is used for academic purposes. It is the main medium of instruction in most higher education institutions that often require students to have gained a certain level of proficiency in it as a condition for admission. Fourth, English is also perceived valuable for enhancing cultural analysis and understanding. Moreover,

Russian education leaders believe that English is a powerful tool for transmitting and accessing culture and knowledge and for opening doors of modernization and understanding.

At the school level, the English curriculum in Russia is based on a communicative syllabus as well as a content-based syllabus that has cultural material related to both Russian and English speaking countries. One of the main objectives of the textbooks prescribed by the Ministry of Education is "to encourage students to develop a positive attitude towards and take an interest in their own and different cultures and peoples" (Ministry of Education and Science Bill, zakonoproekt2012).The investigation of English as a Foreign Language (Russian EFL) teachers' perceptions of cultural aspects in Russian EFL textbooks reports that teachers identified the following aims for the incorporation of cultural material: expanding learners' understanding of the world, motivating learners to learn more about other cultures, developing a positive attitude towards other people and their cultures, raising learners' awareness of other cultures, developing learners' understanding of their own culture, identifying similarities and differences between Russian culture and international cultures, and developing learners' language ability to reflect critically on the cultural issues identified in the material.

In contrast to Russian educational methodology with respect to teaching English, the teaching of Russian as a foreign language in the United States has a completely different history and is still trying to find its place as one of the critical languages in the list of languages taught in the universities and high schools. Over the past several years, the study of Russian in American universities has grown from merely 23,921 students in 2002 to 26,883 in 2009, an increase of 12%. It remains difficult at the university level and nearly impossible for K-12 students to find offerings in Russian language instruction. Even when Russian language instruction is offered, the majority of the textbooks available for use in teaching Russian as a foreign language are based on a communicative method with only modest presentation of cultural information; this current practice does not as yet serve students well.

At the University of Central Florida (UCF), the Russian program at the intermediate level includes a project called “Connecting Classrooms” that has enhanced both the students’ cultural and intercultural awareness and their sense of pride in their cultural identity. The mission of the project is multidimensional as it aims at combining language instruction with real experience to foster meaningful social, cultural, and personal learning. Some of the goals of the project can be stated as follows:

1) To improve students’ proficiency and communication skills in Russian, especially oral skills
2) To increase student motivation and interest in improving their language skills by providing them with opportunities for student involvement and “ownership” of their learning
3) To encourage mutual respect and openness to different ideas among both Russian and American students

As part of the Russian class at the University of Central Florida, students work closely with students from Lyceum #7 in Novocherkassk, Rostov-on-Don, Russia (mainly via email correspondence and Skype) on collaborative curriculum projects. For the past two academic

years, partnerships in which the same group of students from both participating schools (UCF and Russian) work on a variety of joint projects have taken them outside the boundaries of their classrooms and involved them in a discovery process about themselves and the other students with respect to language, culture, and society. The activities and examples presented and described below in Table 1 are based on the experiences of the two schools. Both schools use the principal of international project methodology. More on this may be found in Kourova (2013).

Table 1. Project Preparation and Overview

1. Discussing the project idea, problems, the goals of the projects	Both teachers presented the cultural information and the connection between cultures and explained what the students had to do.
2. Discussing specific activities	Both teachers presented specific information about the foreign educational system, geographical location, and cultural mores and gave the details of individual assignments.
3. Preparing for students' analysis of interaction	Both teachers prepared brainstorming activities for use during the project.
4. Encouraging students' independent communication and research	Both teachers encouraged and supported students' independent communication through e-mail and Skype, their work, and their research. Practicing face to face communication as preparation for individual activities occurred.
5. Supervising the students' progress	Both teachers consistently monitored students' progress during the project.
6. Evaluating mid-project progress	Both teachers and the students evaluated their project to that point in terms of strengths and weaknesses.
7. Preparing for the final Skype interaction	Both teachers helped students to develop the content and structure for the final semester Skype interaction.
8. Conducting the final Skype conference	Both teachers explained proper attire and demeanor to their students.
9. Assessing the project	Both teachers together with their students assessed learning outcomes.

