

2020

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Recommended Citation

Winn, Pam (2020) "Graduate Student Perceptions of Cohort Delivery and Problem-Based Learning in Online Principal Certification Courses," *School Leadership Review*. Vol. 15 : Iss. 1 , Article 26.

Available at: <https://scholarworks.sfasu.edu/slr/vol15/iss1/26>

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Cover Page Footnote

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This is a submission for an accepted article. The only changes made were related to format.

Graduate Student Perceptions of Cohort Delivery and Problem-Based Learning in Online
Principal Certification Courses

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Introduction

Designing courses for aspiring school leaders who will serve in the complexity of today's digital world necessitates the need for learning opportunities utilizing 21st Century skills,

meaningful context, and fidelity to the researched-based skills required for the role of the principal (Marzano, Walters & McNulty, 2005). The cohort model facilitates online learning in a community-based environment in which students can progress through a series of classes together (Alman, Frey & Tomer, 2012). The cohort model provides the collegiality and support absent in the online environment. Problem-Based Learning (PBL) is a valuable pedagogical approach to enable students to take ownership of learning through a student-centered approach using constructive investigations, collaboration, communication, and reflection within real-world practices (Kokoskaki, Menzies, & Wiggin, 2016). This study engaged cohorts of students in online graduate classes centered on problem-based learning in which students worked collaboratively to discuss issues surrounding a common problem, but each student had to solve the problem as it authentically applied to their district. In Texas, the principal certification programs/course work has increasingly moved to a completely online environment. As more and more programs move to an online format, identifying effective engagement models and learning strategies will help define the best practices for future learners.

Problem-Based Learning in Online Environments

The Problem-based learning (PBL) process centers on designing learning opportunities that are collaborative and constructive and driven by self-directed, critical thinking processes (Camacho, Coto, & Jourgensen, 2018). Barell (2007) defined problem-based learning as an investigation process in which students solve doubts, curiosities, problems, and uncertainties in a real-life context. The PBL pedagogy includes four components: 1) complex, real-world situations with multiple possible answers; 2) students engage in the work in teams; 3) teachers work as facilitators; and 4) problems lead to the development of clinical problem-solving skills (Savin-Badin & Wilkie, 2006). This pedagogy lends itself to greater preparation to adapt from the academic setting into the real world work setting. PBL helps students develop skills in questioning, problem-solving, critical thinking, reflection, and teamwork (Barell, 2007). Those facilitating the PBL process must design learning opportunities closely aligned to the components of PBL. This process can be more difficult when designing PBLs for the online environment.

Studies related to using problem-based learning (PBL) in the online environment have increased (Tsai & Chiang, 2013) and have noted learners who use PBL in the online environment are motivated and engaged in the work (Delialioğlu, 2012) and develop higher-order thinking skills and critical thinking skills (Şendağ & Odabaşı, 2009). Furthermore, comparisons of PBL online and face-to-face learning noted student's attitudes and success levels were higher in the online environment (Gürsul & Keser, 2009). While the benefits of PBL in the online environment are evident, the craft of designing and facilitating online courses utilizing PBL can be difficult. For example, the collaborative aspect of PBLs in online classes is complicated due to the separation of the learning group with space and/or time (Simonson, Smaldino, Albright, & Zvacek, 2015). PBL requires ongoing collaboration, communication, and access to additional resources. In addition, the learning management system (LMS) should include tools to support students in both synchronous and asynchronous methods (Savin-Baden & Wilkie, 2006). Possible online tools might include discussion boards, chats, virtual video chats, or recorded videos. Once the appropriate online tools have been

selected, it is essential for feedback is provided to the students before and during the PBL process.

Utilizing formative feedback and feed-forward processes are essential in the PBL implementation. Formative feedback allows the learner to make adjustments and modifications to the product prior to submission. Whereas feed-forward provides students with guidance before they attempt the project (Hendry, White, & Herbert, 2016). Some examples of feed-forward would be rubrics, self-assessment rubrics, and exemplars. These two instructional strategies answer three questions: (a) where am I going (b) how am I doing (c) where to next (Hattie & Timperley, 2007). The use of feedback and feed-forward help increase completion PBLs, as well as, support students in developing a deeper understanding and improving the quality of their work (Webb & Moallem, 2016).

