Teachers' Perceptions on an Online Gamification Professional Development

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Abstract

Most teachers need more experience with digital games and incorporating gamification elements into their classroom. This study covers the design and development of an online professional development (PD) on gamification for K-12 teachers. Findings from teachers' perceptions on the implementation of the online PD will be shared. The impact of this online gamification PD can inform practitioners and researchers who plan to implement these strategies in their own classrooms or conduct similar studies.

Keywords: *Games and Gamification*, *Online Learning*, *Professional Development, and Teachers' Perceptions*

Introduction

Gaming is popular among most children today outside of the educational setting (Gaudelli & Taylor, 2011). Games create opportunities for trial and error and offer the ability to increase rank and earnings. Classroom learning experiences may offer different or limited opportunities for earnings and engagement. This disconnects students, teachers, and the curriculum material, leading to a lack of student engagement and motivation. Research has identified that game-based learning can significantly increase student academic achievement levels; however, teacher perceptions, concerns, and attitudes toward gamification have remained relatively stagnant over the last ten years (Authors, 2019). Many teachers need to see the value game-based learning can offer, which could result from their general lack of experience with games (Gaudelli & Taylor, 2011).

Research also suggests a scarcity of professional development opportunities that prepare teachers to effectively implement digital gamification experiences in the classroom, which teachers often state as a barrier to using gamification (Sánchez-Mena, A., & Martí-Parreño, J., 2017). Research also reveals teachers' attitudes and perceptions towards gamification in the classroom have shifted from skeptical to generally positive (Becker 2007, Gaudelli & Taylor 2011; Gerber & Price 2013). While many teachers have positive attitudes and perceptions toward digital game-based learning, they reported that implementing games into their curriculum was not likely to occur in the short term (An, 2018).

A new approach to the application of games in education has been gamification. Although many definitions are available for gamification, a common understanding of this concept involves applying game elements (e.g., reward system, game narrative, rule-based, etc.) into non-game contexts (Detering 2011), such as educational settings. Even though there have

been some concerns and issues with the implementation of gamification in education (Hanus & Fox, 2015), when used properly, gamification can involve, inform and educate learners (Kapp, 2012).

This study aims to design, develop, implement, and evaluate an asynchronous online professional development training on gamification for K-12 teachers. The one-hour professional development training demonstrates how teachers can use gamification tools and techniques to enhance their instruction. The results of this study will contribute to the future design and development of online PD for teachers and the body of research in gamification.

Online Professional Development for Teachers and TPACK Framework

Professional development can inform teachers about current trends, teaching strategies, and tools in the field. This continuous learning and development of skills can enhance classroom teaching and learning experiences. After the COVID-19 pandemic, professional development for teachers has shifted from in-person to online platforms. Furthermore, effective online teachers' professional development is crucial in shaping the evolving global educational scene (Bragg et al., 2021). Although many professional development training and courses are available, most must be appropriately evaluated as some might be ineffective (Popova et al., 2022). Additionally, due to a lack of documentation of various teacher professional development (PD) initiatives, it can be challenging to identify the characteristics that lead to successful PD as they can include different teaching strategies, cover various subjects, be set to different durations, etc. (Popova et al., 2022). Thus, there is a need that future research in PD, especially in the online delivery mode, should prioritize insights into the design components and learner assistance mechanisms that enhance the program's effectiveness, which can assist in the conceptualization, design, construction, and delivery of PD (Bragg et al., 2021).

For the design and development of the online program covered in this study, the TPACK framework has been used to design the structure and content of the PD. TPACK is a framework implemented in teaching with technology. Grounded on Shulman's (1986,1987) PCK model, TPACK involves three main core elements: content, pedagogy, technology, and their relationships. Regarding the framework's core knowledge, it is essential to note that each focus on a fundamental aspect of teaching, especially with technology. First, content knowledge (CK) refers to teachers' understanding of the subject matter intended for instruction; pedagogical knowledge (PK) represents teachers' understanding of the processes and teaching practices; and technology knowledge (TK) refers to teachers' use of technology in a broad manner in their professional setting and within their daily activities (Koehler, Mishra & Cain, 2017). Thus, with the three-core knowledge in mind, the online PD has been designed to cover games and gamification content not only as teaching strategies, i.e., PK, but also as digital technologies, i.e., TK, that can be applied to their teaching subject, i.e., CK, to foster learning and student motivation. The next section discusses the process of designing and developing the online module for teachers' PD.

Design & Development of Online Gamification PD for Teachers

Dick and Carey's Model (Dick & Carey, 2005) of Instructional Design was implemented in the design and development of this training. The first component of this model focuses on identifying instructional goals. This model closely parallels Gagne's 9 events of instruction, which is the instructional framework used to guide the content organization portion of the training. Then, measurable performance objectives were written, and the performance assessments were developed. Each measurable objective had an assessment item in the online PD. Then, the instructional strategy is developed, and instructional materials are developed and selected afterward (Branch & Merrill, 2012). The next step is to design and conduct a formative evaluation, which includes data collection, analysis, and revision cycles. The first cycle determines if there are any errors, and the second cycle takes place after errors have been corrected and checks for any additional errors. The third cycle is a pilot test to make sure everything is seamless. Once the process has been checked, tested, and corrected, it is sent out for final use. Dick & Carey (2005) state that all the components, learners, materials, delivery system, and environment interact and work together as a system to bring about the desired learner outcome.

Research Methods/Techniques

This study examines teachers' perceptions of an online gamification PD. A design-based research (DBR) approach has been implemented throughout the process of designing and developing this PD. DBR is often used to solve complex and practical education problems through the implementation of iterative solutions, evaluation, and revisions (McKenney & Reeves, 2012). This study represents the third cycle of a multi-cycle effort to develop a robust online gamification PD that benefits teachers.

Quantitative data has been collected through online surveys. Participants (partnership teachers within the district) have been asked to complete a pre-and post-survey that examines their knowledge and experiences with gamification in the classroom. Most of the questions are designed to be a 5-point 12 Likert (strongly disagree = 0 to strongly agree =5) item scale measuring the change in their confidence level with gamification after the completion of the PD. Surveys have been analyzed using quantitative statistical methods to provide summaries and any changes in participants' perceptions. Some open-ended survey questions may provide limited qualitative data regarding teacher perceptions of gamification in the classroom. Although participants' demographic data has not been collected, the participants who completed both surveys for this study are in-service teachers (N=25).

Preliminary Findings

The results from the quantitative data show that teachers felt more confident using gamification techniques in their classes after the completion of the PD. For instance, there has been a 26% increase in the "strongly agree" response and a 28% increase for those who "agree." When asked about the confidence level of their gamification knowledge, there has been an increase of 26% for those who responded, "strongly agree" and a 35% increase for those who

responded "agree." Teachers' perceptions regarding gamification have also changed, with a 17% increase for those who responded, "very positive" and a 19% increase for those who responded "positive." Additionally, when asked about the PD objectives, all participants agreed that the objectives for the PD were clear and met by the content of the program. A common ranked motivator in both pre-and post-survey to learn more about gamification has been "student engagement." Overall, the qualitative data about additional changes to the PD have been positive, with most teachers being satisfied with the PD as it is and some suggesting a few adjustments for improvements.

Significance of the study

Gamification can significantly impact education and beyond. However, teachers need to be trained to effectively use these technologies and new approaches in their classrooms before implementation. Additionally, the level of customization that gamification provides learners can allow for more personalized learning and even a culturally situated learning design. The impact of this online gamification PD can inform practitioners and researchers who plan to implement these strategies in their own classrooms or conduct similar studies.

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