Year one

The first year is called "Breaking down Barriers". This is the year when students from both countries get to know each other at personal, institutional, and cultural levels. Students exchange letters, e-mails, videos, and CDs including information about themselves, their hobbies, families, villages, subjects and educational systems at their schools as well as different aspects of their cultures. Parcels containing letters, gifts, and artifacts are exchanged. In their classes, students examine the contents of the parcel, discuss it, and express opinions. This process continues for

some time, as parcels are exchanged at least three times throughout the semester. This is then followed by an evaluation stage where students analyze and discuss what they have learned about each other and give short presentations.

Year two

In the second year of the project, students work on a multi-disciplinary range of subject-specific projects. In their classes, one of the most pioneering projects is students' work on the collection, translation, and writing of folktales from their local villages. Students engage in the research process as they interview older members of their local cultures and listen to folktales. Students compile these in the form of a booklet and also use them as a basis for creating their own original stories. Each participating school creates a book of both traditional stories and stories received from the other school as part of its permanent display of student work. A copy of this book is exchanged with the partner school. In the class, students analyze different aspects of the American traditional stories and identify areas of similarities and differences between them and the folktales sent from Russia.

Participating students also make drawings depicting different elements of their culture, such as festivals, architectural designs, clothes and jewelry, Russian and American customs and traditions. These are sent together with samples of a variety of artifacts that represent both Russia's and America's rich cultural heritages to the partner school. Participating in the project has also encouraged students to address some very important environmental issues such as climate change, recycling, and pollution through the medium of both the Russian and English languages. With the help of their teacher, students develop questionnaires including items they would like to investigate regarding the geography and environment of the partner school. Items cover areas related to climate, life style, and geographical and demographical features. Students' research results in the creation of a local school newspaper or a radio report that is broadcasted through local media venues.

Discussion and Conclusion

The main premise of this paper is to demonstrate, through the presentation of one example of a class project, how the teaching of English as a foreign language in Russia and teaching of Russian as a foreign Language in America can help students learn not only about other countries and their cultures, but also open their eyes to their own local culture and promote their sense of identity and pride in its rich cultural heritage. The present example of a join Russian-American class project describes how students can gradually develop an awareness of themselves and their own culture by being made to engage with a culture that is unfamiliar to them. In the process, students develop an understanding of the target culture and they develop positive attitudes toward the target culture. They learn that there are multiple ways of perceiving matters and understanding them and, most importantly, they learn that their views and those of their local culture have a large impact on their lives.

The literature detailed in the present paper outlined the connection between foreign language learning and identity construction and highlighted the inextricable relationship between the two. In this join Russian-American class project, learners are encouraged to play multiple and

different roles drawing on their varied and rich cultural backgrounds and experiences. In the process, students become aware of the context of their cultural experiences and engaging with another culture helps students make the connections to their own cultures conscious. In a similar vein, their foreign language learning experience and exposure to the target culture(s) helps them understand what it means to be part of a culture, be it their own local one, regional one, or the global culture at large.

An important benefit of enriching cultural experiences is that students develop the skills to do their own research on cultural topics. The level of student thought is enhanced by the experience of having to discover, analyze, and make judgments about cultural materials.

Project Connecting Classrooms helped students not only bridge the chasm between people separated by differences in cultural background and see what is they have in common, but also brought them closer to the richness of the variety of their own local culture. It goes without saying that the onus is on teachers to help create atmospheres that encourage dialogue, curiosity, and openness in their classrooms.

Project Connecting Classrooms is an example of how interaction with target-language students can give students enriching opportunities that become part of the fabric of their cultural understanding. Right from the beginning, students develop friendships with their target culture peers and write to them explaining aspects related to their own cultures. In order to gather information, students engage in a search process in their local environments by doing activities that bring them closer to their culture and its rich heritage such as investigating museums and forts, seeking stories and legends, taking photographs, and making drawings.

Project Connecting Classrooms does not only benefit its participating students and teachers, but also benefits the whole local community by spreading greater social cohesion. Young people develop an understanding and appreciation for the "other" but also, and of equal importance, they become more aware of their own culture and their place in it.

