Preparing Preservice Teachers for Classroom Management with the Use of Online Case-based Instruction Strategies

Zafer Unal
University of South Florida
Aslihan Unal
Georgia Southern University

Abstract

Preservice teachers often need help applying classroom management theories to real-world situations due to their abstract nature. Using a case-based instruction strategy for teaching classroom management topics is a common practice to introduce preservice teachers to the contextual complexity of classrooms. This study investigates and compares the effectiveness of two case-based teaching strategies: face-to-face discussion versus a gamified online case-solving platform. Gamification is an instructional approach incorporating game design elements to enhance learners' motivation and engagement in educational environments. It is aimed at increasing students' interest and involvement in learning activities. The study showed that the gamified online case-solving platform group scored higher on the pre-test, post-test, and student perception surveys. The study examines and discusses the possible reasons for the new method's success and provides potential implications.

Keywords: preservice teachers, classroom management, gamification, online case-based instruction, face-to-face teaching.

Introduction

Research findings consistently highlight the crucial role of effective classroom management and instructional organization in teaching success (Brophy, 1988; Cakmak, 2008; Emmer et al., 2000; Johler et al., 2022; O'Neill & Stephenson, 2014; Sanetti et al., 2013). Alarmingly, over one-third of new teachers exit the profession within their first three years, with many attributing their departure to challenges in classroom management (Bushaw & Gallup,

2008; Hattie, 2009; Jones, 2006; Jones & Jones, 2010). Concerns persist among educators regarding the adequacy of support and clarity of expectations related to classroom management procedures (Cooper et al., 2018; Mireles-Rios et al., 2019; Shank & Santiague, 2022). Additionally, active teachers identify deficient classroom management skills and disruptive student behavior as significant impediments to their professional advancement (Domitrovich et al., 2010; Fideler & Haskelhorn, 1999; Long et al., 2019). Despite receiving training through accredited teacher education programs, many educators feel ill-prepared to address classroom and behavior management challenges (Britt, 1997; Ganser, 1999; Gee, 2001; Halford, 1998; Houston & Williamson, 1993; Jacques, 2000; Ladd, 2000; Pigge & Marso, 1997; Recard & Nathania, 2021; Smith, 2000; Solomon et al., 2012; Tahir et al., 2019; Veenman, 1984)

Teacher education programs face the critical challenge of helping future teachers get beyond a narrowly defined view of classroom management, which often means focusing on managing children's behavior (Ayers, 2001; Carter & Van Norman, 2010; Doyle, 1986). These programs usually target preparing their candidates in research-based classroom management strategies, beginning with the foundational courses and continuing to their culminating experience as student teachers (Anwar et al., 2022; Grebner et al., 2010). Literature suggests that both aspects of classroom management preparation -coursework and practice- deserve careful institutional attention (Jones & Jones, 2010; McCormack, 2001). In any case, programs should not rely on coursework or clinical practice alone to prepare teacher candidates in classroom management (Ladd, 2000; Savage & Savage, 2009). Lack of effective strategies, inadequate preparedness for behavioral problems, and limited training in evidence-based classroom management were identified as major concerns (Shank & Santiagua, 2022).

Many preservice teachers report that classroom management theories and concepts they learn in their coursework are usually too abstract to address specific classroom management problems they encounter in their field classrooms (Delwiche, 2006; Kretlow & Bartholomew, 2010). In fact, within a limited classroom environment where teacher education programs often provide students with didactic lectures, it is usually the case that some students need to be more engaged in reflective thinking and deepening their understanding of the topics taught (Lewis et al., 2011). Consequently, it is suspected that some of the knowledge acquired in the lecture-based college class cannot be spontaneously utilized in real-world problem-solving situations. Thus, the literature suggests that beyond the traditional textbooks, classroom management instruction

during the coursework should focus on identifying, designing, and utilizing learning resources that can enhance students' classroom management problem-solving abilities that can easily be integrated into the existing framework of the lecture-oriented classroom (Bell & Morris, 2009; Delwiche, 2006; Kretlow & Bartholomew, 2010; Lewis et al., 2011).

This quasi-experimental study utilizes pretest-posttest measurements and descriptive surveys to examine students' experiences, including learning gains and perceptions, during participation in face-to-face and online case-based learning. Quasi-experimental methods, which entail establishing a comparison group, are frequently employed when randomizing individuals or groups into treatment and control groups is not feasible.