In addition to providing the necessary tools for students to work collaboratively in an online environment, institutions of higher education should examine structures within the organization which prohibit the processes associated with PBL. Li (2013) noted without a radical conceptual change in learning, the implementation of PBL at the university level was unlikely. For example, many of the institutional norms associated with power struggles such as entrenched practices that limit change and the confines of the organizational structure can inhibit PBL implementation (Li, 2013). For example, the traditional course delivery model designed characterized by students working alone to produce a product or attempt to move a face-to-face class online without changing from a lecture to an interactive format. Camacho, Coto, and Jorgensen (2018) noted organizations must examine the current culture to determine if it will support PBLs. Furthermore, they support developing an organizational culture that supports PBL in both the learning philosophy and pedagogical approach. Thus, indicating the PBL implementation process would yield new forms of interaction, and the creation of knowledge (Camacho, et al., 2018). Utilizing the cohort model in higher education is one such process that could facilitate greater interaction and collaboration among students.

Cohort Model

The science of teaching has benefited from significant findings from the 1960s on the uniqueness of the adult learning process. (Knowles, 1980). Decades later, Barnett and Caffarella (1992) published one of the seminal studies on how adults learn by providing a conceptualization of cohorts--a growing trend at that time--and the importance of applying andragogy. This descriptive study examined cohorts in the context of the following seven components: (a) selection procedures, (b) program options, (c) instructional delivery mechanisms, (d) initial developmental activities, (e) reflective seminars, (f) individual learning opportunities, and (g) long-term involvement. Brooks (1998) followed with one of the first empirical studies that found a strong correlation between applying adult learning strategies and cohort members' reports of positive experiences, ranging from empowerment, ownership of learning, sense of inclusiveness and promotion of collaboration, to increased academic achievement.

Interconnectedness is a crucial aspect that the cohort learning model offers. Alman, Frey, and Tom (2012) found positive effects of cohorts on students' attitudes and perceptions toward learning as a result of forming relationships with classmates. Burns and Gillespie (2018) examined the correlation between program completion and cohort students' need for autonomy, relatedness, and competence in their rigorous doctoral studies. Findings revealed

that the relational aspect of the cohort model was crucial in helping students feel supported in their dissertation phase. Furthermore, commonalities between cohort group members' backgrounds and experiences provided the emotional and social support needed for program persistence and completion (Govender & Dhunpath, 2011).

Learning in cohort groups promotes valuable opportunities for students to engage in communities of practice through the collaborations of peers and supervisors (De Lange & Chikoko, 2011). Enhanced attitudes and satisfaction toward collaborative learning environments were found among first-year engineering students (Doolen & Biddlecombe, 2014). Collaboration among teachers in a cohort program enhanced their social, emotional and professional development (Mukeredzi, 2014).

Diversity plays a significant role in the cohort experience. As students interacted with members of different experiential and social backgrounds, their overall sense of community and belonging increased (Mukeredzi, 2014). The cohort model supplies opportunities for members from diverse scholarship backgrounds to contribute their varying experiences and skills (De Lange & Chikoko, 2011). However, the diversity inherent in some cohort groups offers benefits as well as challenges when members hold opposing points of view (Govender & Dhunpath, 2011).

Method

The purpose of this qualitative study was to examine student perceptions regarding the use of a cohort model and project-based learning (PBL) in a completely online principal certification preparation classes. As part of a TEA funded grant, two districts (a cohort of 17 students) completed 24-semester hours of principal certification courses. All classes were online and emphasized PBL to engage the students in higher-level thinking skills. Participants were graduate and post-graduate students enrolled in coursework for principal certification in the state of Texas. At the time of data collection, the majority of participants were educators/instructional facilitators working in the classroom while enrolled in the course. Students responded to a short-answer questionnaire regarding their evolution throughout the course in terms of perceptions of the cohort model and PBL activities embedded in the coursework. Ten of the 17 graduate students completed the survey; six were male and five were female. Of the 10 students who participated in the study, four students had Master's degrees and six were degree-seeking.

Data Analysis

Thematic analysis (Creswell & Poth, 2018) was utilized to review and code the open-ended survey data. Individually, each researcher followed open and axial coding procedures and identified concepts, categories, and themes within the 10 survey responses (Creswell, 2016; Creswell & Poth, 2018). Two Peer-debriefing sessions followed in which researchers collapse categories and formed themes (Spall, 1998). Once the research team determined possible themes (Creswell & Miller, 2000; Creswell, 2016), solo thematic analysis procedures ceased. The categories were collapsed as researchers compared their findings and connections using participants' responses. Researchers continued thematic analysis until agreement and lack of agreement of themes were identified. Themes or categories without support or deemed unsubstantiated by fellow researchers were not included or reported. Quotes representing identified themes were reported. Researchers coded interview

transcripts into three themes during the peer debriefing sessions (Creswell & Miller, 2000; Creswell & Poth, 2018).