This academic article was considered by the HETL 2013 International Conference Selection Board and was accepted for publication in the conference proceedings after a double-blind peer review involving three independent members of conference Review Board.
The results show that the students performed at least as well in the blended course as in the traditional POGIL course. Based on anecdotal evidence, blended learning did help students to adapt to a cooperative learning strategy. There appeared to be no student resistance to the teaching strategy in the blended course, and the perception problem sometimes observed in POGIL classes did not occur.

The blended POGIL classroom was more efficient and economical of face-to-face time than the traditional POGIL classroom. Time usually taken to address confusion and refocus students in a normal POGIL course was spent covering additional material. Teachers often complain that student-centered instruction is too time consuming and that not enough important material can be included in an active learning syllabus. The blended classroom appears to be, at least, a partial solution to this problem.

Many students become disengaged as they perceive active learning to be difficult and confusing. This is compounded by a common perception that science is dry, boring, and irrelevant to student's lives. The results of this study show that good student engagement can be maintained in a blended POGIL class.

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Appreciative Inquiry - A New Dimension in Problem-Based Learning

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Abstract

This research study suggests that there are limitations to the traditional problem-based learning (PBL) model and recommends the introduction of appreciative inquiry (AI) as an innovative and contemporary addition to PBL. Proponents of AI suggest that instead of looking for problems and aspects of a scenario that does not work or is problematic, that students first look for the strengths and the more affirmative influences inherent in a problem situation. This results in students approaching a problem with a more appreciative and value-adding outlook. Approaching a problem with this new approach allows students to look much more holistically at the situation in question. By introducing the AI dimension, this enhanced model of PBL was shown to have a positive impact on the students' learning and experiences, and ultimately in their clinical and social care practice as occupational therapists. The study used a qualitative phenomenological approach, and based on the nature of the research problem, an interpretative phenomenological analytical approach was chosen using semi-structured interviews with eighteen PBL experienced tutor facilitators with at least three years of experience with the AI pedagogy. The study showed that there was extensive concern amongst the tutors that a perceived over emphasis on problem solving on behalf of the students adversely affected their creativity in their learning experience.

Keywords

Appreciative inquiry, problem-based learning, healthcare education, occupational therapy

Introduction

In this paper, the author examines the incorporation of the principles of appreciative inquiry (AI) into problem-based Learning (PBL) as a means of providing a more effective, client-centered approach to problem solving in a variety of healthcare educational and practice settings. PBL is described as 'an approach to structuring the curriculum which involves confronting students with problems from practice which provide a stimulus for learning' (Boud & Feletti, 1997, p. 15). PBL is predominantly carried out through small group work where chosen problem scenarios or case studies are presented to students with an expectation that learning needs will be identified, with subjects delegated to group members where responsibility for researching and sharing knowledge is put back onto the student group. The focus and expectation are often on the outcome being a solution to a problem solved collectively by a team. PBL as a pedagogical approach to healthcare education is described as an "apprenticeship for real-life problem

solving" (Stepien & Gallagher, 1993, p. 26), and should not be confused with 'problem solving', although many would argue that it will enhance the student's ability to improve their problem-solving skills.

Problem-based Learning and Appreciative Inquiry in a Healthcare Setting

Table 1 outlines a traditional 5-stage PBL cycle from the point of exposing the students to the problem scenario to the point of potential problem solving and evaluation, and illustrates one way in which a student's focus on problem solving is influenced by PBL.

Table 1. Model 1 - traditional 5-stage PBL cycle

Stage	Activity in stage
Stage 1	Trigger/scenario (problem situation) given to the student group **(problem-focused questioning)**
Stage 2	Students identify learning needs and allocate tasks and subjects to be researched using self-directed learning **(problem-focused position)**
Stage 3	Students share knowledge and skills (learn from each other) **(problem-focused position)**
Stage 4	Aim to problem solve
Stage 5	Evaluation