This study addresses the issue of teacher turnover and classroom management dissatisfaction, significantly impacting novice and experienced teachers. Research consistently highlights the critical role of effective classroom management in teacher success and retention. Despite the emphasis placed on classroom management in teacher education programs, many teachers feel they need to prepare to handle their challenges, leading to high stress levels and attrition. Furthermore, while traditional teacher education programs focus on theoretical concepts and research-based strategies, there is often a gap between coursework and real-world application, leaving teachers needing to be equipped to manage actual classroom situations effectively.

This study contributes to the literature by highlighting the need for teacher education programs to enhance classroom management instruction through more practical and engaging approaches. By identifying the limitations of traditional lecture-based methods and emphasizing the importance of incorporating experiential learning and problem-solving activities, the study advocates for a shift toward more dynamic and interactive instructional strategies. This approach addresses the disconnect between theory and practice and better prepares future teachers to navigate classroom management's complex and often unpredictable realities. By acknowledging and addressing these challenges, teacher education programs can improve teacher retention rates and ultimately enhance student learning outcomes.

There are two research questions in this study:

1. Is there any significant difference in preservice teachers' learning gains regarding classroom management between face-to-face and online case-based teaching?

2. What are the preservice teachers' perceptions regarding using face-to-face and online tools for classroom management case studies?

Literature Review

Using Cases/ Scenarios to Teach Classroom Management

A "case or scenario" is a problematic situation a teacher faces that calls for some decision or action on the teacher's part. A case is a realistic example, a true story, or a real-world example (González-González et al., 2014; Gravett et al., 2017; Ulvik, 2022 & Walther, 2016). The case is intended to draw students into engagement with situations, problems, and roles representative of those faced in "real life" classrooms. Greenwood and Fillmer (1999) describe cases as a middle step between coursework and actual teaching via ill-structured cases. Using cases or scenarios is one of the approaches practiced in teacher education programs to connect theory and practice, especially in classroom management (Herrington & Oliver, 2000; Jong et al., 2006; Lewis et al., 2012). In their research conducted in 2022, Ulvik and colleagues aimed to help the students describe how they would choose to respond in a specific situation, as well as to provide theory-based reasons for their choices and discuss potential alternatives.

Some classroom situations might be relatively straightforward (i.e., after children finish free play time, they must clean up for the next activity). Such situations could be well-defined problems to which clear goals and general rules can be applied for problem-solving (Butler et al., 2006). However, many other issues related to managing the classroom involve uncertainties about problem definitions (i.e., what happened and how did it happen here?), conflicting perspectives among different stakeholders (i.e., a child says one thing while his or her peer says another thing about what happened between them), and the need for multiple solutions and multiple criteria for solution evaluation (i.e., let's try this if this doesn't work, let's sit down to think about what is a better way of working together). These are the general features of ill-structured problems (Shin et al., 2003; Smith et al., 2011; Skeriene & Juceviciene, 2020). Unlike well-structured problems, how ill-structured problems are dealt with is greatly influenced by problem solvers' opinions or beliefs about problem situations (Hester & MacG, 2017; Meacham & Emont, 1989; Saleem et al., 2020). While empirical studies in this area are still limited, problem-solving researchers have identified several essential factors influencing the general performance of solving ill-structured problems. These factors comprise epistemological beliefs that value multiple perspectives (Harrington et al., 1996), skills in justification and

argumentation to resolve conflicting interpretations and solutions, metacognition involving planning and monitoring solutions and processes (Shin et al., 2003), and domain knowledge (Chi et al., 1982).

The case-based approach is an effective teaching method across multiple disciplines, such as law, medicine, and business (Kaur et al., 2020; Kim et al., 2006; Rippin et al., 2002; Suico, 2021). Recently, teacher educators have used case-based instruction more with pre-service (Hemphill et al., 2015), beginning, and even experienced teachers (Mostert, 2007; Ulvik et al., 2022).

Cases involve real-world situations and consider the perspectives of various stakeholders, including teachers, school leaders, parents, students, and other community members. Through case-based discussion, students enhance their critical thinking, decision-making, analytical thinking, and problem-solving skills (Diamantes & Ovington, 2003; Elksnin, 1998, 2001; Hunt, 2009; Kolodner, 1997; Kolodner & Simpson, 1989; Pindiprolu et al., 2003; Saleem et al., 2021; Zottmann et al., 2012). In addition, Merseth (1990, 1991) suggests that while the use of case or scenario in teaching usually brings greater student interest, interactivity, and increased reflection, there are practical problems with this strategy, such as unfamiliarity with the methodology, problems with written expression, time and class size, physical setting for the discussion, the teaching style of the case leader, and case preparation and complexity.

