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INTERDISCIPLINARY PBL COURSE DEVELOPMENT IN HIGHER EDUCATION

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The element of discovery has always been a vital part of the learning process. It is a key component of how people learn. Yet studies indicate that although a large percentage of faculty in higher education regularly use problem-based learning (PBL) to some degree, most either use it very little of the time (Wurdinger, 2016), or as a superficial way to acquire predetermined knowledge (Hüttel & Gnaur, 2016), with a focus on the irrelevant acquisition of knowledge rather than the active production of knowledge (Szulevicz & Jensen, 2013). Current studies indicate that there is a specific need for research studying the effective pedagogical design of interdisciplinary PBL learning that applies knowledge in real world contexts (Franks et al., 2007; Stentoft, 2017).

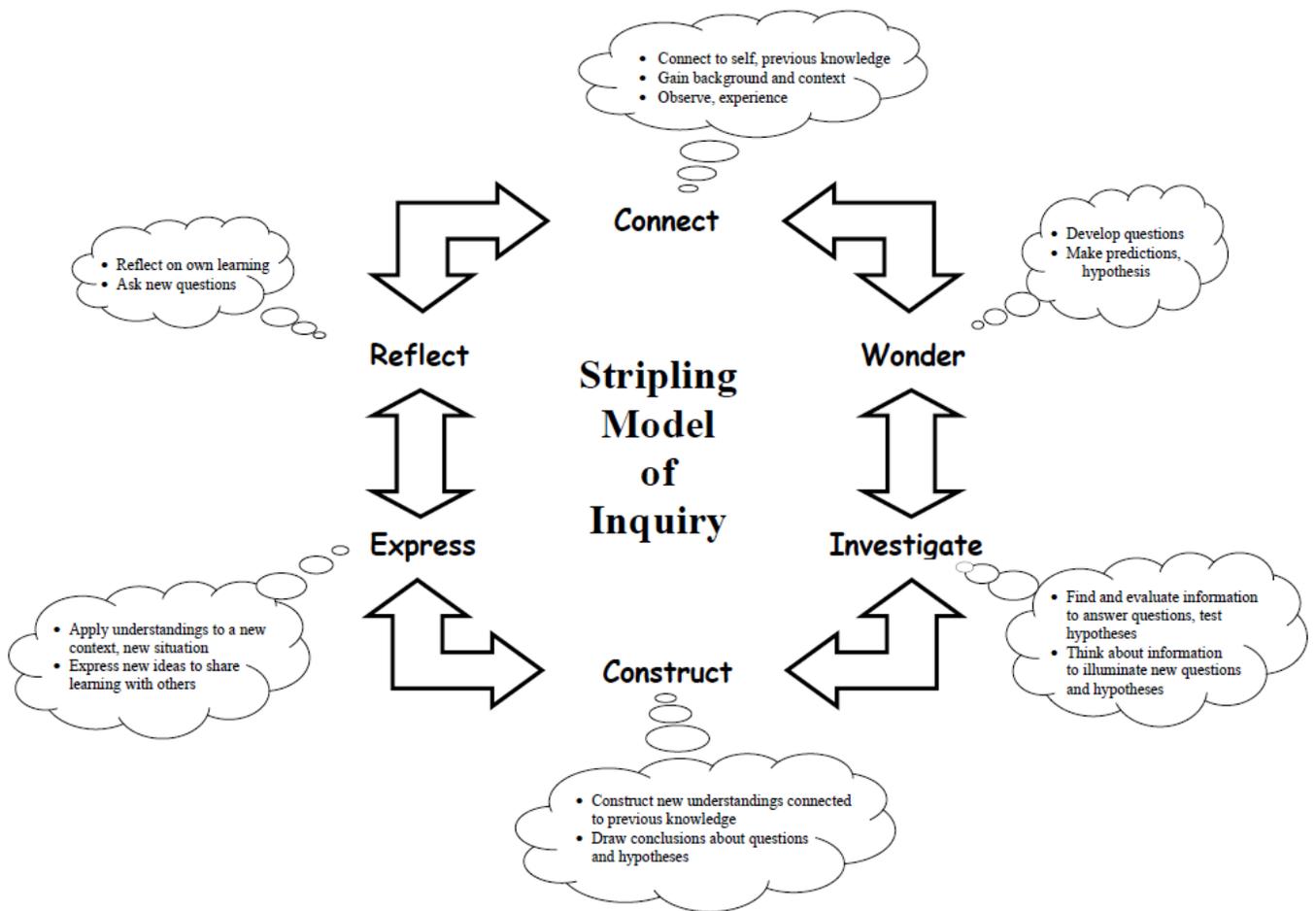
Purpose and PBL Model of Inquiry

The course examined in this case study utilized an interdisciplinary PBL learning approach that is anchored in constructivism, the view that ‘...knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social contest’ (Crotty, 1998, p. 42). The purpose of the study was to understand how a PBL graduate education course could be organized in ways that utilize the current knowledge of how people learn within diverse, real world community settings.

Problem-based learning approaches date back to John Dewey’s (1938) work on the relationship between experience and the learner. They are also strongly influenced by the work of a plethora of educational theorists such as Piaget, Lewin, Negt, Vygotsky, Kolb, etc. (Kolmos et al., 2004) who believe that learning is an active process rooted in experience. For this study, the instructor utilized a pedagogy framework in her PBL course development that was guided by the cyclical elements of learning found in the Stripling (2003) Model of Inquiry. Originally intended to frame the learning of information technology the model incorporates six phases in which the

students connect, wonder, investigate, construct, express and reflect on their learning (see Figure 1). In this constructivist model, students do not passively receive knowledge through a transmission oriented model of instruction (Castronova, 2002). Rather they actively process information with teacher guidance and feedback from peers.

Figure 1. Stripling Model of Inquiry



SOURCE: Used with permission from Stripling, B. (2010). Teaching students to think in the digital environment: Digital literacy and digital inquiry. *School Library Monthly*, 26(8), 16-19.

How People Learn Framework

The framework guiding the PBL course development for this study borrowed from current understanding in the learning sciences. The plethora of research supporting the *How People Learn*

(National Research Council, 2000) framework suggests that skills and knowledge must transcend the narrow contexts of initial learning. The framework explains that transfer occurs when learners know and understand the underlying principles that can be applied to problems in new contexts. Additionally, learners are most successful if they are able to use metacognitive skills to see themselves both as learners and thinkers.