This approach to PBL encourages students to identify the problem, and to discuss the process of working towards a potential solution. Given concerns over the problem-solving focus of some programmes, healthcare educators may need to consider newer and more contemporary approaches to learning and teaching including AI (Whitcombe, 2013; Clouston, Westcott, Whitcombe, Riley & Matheson, 2010). Wineburg (1987) and Murphy, Campbell and Garavan (1999) argue that enhancing learning and teaching can be more rewarding and easily attained by promoting more affirmative perceptions of success rather than failure. Considering AI in the context of a problem-solving approach may be seen as making an innovative, modern and more affirmative contribution to healthcare education evidenced by studies undertaken by Rubin et al. (2011) and Machon (2010). In this context AI as a paradigm is stated to be a "philosophy, a revolutionizing force, a transformational change process, a life giving theory and practice, and even a new world view" (Orem, Binkert & Clancy, 2007, p. 24). It is suggested that a positive aspect of ourselves and our relationships should be a starting point from which we can find a way forward (Kelm, 2005). Based on these principles, AI, a mode of 'intervention' learning and research, encourages organizational development through group discussion and teamwork (Ludema, Cooperrider & Barrett, 2001, p. 189).

Advocates of the problem-solving approach may question whether AI is relevant in the context of PBL. Some may believe that inherent within PBL is an invitation for students to value the strengths and weaknesses presented part of each problem scenarios or case. Evidence within the Rubin, Kerrell and Roberts' (2010) study and the Orem, Binkert and Clancy (2007) literature however indicates that AI may push individuals and groups to be more open and positive in their thinking and actions thus taking a more affirmative attitude towards the scenario in question.

Applying AI skills in this manner therefore may go some way to improving attitudes and behaviors amongst students, to create a more realistic and more client-centered approach to healthcare and ultimately to improve the way in which we equip the workforce of the future to be more positive and inclusive.

In the UK, the nature of healthcare higher education has recently been scrutinized and criticized (Francis, 2010). There are many reasons behind this debate around the need to reform curricula content and the manner in which healthcare programmes are delivered and in particular the way in which certain pedagogical approaches have been adopted. Reasons include the outcome of the widely publicized Francis Report (2010) which outlined evidence gathered by an inquiry into falling standards at English Hospitals. The inquiry highlighted clearly that for many patients the most basic elements of care were neglected, with issues of healthcare workers showing negative, and at times uncompassionate and undignified attitudes towards vulnerable patients. Some of the blame was directed towards university courses which were reported as not adequately preparing future healthcare professionals to take a more positive and affirmative attitude towards their work and to approach their duties with the required depth of dignity, compassion and care.

In response to the Francis (2010) report, it appears that British society has begun to question the manner in which higher education prepares healthcare professionals of the future, and interest in AI's potential may create a new foundation for enabling positive, transformative change in PBL facilitation, students' learning and ultimately in healthcare practice.

Recognizing the Issues - Research

A study by Roberts (2010a) revealed that a significant number of practitioners in the healthcare profession believed that use of an AI/PBL model could be beneficial in most clinical and healthcare work environments. Practitioners reflected on the potential effectiveness of the model in areas such as palliative and end of life care, mental health and stroke rehabilitation.

Study participants expressed concern relating to the perceived limitations of a framework such as PBL which is focused primarily on problem solving. They concluded that students' over dependency on problem solving inhibited a more open and creative approach to their learning and healthcare practice. In a separate eight-year evaluative study of final year students (Roberts, 2010), students reported the problem-solving focus of PBL inhibited creativity of thinking, doing and learning. Students became overly anxious when problems could not be solved thus influencing the way in which they were able to take a more holistic and client-centered approach to professional practice. As a way to influence such limitations, the study suggested the value of promoting the potential use of AI as an added dimension within PBL. AI suggests that tutors may encourage students to consider that which is working well as a first step by using the vision of the appreciative eye (Machon, 2010). Findings which emerged from the study showed that AI as a new dimension may indeed empower students to use this particular mode that maximizes the very best of what it has to offer in order to create a better attitude and behaviors that will encourage working towards a more positively envisioned future.