Given the numerous benefits of case-based learning in teaching, such as enhanced critical thinking, reflection, and problem-solving, educators continually seek innovative methodologies to further optimize and enhance its potential. One emergent trend in the field of education that holds promise in this regard is the gamification of learning experiences. While cases provide rich, contextual problems for students to grapple with, students' motivation and engagement levels might be amplified by embedding these case scenarios within a gamified framework.

Gamification of Education

While the idea of incentivizing people has existed for quite some time, the term "gamification" entered the mainstream vocabulary very recently (Iqbal et al., 2021; Kavrayici, 2021; Oliveira et al., 2023; Seaborn & Fels, 2015). Unlike "game-based learning," which relates to the use of games to enhance the learning experience, "gamification" is a developing instructional approach for increasing learners' motivation and engagement by incorporating game design elements in educational environments (Hanus & Fox, 2015). In other words,

gamification is the application of game mechanics to a non-game environment to influence human behavior to foster motivation, behavioral changes, friendly competition, and collaboration in educational contexts (Deterding et al., 2011; Erdem & Erdem, 2021; Lee & Hammer, 2011; Sarkar & Kundu, 2021). Gamification techniques leverage people's natural desires for competition, achievement, status, self-expression, altruism, and closure because gamification transforms the learning experience into an educational game using achievement badges, leaderboards, point systems, level progressions, and quests. These game elements are integrated to help learners achieve their learning goals and objectives (Adhikari, 2021; Bunchball, 2010; Hanus & Fox, 2015).

For students, gamification minimizes negative emotions that they usually encounter in traditional forms of education. It lets them approach knowledge and skills using the learn-by-failure technique popular in game-like environments without the embarrassment factor that generally forms a part of classroom education. Researchers warn practitioners that while gamification can be an effective way of teaching, it is more than simply integrating some game elements into a learning activity (points, badges, etc.) to enhance student learning activities. Therefore, it should be planned and executed very carefully. Huang and Soman (2013) provide a five-step process that can increase the probability of creating an effective education gamification strategy (Table 1).

Table 1

Five-Step Process to Gamification

Steps	Definition
Understanding the target audience and context	Who is the target audience (age, learning abilities, current skill-set, etc.), and what context surrounds the education program?
Defining learning objectives	What does the instructor want the student to accomplish by completing the education program?
Structuring the experience	How can the learning program be broken down, and what are the Stages and milestones?
Identifying resources	What are the resources needed for gamification (tracking

	mechanism, currency, levels, rules, feedback)
Applying gamification elements	What gamification elements should be applied (points, achievement badges, levels, leaderboards, etc.?

Gamification in Teacher Education

Teacher education, the foundational phase where educators-to-be acquire the skills and knowledge to guide students, is no exception to the influence of gamification. In recent years, teacher training institutions have been experimenting with gamification to enhance educators' preparation and professional development (Dicheva et al., 2015). This stems from the understanding that gamification can similarly benefit teacher trainees if it can enhance student engagement and motivation.

Incorporating gamified elements into teacher education courses can offer numerous advantages (Nieto-Escamez et al., 2021; Nousiainen et al., 2020; Zourmpakis et al., 2022). Firstly, it facilitates experiential learning. Teacher trainees can be put in scenarios and challenges that resemble real-world classroom situations, allowing them to make decisions, experience outcomes, and reflect in a safe environment. For instance, a gamified module might involve managing a virtual classroom, where the decisions made by the trainee affect student outcomes, engagement levels, and classroom dynamics.

Secondly, gamification in teacher education can also foster collaboration and peer learning. Through team-based challenges or leaderboards, trainees can work together, share strategies, and learn from each other's experiences. This enhances their problem-solving skills and helps build a community of educators who can support each other in their professional journeys.

Lastly, gamified elements can provide immediate feedback to teacher trainees, allowing them to identify areas of improvement and adjust their strategies accordingly. This is particularly crucial in teaching, where responsiveness and adaptability are key. The use of badges, points, or levels can help visualize a trainee's progression, making their learning journey more transparent and motivating.