The *How People Learn* framework is rooted in the belief that humans are predisposed to be both problem solvers and problem generators. Humans persist in the problem solving process because success and understanding are motivating in their own right. However, designing effective PBL learning environments can be complex. It requires the application of four instructional perspectives that integrate a) learner-centered environments, b) knowledge-centered environments, c) assessments that support future learning, and d) community-centered environments.

In effective learner-centered environments, learners use their current knowledge to construct new knowledge. Such environments help them make connections between their previous knowledge and their current academic tasks, thus increasing learning relevance and the motivation to learn. The ability to think and solve problems requires knowledge that is accessible or comes to mind quickly, and is relevantly applied. In a thoughtfully constructed knowledge-centered learning environment, the instructor strategically incorporates the learners' prior knowledge into the problem-solving process. In the construction of a successful PBL course, the *How People Learn* framework emphasizes that the instructor must consider formative assessments that effectively support learning. These assessments should provide learners with opportunities to revise and improve the quality of their own thinking and understanding. The framework also suggests that learning environments that promote a sense of community positively impact learning. Effective PBL learning environments should be designed with increased opportunities for learners to interact in out-of-school settings. Research has shown that such interactions positively impact the learner's motivation to interact, receive feedback, and ascertain new knowledge (McElvain, 2015).

When all four of the instructional perspectives proposed by the *How People Learn* framework are integrated into the design of a PBL course an emphasis on understanding becomes the primary characteristic that defines learning. Its focus is on the process of knowing (Piaget, 1978; Vygotsky, 1978). Learners are viewed as goal-directed agents who actively engage the co-construction of knowledge. They utilize prior knowledge, skills, beliefs, and concepts to organize

and interpret new learning which in turn affects their ability to problem solve and acquire new knowledge. It is a recursive, and cyclical process.

Setting and Participants

This case study observed the PBL design of a blended, interdisciplinary, 5-week PBL course developed for a Jesuit graduate education program in northern California that encourages education candidates to realize their full potential, and use their newly acquired skills for the greater good within their community.

Eight part-time candidates were enrolled in the course, six females and two males. Candidates brought to the course a wide variety of expertise in curriculum and instruction, technology education, and international education.