Some of the study participants expressed concern at the way in which some students perceived their future role as healthcare practitioners. It was suggested that aspiring to be more holistic and

client-centered may be best achieved through a partnership between the collaborative and appreciative approach and the problem-solving approach. In theory PBL provides an opportunity for students to utilize their personal initiative in order to influence the way they approach their learning needs. Using their own experience together with their peer group as a resource, students aspire to refine and allocate the information required to best influence the learning outcome of problem solving. Traditionally and because of its focus on problem solving and by its very nature, PBL creates a learning situation which is objective and analytical that largely sees problems and their solution. The focus on problem solving becomes a ritual and at times may inhibit creativity in the need to seek a solution. Whilst directing their own learning as a way to attempt to problem solve, students are almost forced to take individual responsibility to achieve a positive outcome to the problem. As a way of empowering and inspiring students to participate in the ownership and development of their learning, AI may be seen as complementary because it stimulates inquiry, discussion of ideals, forward thinking and planning.

The Paradox – A New AI/PBL Model

Inherent within the AI framework is the 4D model outlined below (Ludema, Cooperrider & Barrett, 2006, p. 192) which guides students through four stages to enable the process of building on success, affirming ideals and goals, and planning ahead. The four stages of Appreciative Inquiry are:

- Discovery – where the focus is on identifying the most positive aspects of experience;
- Dream – where ideal future development is envisioned based on this experience;
- Design – where participants consolidate plans and ways in which their ideal can be attained; and
- Destiny – plans are put into practice, and continue outside the group discussion.

When considering particular strengths of the 4D model students can reflect and apply the learning gained from their past experiences and successes and relate them to their future aspirations and hopes. It is highly participatory and inclusive and respects different views and values. The results of a 4D process are directly action-oriented as it motivates students to approach the problem with different attitudes and aspirations. The belief within AI encourages students to replicate influences that give attention to, and a more positive response to what is working well. When reflecting on OT education and practice in particular, PBL has been historically used as a method that encourages students to see activity and occupations often through an analytical lens whereas AI encourages a more affirmative and positive outlook. The proposed model in Table 2 illustrates how the traditional PBL model can be adapted to embrace and value the integration of the 4D model.

Table 2. Model 2 - Integrating AI into PBL through the application of the 4D model (Adapted from Cooperrider & Srivastva, 1987)

Stage	Students exposed to the trigger/scenario
Stage 1	Applying AI – students look for what is working, looking at the situation initially with an appreciative eye. Appreciating and valuing the 'best of what is'. ***(new contemporary AI inclusion at the onset – DISCOVERY stage – affirmative questioning)***
Stage 2	Identification of problems ***(traditional PBL problem solving approach – problem- focused questioning))***
Stage 3	Envisioning 'what might be' ***(AI approach – DREAM stage- affirmative questioning)***
Stage 4	Students identify learning needs and allocate tasks and subjects to be researched and analysed. ***(traditional PBL learning needs stage – problem- focused questioning)***
Stage 5	Dialoguing 'what should be' ***(AI approach – DESIGN stage – affirmatives questioning)***
Stage 6	Action plan and intervention ***(traditional PBL sharing of knowledge stage – problem -solving questioning)***
Stage 7	Innovating 'what will be' ***(AI approach – DESTINY stage – affirmative questioning)***
Stage 8	PBL/AI stage – Possible solution and evaluation

It is proposed that AI starts the process from a place of what works at the onset rather than over relying on the need to solve the problem. The model outlines the importance of what questions are asked, the manner and context in which they are asked and the sequencing of such questions when assessing needs. AI invites system-wide dialogue and learning through a process of appreciative interviewing and questioning using the following interaction at each of the 4D stages as an example:

- What's working well now? *versus* what's not working well?
- What opportunities are there? *versus* what are the main challenges?
- What has the patient achieved so far? *versus* what s/he may not have been able to achieve?
- What does the patient find easy to achieve? *versus* what does the patient find most difficulty with?
- What are the patient's aspirations?
- What is the optimum outcome for the patient?

In this sense the AI technique motivates and empowers stakeholders to change their life, situation or organization (Lewis, Passmore & Cantore, 2008). For these reasons, AI is now becoming widely used as a means of educational evaluation. Encouraging negotiation in this manner supports attempts to give collective and organization-wide ownership and authorship of positive transformation. It provides a procedure in which evaluation becomes a collaborative means of improving individual and organizational systems and is negotiated within the PBL

group, not imposed. Therefore, consequential changes are more likely to be accepted by students since they have jointly been involved in evaluating themselves and their learning (Baume, 2008).