However, as with gamification in other educational contexts, care must be taken when implementing it in teacher education. The game elements should align with the intended learning

outcomes and not overshadow the core content. The primary goal should always remain to produce competent, reflective, and effective educators, with gamification as a tool to facilitate, not replace, this process (Goeke, 2008; González-Fernández et al., 2022).

Theoretical Framework

Bandura (1977) posited that self-efficacy refers to an individual's belief in their capability to execute tasks and achieve goals. In the context of teaching, teacher self-efficacy relates to a teacher's confidence in their ability to promote students' learning, even when faced with challenges. Research suggests that teachers with higher self-efficacy are more persistent and enthusiastic and employ more effective classroom management strategies (Tschannen-Moran & Hoy, 2001).

Classroom management is a pivotal aspect of effective teaching and involves organizational, social, and instructional dimensions (Emmer & Stough, 2001). Successful classroom management is anchored in teachers' beliefs and self-efficacy about teaching and learning (Hoy & Spero, 2005). Rosas and West (2009) point out that a positive correlation exists between teacher self-efficacy and successful classroom management strategies. Similarly, Gencer and Cakiroglu (2007) observed that preservice and in-service teachers with higher self-efficacy tend to believe more in student-centered teaching and learning approaches.

Given the intricate connection between teacher self-efficacy, beliefs, and classroom management, designing teacher education programs that bolster this self-efficacy is imperative. The utilization of case studies in teacher preparation offers one such avenue. Case studies present realistic and contextually rich scenarios that allow preservice teachers to reflect upon and engage with the complexities of classroom situations (Levin, 1995). By presenting them with scenarios mirroring real-life challenges, case studies enable teachers to critically analyze situations, enhance their problem-solving skills, and solidify their beliefs and self-efficacy regarding classroom management.

Introducing gamification into this paradigm offers a novel dimension. As explored in our research, gamified environments enhance motivation, engagement, and learning outcomes (Deterding et al., 2011). When combined with case studies, gamification can further amplify experiential and contextual learning benefits. The interactive nature of gamified case studies can serve to simulate classroom scenarios more vividly, providing preservice teachers with a 'safe' environment to test and refine their classroom management strategies.

O'Neill & Stephenson (2012) emphasized teacher beliefs' influence on classroom behavior and practices. In a gamified learning platform, as teachers engage with cases, earn badges, progress through levels, and receive feedback, they develop their classroom management skills and construct and reinforce their beliefs about teaching. The immediate feedback and rewards system inherent in gamified platforms can foster positive reinforcement, further enhancing teacher self-efficacy.

In conclusion, grounding our research in the theoretical framework of teacher self-efficacy and beliefs in relation to classroom management provides a holistic perspective on the potential benefits of gamified case studies. As preservice teachers engage with these cases in a gamified environment, they will likely experience improvements in their classroom management skills, beliefs about teaching, and overall self-efficacy, preparing them for the multifaceted challenges of real-world classrooms.

Project Background

This research project investigated the effectiveness of adopting case-based teaching methods in a classroom management course face-to-face (in the classroom) and online (using gamified online case-study tools). A classroom management course taught at a large southeastern university was the site of this investigation. The course was designed for preservice elementary education program students to help explore current knowledge of best practices of various teaching and management strategies and methods deemed appropriate for diverse elementary school settings.

For many years, one of the significant learning activities integrated into this course has been the "classroom management" cases. This activity aims to help students learn about real-world classroom management problems, interact with classroom management and behavior issues, and discuss possible solutions and outcomes. The learning outcomes of this activity are correlated in the program matrix with the state certification examination competencies (Florida Department of Education, 2023). In other words, this learning activity is created and embedded into this course to help preservice teachers master the classroom management competencies listed on state certification tests. The classroom management competencies listed in this examination are selected by the committee of Florida educators, reviewed, and validated by another committee of Florida educators.

During the last three weeks of the semester, the course instructor brought twenty different classroom management cases/scenarios to discuss possible solutions. The twenty cases for this activity are carefully selected so that they are correlated with the FTCE Professional Examination competencies. They represent classroom management course topics such as classroom organization, classroom rules and procedures, planning and managing student homework, planning and managing the first days of school, designing and managing cooperative learning, encouraging and maintaining appropriate behavior in the classroom, dealing with problem behaviors or misbehaviors, communication strategies for teachers, etc. These cases are articulated as dilemmas to prompt as many varied responses as possible. Also, all the cases are written in first-person language to give the impression that the characters described in the cases are asking for help. The cases are provided to students (preservice teachers) as hard copies in class. During the activity, students develop a case summary and prepare an individual response to each case. Then, students work as a group to develop a consensus response for each case. The instructor then presents each case on-screen and invites students to discuss possible solutions.