Course Design

This competency-based, PBL course was developed as a blended learning experience through JesuitNET. The “e-Learning” platform included all elements of Competency Assessment in Distributed Education (CADE) instruction, shifting the focus from what students know, to what students can do with what they know. Philosophically, the course was designed to follow the Ignatian Pedagogical Paradigm, which helps teachers and learners in a manner that is academically sound and at the same time is formative, “a person for others”. E-learning assignments included five modules which asked students to read chapters from the assigned text *Building School Community Partnerships* (Sanders, 2006) and discuss their thoughts through an online discussion forum.

The interdisciplinary nature of the course design provided candidates with opportunities to develop their understandings of the interactions among biological, psychological, and social dynamics in diverse families and communities. It also encouraged them to identify and build on the funds of knowledge in families and communities, and to establish connections with support systems for vulnerable youth within diverse communities. These understanding were developed through in-class literature circle discussions (see Figure 2) that were based on weekly readings from the text *Empowering family-teacher partnerships: Building connections within diverse communities* (Colman, 2013).

Figure 2. Literature Circle Major Concepts and Chapter Readings

Meeting	Concepts	Chapter Readings
#1	Setting Up Literature Circles	* Assign roles and reading for each week
#2	Exploring Family Units ROLE SHEET #1	* Chapter 1- <i>Contemporary Family Lives and Early Childhood Learning Environments</i> * Chapter 2 – <i>Developing a Guiding Philosophy of Family Involvement</i>
#3	Exploring Family Involvement ROLE SHEET #2	* Chapter 3- <i>Benefits of Family Involvement for Children</i> * Chapter 4 – <i>Benefits of Family Involvement for Families and Teachers</i>
#4	Exploring Diverse Partnerships ROLE SHEET #3	* Chapter 5- <i>Normed Families: Single Parent Families, Stepfamilies, and Grandparents as Caregivers</i> * Chapter 6 – <i>Emerging and Vulnerable Families: Gay and Lesbian Families and Families Living in Poverty</i> * Chapter 7 – <i>Families of Children with Disabilities</i>
#5	Exploring Cultural Responsiveness ROLE SHEET #4	* Chapter 8- <i>Immigrant Families and Families from Nondominant Cultures: Understanding the Adaptation Process</i> * Chapter 9 – <i>Adopting a Culturally Responsive Approach to Family Involvement</i>
#6	Exploring Family Involvement ROLE SHEET #5	* Chapter 10 – <i>Responding to the Challenges of Family Involvement</i> * Chapter 11 – <i>Empowering Families Through Family Involvement</i>
#7	Exploring Family Collaboration	* Chapter 12 – <i>Creating a Welcoming Environment for Families</i>

	ROLE SHEET #6	* Chapter 13 – <i>Communicating With Families</i>
#8	Family Involvement Program Model Development	* Use Chapter 14 to Organize Your Family Involvement Model
#9	Family Involvement Model Presentations	* Present Your Family Involvement Model to the Class

During literature circle meetings #8 and #9 each group completed a culminating book project which asked candidates to design a *Family Involvement Program Model* using strategies discussed throughout the quarter and suggesting ways to build on or improve family-teacher interactions that existed within their school or social enterprise. This project was constructivist in nature and embedded the following two perspectives from the *How People Learn* framework – learner-centered environments and knowledge-centered environments.

The signature assignment within the course was a service-learning project, which deepened classroom learning through active service to others. Service-learning is a research-based, best-practice teaching strategy in which classroom learning is deepened through service to others. The structured process involves student decision-making in preparation for and implementation of meaningful experiences; provides time for reflection before, during, and after the action; and requires respectful communication that seeks to understand and value the diverse backgrounds and perspectives of those offering and receiving the service.

The project design asked candidates to identify an educational enterprise and a social problem within a diverse, high-need community. As candidates connected their enterprise to a social problem that presently existed within their selected community, they designed a service-learning experience, which was linked to the mission and vision of the enterprise while providing a meaningful, sustainable service to the community. Utilizing the knowledge-centered environment perspective from the *How People Learn* framework, the instructor formatively evaluated the projects on a weekly basis using the *K-12 Service-Learning Standards for Quality Practice* (National Youth Leadership Council, 2008). To aide in project development, candidates used the

Service-Learning Project Planning Toolkit created by the RMC Research Corporation for Learn and Serve America's National Service Learning Clearinghouse (2009) to design five core project components: a) investigation, b) planning and preparation, c) action, d) reflection, e) demonstration of results and celebration. Each project design component correlated with all phases of Stripling's (2003) Model of Inquiry - connect, wonder, investigate, construct, express and reflect.