When evaluating AI in this manner, Machon and Roberts (2010) showed that the approach invites the student to share in the discovery of the source of yet unrealized potential and growth within the scenario in question and specifically in relation to a patient in practice. They also suggested that, when introducing AI as an added dimension to PBL, the process invited lecturers to engage more fully and on a different and more positive level with the students.

Encouraging students to apply a more appreciative process to PBL from the onset encouraged the unfolding of innovation and creativity in this context. A study by Roberts (2010) revealed that students showed a tendency to overly rely on the pressure to problem solve, often to the detriment of their creativity. Participants in the study overwhelmingly reported their concern that students felt as if they were failures, appearing stressed and anxious when they had been unable to solve a given challenge. When applying AI principles as an alternative, tutors reported that students tended to ask affirmative questions before considering the challenges of problem solving.

In a healthcare setting, affirmative questioning of clients was believed by the tutors to have been overlooked and undervalued as the pressure to solve the problem was immense. The analytical perspective when applied as a primary focus often critically evaluates a situation before progressing to define a possible solution. Questions focusing on problem solving may include a direction such as:

- What is your presenting problem?
- How is the problem weighed against others in your life?
- Does this problem hide a further deeper challenge you face?
- How might you engage in problem solving in a truly client-centered manner?

Applying AI principles in this manner may provide a platform to create a more positive approach to the traditional PBL cycle, resulting in tutors encouraging students to move from a focus on problem solving towards a more appreciative one. One potential danger in focusing on the problems was the students' preoccupation with problem solving, finding the answer which limited a more holistic and realistic vision of the problem scenario and/or client. It was reported that tutors observed a pattern where students aspired to want to learn from mistakes by focusing on what they did wrong. What needs to be remembered in a healthcare context is that such professionals naturally aim to problem solve. The main challenge here is such an approach through PBL may at times hide the crucial need to not see and treat patients as merely the problem with which they present. This may be perceived by patients as students' (therapists') devaluation of the educational role of those who seek their support and intervention. These are questions that are key to students' better understanding and value placed on a more holistic and sustainable client-centered practice.

Evaluating the AI/PBL model

Rubin, Kerrell and Roberts' (2011) study of occupational therapy (OT) undergraduates indicated additional concerns and limitations in relation to the PBL approach. When interviewed, students perceived the PBL approach as being restrictive in nature, encouraging an approach with a one-dimensional vision through an analytical lens. This lens was experienced as being overly critical, encouraging students to limit their observations of the world of teaching, learning and practice experience purely as one of problems needing to be solved. Employing only the analytical eye, one that focuses excessively on problems, resulted in students concentrating excessively on the need to find more problems to be solved. Rubin, Kerrell and Roberts (2011) question whether this focus may well be inhibiting the opening of a more valuable learning experience, that of seeing patients in a more realistic and holistic way. A potential danger expressed by Cloke and Goldsmith (2003, p. 180) is that "in thinking that we know the one correct answer and in deciding to enlarge our ego, we do so at the cost of reduced skills in the person who has to live with the result". This is not meant to deny the great value of the practical, scientific and focused technical expertise required of a healthcare student or practitioner to problem solve.

The study by Roberts (2010a) recognized that tutor facilitators tended to direct students to health-related problem scenarios as a way to acquire problem-solving skills. Some participants expressed concern that students showed tendencies towards labeling individuals by diagnosis. Focusing on diagnosis in this way tended to limit students' lateral thinking and their willingness to be creative in client centered manner. One tutor expressed her own anxiety in relation to the problem-solving focus of PBL. From personal experience of working in mental health she believed that therapists may not at times be able to solve the overarching problem, but simply facilitate the individual client to live a meaningful life with the problem.