Findings

Three themes emerged from the thematic analysis and peer debriefings: Theme One (T1)-Cohort Experience, Theme Two (T2)-PBL Experience, and Theme Three (T3)-the Interaction between Cohort and PBL Experiences. Theme One, Cohort Experience, produced three supporting categories: Commonality, Relationships, and Greater Access to District Leadership Opportunities. Theme Two, PBL Experience, displayed two supporting categories: Authentic Learning and Individualization. The last theme, the Interaction between Cohort and PBL Experiences, revealed two supporting categories: Collaboration within Learning and Diverse Perspectives in Cooperative Learning Activities (See Figure 1).

Figure 1. Themes with Supporting Categories Generated from Open and Axial Coding During the thematic analysis and Peer Debriefing

Statements from students define and illustrate the themes best. Students' perceptions concerning their experiences with the cohort or the PBL learning experiences were positive, yet offered some constructive feedback for the development of future cohort/PBL learning experiences. The discovery of (T1) Cohort Experiences, (T2) PBL Experiences, and (T3) Interaction between Cohort and PBL Experience from students' comments provided a holistic acknowledgment of students' sentiment and perceptions of the learning experiences with cohort peers and PBL learning tasks.

Theme One (T1): Cohort Experiences

Student 6: *"Just having the chance to evaluate the content information with a group of people that are familiar with the circumstances of the district was extremely helpful to understanding and applying content knowledge."*

Student 4: *"It gave us a common "language" to understand the concepts and strategies we learned."*

Student 10: *"Completing this program within the district with which I plan to continue my career was invaluable. The immediate application of what we were learning with the extended opportunities my district provided made this so much more than a degree. I am truly prepared to serve my district as a principal."*

Theme Two (T2) PBL Experiences

Student 2: *"I would describe my PBL learning experience as positive and engaging. Problem Based Learning provided multiple opportunities for me to address real-life issues that require real-life solutions, which has helped me develop skills that I will be able to transfer to real-world scenarios as an aspiring administrator."*

Student 1: *"Not being in the classroom leads to more listening than participating when surrounded by teachers that use common terms and strategies."*

Student 8: *"The benefits of the problem-based learning model are that it helps us as learners take ownership of the process, and develop meaningful responses to genuine problems. The learning we did through the process is often through collaboration and development of ideas rather than rote facts."*

Student 4: *"However, in the future, I would suggest releasing all the information about each step at the beginning of the semester with an overview of how they all fit together."*

Student 10: *"Much of what I experienced was repetitive. I feel we could have gone deeper if the steps were more vertically aligned through courses."*

Theme Three (T3): Interaction Between Cohort and PBL Experiences

Student 2: *"As an aspiring principal, I feel prepared to be an administrator because the courses that I have taken as a graduate student have prepared me for the many roles that I would have to take on being an administrator."*

Student 4: *"I feel prepared because the courses taught the key concepts and strategies principals need to know to be the instructional leader of their campus and how to establish a positive culture."*

Student 5: *"I feel prepared because I was able to learn and experience many aspects of being an administrator through the real-world application in my courses and my practicum."*

Student 6: *"I wish there was a course that prepared admin for the disciplinary parts of principalship."*

Student 3: *"Along with that, I feel that the knowledge learned and experience gained as a teacher and district instructional coach has prepared me as well. I know that there is still much more to learn, but I feel I have a solid understanding of how to be an effective leader."*

Student 2: *"... sometimes the feedback received from instructors on the PBL assignments was minimum or not provided at all, making it difficult to determine what improvements or adjustments needed to be made going forward on other PBL assignments."*

Subject 8: *"The negatives are not associated with PBL but instead with the challenges that come with an online model. I believe these could be overcome with monthly "meetings" which provide expected time to come together."*

Holistically the cohort experiences and the PBL learning experiences were perceived as beneficial by students. Prepared for leadership challenges in the field was a common sentiment from student comments. The positive perception of the experiences as opportunities to learn and participate with peers were well represented in the statements. However, some mentioned a need to include experiences that would prepare them more for dealing with disciplinary issues. The only negatives related concerned the need for more feedback or step by step instructions as well as more communication on the online components of the learning experiences. Students also provided possible solutions in their reflective feedback concerning their learning experiences.