The activities within the *Service-Learning Project Planning Toolkit* gave candidates opportunities to dive deep into practices characterized by the fifth perspective in the *How People Learn* framework - community-centered learning environments. Candidates developed experiences which engaged their enterprise in the a) identification of a potential social problem, b) establishment of a meaningful partnership between enterprise participants and community recipients c) research of possible service solutions, d) development of project goals, learning objectives, and formative benchmark assessments to determine progress, e) integration of reflection, civic knowledge, skills, and f) public celebration and demonstration of project goals.

Project Presentations and Reflections

On the last day of class, candidates presented their service-learning project design to the class. Students interacted by asking questions and giving constructive feedback to each other throughout each presentation. Project titles and partnership affiliations included: a) *Google's BOLD Teens Project* – A Google - Local High School Partnership, b) *The Huff Elementary School Fresh Food Exchange* - A Neighborhood - Local School Partnership, c) *The Building Bridges Between the Cashion Cultural Legacy and the Community Project* – A School, Community, and Cultural Organization Partnership, d) *Partners in Arms: The CAMP College Program Buddy System Project* – A College Assistance Migrant Program and Local School District Partnership, e) *Recycling Your Success: Alumni Mentoring Program* – A LEAD Scholarship Program and University Alumni Partnership, f) *Building Water Consumption Literacy: Effective Ways to Reduce Your Water Use Footprint* – A Local Christian School and Community Partnership, and g) *Developing Community Relationships to Inspire the Innovator in Everyone* – A Tech Museum of Innovation and Local Community Partnership.

As candidates reflected on their service-learning project development, many expressed profound connections between service-learning and PBL in diverse community contexts. One woman wrote, "Helping others is a powerful tool that makes one feel valued, while at the same

time benefitting the recipient.” Another wrote, “My school is launching a PBL initiative next year. Service-learning and PBL align perfectly, and there may be a particular grade level that wants to take this on initially as a PBL unit, and then carry on with it throughout the year, showcasing their learning in public forums along the way.” A third wrote,

I hope to help build the bridge between the CCL and the school systems in our area. I want the local students to take advantage of the activities the CCL has to offer and I really want the CCL to thrive in our community. I believe that there is no way around not acknowledging the great Latino presence in our community and I think the CCL is a great way to present the richness of our culture in a positive light to the outside world.

One young first generation migrant candidate wrote,
Being a first-generation migrant student my whole life, I was very fortunate to be able to qualify for the services that the migrant education program provided me from middle school all the way to my first year in college. In a like manner, I would like to propose a plan where we can strengthen migrant programs. I would love for the College Assistance Migrant Program (CAMP) a program that guides the transition of first generation migrant freshmen and mentors them throughout their first year in college to create a partnership with local school districts that also offer a component or Migrant education services in middle schools. My vision for this partnership is for College Freshmen, or CAMPers, to do their required service-learning at one of these schools and be a mentor to a migrant middle schooler - something like a buddy system for one whole semester.

Conclusion

Students do not learn in silos of isolation behind closed doors. The future of learning for university graduate students intersect and surpass boundaries of disciplines. It invades spaces of reality where people work together to solve critical social problems within diverse community contexts.

The future of learning for university graduate students views learners as agents of social change as they bring to each new learning experience the relationships they have forged within their own families, friends, and community contacts, the personal struggles they have overcome, and the relevance of what matters most.

The future of learning for university graduate students is personal, and problem based. It

bridges the gap that exists between the micro-interactions that exist both inside and outside of school. People connecting with people on a personal basis creating networks of resources necessary for building thriving communities of hope.

The creation of this interdisciplinary PBL course has taught me that real school exists outside the walls of an institution. The intersection of discovery and learner/knowledge centered environments create democratic community learning spaces that advocate for equality and justice that are currently under explored in higher education. It is my hope that the future of learning for university graduate students advocate for inclusive community collaborations that embrace diversity, and a sense of connectedness to the human spirit.

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