Student feedback over the years has always been positive about the "case-based learning activity" integrated into the course because it (a) allows students to explore different perspectives on cases, (b) helps students assume a sense of ownership of their learning, (c) allows students to explore classroom cases more deeply than simply reading about it or listening to a lecture about the topic, (d) forces active participation rather than listening to a lecture and (e) improves student motivation (Unal & Unal, 2017). On the other hand, the three weeks of face-to-face implementation of the case-based learning activity also has brought several issues. For example, students were so excited to discuss classroom management cases that in addition to twenty instructor-prepared cases, there were always students trying to bring and discuss other classroom management cases or issues. Managing time to discuss other classroom management cases was very difficult, requiring instructors to extend the class time each week. As in every face-to-face classroom discussion activity, some dominant students and students felt intimidated or unmotivated to speak. Case activity in the face-to-face implementation did not allow equal time or participation for each student.

Another area for improvement was the non-anonymity. The classroom discussion of the cases usually resulted in students presenting routine, conformist, culturally sensitive responses,

taking the safe path due to non-anonymity. Students felt uncomfortable presenting unique and provocative responses or passionate pursuits not to make "a mistake" or say "something wrong."

The researchers sought possible solutions to increase the effectiveness of the "classroom management cases" learning activity and eliminate the above-mentioned issues. Current literature indicates that "online discussion forums" are the most commonly used learning environments for case-based teaching in face-to-face and online courses (Gao et al., 2013; Hewitt, 2003; Jeong & Frazier, 2008; Purwanti, & Vania, 2021; Wallace et al., 2019; Yeong, 2021). However, several significant limitations are identified by researchers who adopted discussion forums for case-based teaching methodology. For example, Hewitt (2003) complained about excessive student focus on new cases, indicating that students rarely visited online cases that were posted earlier and already received multiple responses.

Students believed they would have little to contribute because the case had received many responses. Medler & Magerko (2011) found out that when discussion forums are used for case-based learning, it is widespread for students to go off-topic within a particular case if the case is not moderated timely and effectively. They suggested that constant moderation is an essential but challenging part of this teaching method. Gao and colleagues (2013) explained that in a discussion forum environment, some students tend to agree with others too readily or paraphrase others' contributions rather than bring unique possible solutions for cases. This made it very difficult to assess the value of the messages posted for cases. Other researchers criticize the fact that it was challenging to identify messages under each case as a "possible solution to the case" or "a comment to a posted solution" (Hakaya et al., 2021; Oratmangun, 2021; Shireen et al., 2020). The inability of students to freely express their ideas and views on discussion forums because of the lack of anonymous postings was another limitation of using discussion forums for case-based teaching (Paramita et al., 2023). Reischer and colleagues (2017) stated that student motivation and participation will tend to be low without gamification functions added to online discussion forums.

Gamified Online Case Study Tool

Considering the limitations of using online discussion forums for case-based learning, the researchers created a web-based gamified online case-based learning environment. This project was completed to serve as an effective case-based learning environment without the limitations

of ordinary discussion forums. The project's design (website coding & interface design) took two weeks, and another week was spent testing the application. The project was published online.

Project Structure

This new project was structured differently, unlike the structure of discussion forums (questions on top with threaded comments). The case narrative is on the top for each case, and students can post a unique possible solution. Also, each solution had a section for student comments and discussions. Therefore, the cases, potential solutions, and comments were marked. Prompts were provided to help students post their solutions and comments.

Evaluating/ Voting Each Solution

The solution posted under each case is also available for evaluation by other users. A standardized rubric is used for a practical evaluation rather than marking solutions simply as "good or bad." The evaluation rubric contained various criteria such as the suggested solution "is original," "is relevant to the case," "is respectful of the individual (student)," "is reasonable (easy) for the teacher to implement," is likely to solve the problem." This type of evaluation assigns an average score for each solution posted by users and places the highest-scored solutions automatically on top with a rating algorithm.