Discussion

Emotional Response to Course Expectations

Following the initial course review, students reported being overwhelmed, anxious, lost, and unsure of their ability to meet all course expectations and were concerned about meeting deadlines. Furthermore, they initially struggled to understand the specific requirements of the PBL activity. Even the two students who embraced the course as a learning opportunity still acknowledged they believed it would be a very challenging--perhaps monumental--task. When asked to share how they felt at the completion of the course, students reflected upon the experience as having provided a great deal of real-world application and sense of accomplishment. Although the PBL was described as "intense", "eye-opening", and "worth the effort", most expressed a sense of relief at having completed the project and increased awareness of the daunting task administrators face on a daily basis.

Personal Growth from Participation

Personal awareness of individual strengths and areas for professional growth was evident in the discourse. Students spoke of increased awareness of the importance of collaboration in problem-solving, development of a campus culture that promotes student success and continuous improvement, and the critical component of developing future leaders from the ranks of “those you lead.”

The knowledge and skills most commonly mentioned were improvement focused as well. Immersing oneself in campus data for the purpose of understanding current challenges, and planning for growth and improvement were common strands in the discussion. From Data analysis and teacher evaluation to budgeting and communicating for change, students utilized their individual campus data while collaborating with colleagues in the process of constructing a plan of action and communicating for implementation.

Impact on Future Instructional/Leadership Behaviors

Students realized the profound importance of collaboration and a creative approach to problem-solving for organizational change and improvement. One student made a comment, “This experience has deepened my desire to be a problem solver, not a problem revealer”, emphasizing the focus on solutions rather than problems and obstacles to success. This shift in attitude or perspective was found throughout the discourse as future leaders reflected on a renewed dedication to students, teachers and a culture of continuous improvement. Students realized the need “to dig deep into specifics and plan appropriately” and a commitment to “think creatively to come up with new solutions to old problems” as they refocused on “students as our focus”. This rhetoric is that of a growth mindset and a stark contrast to the pre-course rhetoric of the fixed mindset focused on the fear of the unknown and underlying emotions of anxiety and self-doubt (Dwek, 2007).

Planning for Course Improvement

When asked for input for improving the future course, the most common responses centered on time management increased opportunities for structured collaboration and the need for exemplars of what is expected in the final product/project of the PBL. Students were also very deliberate in their assertion that the course was intended for students on an educational leadership trajectory and currently serving in a professional capacity that would allow them access to campus data.

PBL Experience

The PBL as an instructional tool requires students to utilize multiple skills in communication, collaboration, problem-solving and time management. Although students approached the PBL with feelings of anxiety, apprehension, and even self-doubt at times, they exited the course with a sense of accomplishment, increased awareness of future leadership tasks and opportunities, and heightened self-confidence in their leadership abilities and skills. When asked to provide feedback for future course development, students overwhelmingly supported the continued use of PBL as an authentic learning experience but advocated for increased opportunities to collaborate in a more “face-to-face” format such as videoconferencing or other such media platforms.

Conclusions

While engaging in complex PBL tasks, students perceived their engagement with their cohort as meaningful. Therefore, leadership preparation programs should design learning experiences utilizing the cohort models and PBL pedagogy. In terms of the PBL pedagogy, the online classes facilitated collaborative activities and provided opportunities for students to work in small groups to digest the information together before working individually on their product. This feed-forward (Hendry, White, & Herbert, 2016) process included self-assessment rubrics, exemplars, and peer discussion before attempting the PBL product.

In addition, the shared experience of cohort students from the same district, but different campuses allow for a common language but diverse perspectives within the cohort. The online classes were open to students who were not in the cohort also providing diversity which facilitated healthy discourse when discussing how to solve the problem within the PBL. Diversity contributes to creative problem solving and deeper insight as they engaged in higher-order thinking (Şendağ & Odabaşı, 2009). In addition, students in the cohort had access to ongoing support from district personnel in a year-long practicum. This component allowed greater access to district personnel, as well as, providing insight into the authenticity aspect of the PBL experience.

Students often had the same professors for more than one class and were able to develop a professional relationship with the professors. Many of the classes were small and the cohort progressed through the same classes together, allowing for ongoing support from one another. This format helped facilitate dialogue among the cohort and other class members. It also created an environment of trust as they worked through challenging problems.

While many students indicated the pacing was appropriate, some felt it was too fast or too slow. One possible variation would be to redesign the PBL process to allow for greater individualization. Providing greater flexibility would benefit more students. As Mukeredzi (2104) noted, cohort membership is often diverse, consisting of varied backgrounds and experiences, and therefore would benefit from program flexibility.

Limitation

The findings in this study are limited to the perceptions of 10, graduate/post-graduate students enrolled in principal certification classes employed in 1 of 2 districts. Often the professional development, values, and ideologies are shared across a district; thus, the scope of the study could be limited. It is possible commonalities of the students within the cohort limited diversity of thought.

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