Six tutors described the manner in which they had negotiated the introduction of AI into the curriculum as a means of changing students' behaviors and attitudes. In addition to sharing their experience in areas such as mental health, one tutor described how attitudes in palliative and end-of-life care environment were often dominated by a negative outlook. She had to remind students that often in such environments individuals will be positive about leading a full and affirmative life as they deal with their illness. In a hospice setting it was reported that students on clinical placement were seen to focus excessively on the dying, seeing individuals through a very critical problematic lens. Applying a more appreciative eye in this context encouraged students to take a more empathetic, positive and holistic view. One tutor summarized her experience in that AI had guided the students in a more creative way to think more positively, in an appreciative and different way from what she was used to. Seven of the tutors interviewed advocated that AI should be used in PBL because problem solving seems to be an overused method for effecting change and students should begin to explore what gave life to people when they were at their very best. With this in mind, should tutors and students dare to ask questions about hope and inspiration and begin to see people not as problems to be solved but miracles and mysteries to be embraced? A number of tutors stressed the importance of the need to be aware of their own personal positivity as a platform to create more powerful social experiences to help students discover the best about themselves, how they saw patients, team working, the group process and indeed their place within society. The expression of the constructivist principle may be fundamental to ensuring that students moved towards an appreciative perspective of themselves and their situation, that tutors and students moved toward adoption of a more appreciative language in speaking about PBL scenarios and group process and that they build a more holistic

and balanced view of themselves. In this context, PBL may be seen as an approach that has limitations which cultivate in the student (and therapist) an analytical eye that seeks largely to identify problems and determine their possible solutions.

With tutors and students expressing similar concerns about a perceived over-emphasis on problem solving within PBL, evidence is emerging that may indicate a desire to consider an alternative complementary level of intervention to the process, that of AI.

Drawing Conclusions

Respecting the vast experience of the study participants and their reflections on PBL, healthcare education may be going through a renewed period of revision. If tutors and students alike believe that the problem focus may devalue the patient's experience which in turn may limit their own creativity, then considering AI as an added dimension to PBL may offer an innovative answer to their concern. When a health practitioner can look at a problem situation through an appreciative lens a more holistic and client-centered approach may be achieved.

Whilst the apparent limitations of the traditional model of PBL cycle are not in its process of problem solving but more in its context and vision, the analytical eye critically and objectively sees the world of teaching and practice as problems to be solved. Roberts (2010) suggests that the nature of the students' learning and clinical practice and the context from which they view the intervention in essence define the outcome that they find. Through effective teaching, support and group facilitation, tutors can guide students to suspend these habits, and to approach PBL with a more affirmative and open mind and heart. Such a platform may well equip students with the capacity to see patients with fresh, inquiring, and reflective eyes. It is proposed that AI is a fundamental component of this platform and it may enable students to navigate difficulties not from a place of anxiety to solve, but from a place of enthusiasm and excitement to be innovative and creative.

Recent years has seen AI emerge as a contrasting approach to organizational development work, one in which intervention gives way to inquiry, imagination and innovation. In healthcare education, AI intervention such as the discovery, dream and design phase contrasts with negation, criticism and spiraling diagnosis. AI offers as its strength what PBL has as a limitation – the two appear to be naturally complementary. Cooperrider and Whitney (2005, p. 8) believe that AI "involves the art and practice of asking unconditionally positive questions that strengthen a system's capacity to apprehend, anticipate and heighten positive potential". In contrast to judging situations through an analytical lens, AI instead may cultivate an 'appreciative eye'. Healthcare students and practitioners develop highly valued problem-solving skills and knowledge by the very nature of their work. Within PBL, pressure to identify problems and develop a structured plan to solve them has historically dominated its application as pedagogy in higher education. Looking at both AI and PBL places them on polarities of a continuum, one positive, the other negative, seeing challenges as an opportunity and not as a problem. The opportunity has arisen to present an alternative and innovative model that embraces both AI and problem solving. The more positive the question students ask, the more long-lasting and successful the change effort. The most important thing a healthcare students can do that makes a difference is to ask each other, themselves and their clients more unconditional positive

questions. The research indicates strongly that tutors and students alike need not be hesitant about introducing affirmative language more carefully and prominently into their learning and practice. Approaching PBL with such an appreciative eye will go some way in providing students with a learning platform which is more positive, creative, holistic and person-centered and arguably a more realistic approach to healthcare education and practice.

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