Gamification Elements

The project also followed the "game-thinking" process that involves users solving problems using gamification elements. The following four primary mechanisms of gamification were added to the project: (a) rewards, (b) badges, (c) points, and (d) leaderboard. For example, users receive 5 points for posting a valid solution, 1 point for evaluating a solution, 1 point for posting a comment for an answer, 1 point daily for logging into the website, 1 point for each positive evaluation posted on their solution, etc. Students who made the most points on a given day, week, and month were listed on the website's main page.

Anonymity

For each message (case, solution, comment), users could select whether to be anonymous by taking up a username assigned by the website or using their names. Students still maintain their scores, badges, etc., under their accounts even if they post some messages anonymously. Researchers in this study attempted to investigate and compare the effectiveness of adopting a case-based teaching strategy via face-to-face versus gamified online case tool.

Methodology

Using cases or scenarios is one of the approaches employed in teacher education programs to bridge the gap between theory and practice, particularly in classroom management (Herrington & Oliver, 2000; Jong et al., 2006; Lewis et al., 2012). These cases aim to involve students in grappling with situations, problems, and roles reflective of those encountered in real-life classrooms. Greenwood and Fillmer (1999) characterize cases as a step between coursework and actual teaching facilitated through ill-structured cases. Here is an example of a case study illustrating this concept:

Student Makes Up Stories

> *While interning in a kindergarten class, there was a student, I'll call her Rebecca, in my classroom who made up stories. My cooperating teacher would receive an angry phone call two or three times a week demanding to know why other students constantly picked on their daughter. My cooperating teacher would go through the motions of finding out what happened, who did it, and why Rebecca never mentioned it to her or me. The most recent story Rebecca made up was that a boy from another class choked her during recess. My cooperating teacher again received a call, but this time, the principal demanded to know what was happening because Rebecca's parents threatened to press charges. When my cooperating teacher said she knew nothing about it, the principal came to the class and spoke with Rebecca to hear what had happened. Rebecca accused boy X of doing it the previous day. Unfortunately for Rebecca, boy X moved to another city the week before and could not have done what she said. Rebecca is an only child and the most intelligent student in the class. What could I do as a teacher to help Rebecca feel comfortable and want to be at school?*

In this quasi-experimental study, pretest-posttest measures and descriptive surveys were utilized to investigate students' experiences in face-to-face and online case-based learning. Due to the inability to randomize participants into treatment and control groups, a comparison group approach was employed. While the independent variable was manipulated, participants were not randomly assigned to conditions or orders of conditions (Cook & Campbell, 1979). The following presents the notation of the research design.

In this experimental setup, two groups of students were examined to assess the efficacy of different approaches to case-based learning: face-to-face and online. One group engaged in

face-to-face case-based learning, serving as the control group, while the other group participated in online case-based learning, acting as the experimental group. Both groups underwent a preliminary assessment to establish their initial knowledge or skill levels. Subsequently, each group received an intervention tailored to their respective learning mode. Following the intervention, all participants took a post-assessment to gauge any changes in learning outcomes. Moreover, both groups completed a survey to gather insights into their perceptions of the learning experience. This research design facilitated a comparative analysis of the effectiveness and student perceptions of face-to-face and online case-based learning methods.

The research aimed to address two primary questions. Firstly, it sought to determine whether there existed a significant difference in the learning gains of preservice teachers when exposed to face-to-face versus online case-based teaching methods in the context of classroom management. Secondly, the study aimed to explore preservice teachers' perceptions concerning utilizing face-to-face and online tools for conducting case studies related to classroom management. By investigating these questions, the research aimed to contribute valuable insights into the effectiveness and perceptions of different instructional modalities in preparing future educators for managing classroom environments

Participants

Eighty-seven undergraduate preservice education students who majored in the Elementary Education program and enrolled in a classroom management course participated in the study. The researchers randomly decided which technique to use in which section (Table 2).

Table 2

Study Participants

Participants	Gender	Ethnicity	Year at College
Section 1: Face-to-face Case-based Instruction	Males: 11, Females: 34	White: 28, Hispanic: 3, Black: 12, Asian: 2, Native American: 0, Other: 0	3rd Year: 39, 4th Year: 6
Section 2: Gamified Online Case-based Instruction	Males: 9, Females: 33	White: 24, Hispanic: 2, Black: 10, Asian: 5, Native American: 1, Other: 0	3rd Year: 37, 4th Year: 5

Total Participants	Males: 20, Females: 67	White: 52, Hispanic: 5, Black: 22, Asian: 7, Native American: 1, Other: 0	3rd Year: 76, 4th Year: 11

All students were informed about the research project in detail, provided informed consent to be part of the study, and were informed that their pretest, posttest, and survey participation would be anonymous and would not affect their course grades.

The researchers were not the instructors for the classroom management course in which the study participants were enrolled. To ensure the integrity of the research and minimize potential bias, several steps were taken to maintain separation between the researchers and the course instructors. First, the researchers collaborated with the course instructors to obtain permission to conduct the study within their classes but were not directly involved in the course delivery. This separation was essential to prevent any undue influence on the participants or the course content, as researchers who are also instructors might inadvertently introduce bias through their teaching methods or interactions with students.

Second, the course instructors were only informed about the specific research objectives or the random assignment of instructional techniques to the course sections after completing the study. This delayed disclosure prevented instructors from modifying their teaching approaches or unintentionally influencing the study outcomes based on their knowledge of the research design.

Additionally, the researchers employed techniques such as anonymizing pretest, posttest, and survey responses to safeguard participant anonymity further and reduce the likelihood of bias. These measures were implemented to create a clear separation between the researchers' and instructors' roles, thereby minimizing any potential bias that might arise from their dual roles in the educational setting.

Instruments

Pretest and Posttest

Before the study started, students in both sections were asked to take a pretest with twenty multiple-choice questions correlated with the competencies listed on the Florida Teacher Certification Professional Exam. The pretest and posttest questions were prepared with the collaboration of three faculty members teaching different sections of classroom management courses at multiple university campuses for years. These test questions are aligned with the

FTCE Professional Exam competencies and have been used in all course sections every semester. In other words, the test was not modified for this experiment. In addition, none of the twenty questions were explicitly discussed during the study. Participants' learning gains on this test were used to compare the control and experimental groups. An example question is listed below.

Question 1. Ms. Jennifer's fourth-graders know that if they do something wrong, they must write "I will follow school rules" 100 times during recess. Three students are being punished in this manner today: Jay for poking classmates, Amy for talking during a lesson, and Ed for not completing his homework. According to Dreikurs, Mrs. Shay should consider _____.

a) using more logical consequences as part of her discipline approach.

b) using after-school time for the punishment, as this has been shown to be more effective

c) using a more imaginative approach to discipline

d) abandoning this approach, as rote writing discipline has been shown to be ineffective

The interrater reliability analysis (the degree of agreement among faculty members in the same field/degree) showed that the pretest (and posttest) used during this study was found reliable (20 items; from α=.69 to α=.76). Even though no long-term validity test applied to this instrument due to time constraint, internal consistency scores showed positive results (20 items; from α=.71 to α=.77. Also, all of the questions in pretest and posttest are correlated with the classroom management competencies listed in Florida's Teacher Certification Professional Examination (Table 3).

Table 3

Pre-test Post-test Question Groups

Classroom Management Competencies	Number of Questions
Competency 1. Classroom Rules and Procedures	2
Competency 2. Planning and Managing Student Homework	2
Competency 3. Classroom Organization	2
Competency 4. Planning and Managing First Day of School	1
Competency 5. Planning and Managing Cooperative Learning	1

Competency 6. Keeping Appropriate Behavior in Classroom	5
Competency 7. Dealing with Problem Behaviors	5
Competency 8. Communication Strategies for Teachers	2
Total	20

The content validity of the FTCE and FELE examinations is reinforced through the involvement of Florida educators, including teachers, district supervisors, teacher educators, and other education personnel, throughout the test development process.

Student Perception Survey

At the end of the study, all participants were asked to provide feedback on their experiences with the case-based learning approach by completing a survey. The survey's questions varied from the Likert scale (10 items) to open-ended questions (2 items). The researchers also added five additional questions regarding the gamified case-based online tool to be provided to the experimental group. These five additional questions focused on user experience with the online tool website. The interrater reliability analysis showed that the student survey created and used in this study was reliable (10 items: α=.67; 15 items: α=.61).

Research Procedures

During the study, the two sections of the course were taught by the same instructor in the same way they had been taught before (same content, activities, assignments, etc.). The only difference was that while one section completed a case-based learning activity via face-to-face classroom discussion, the other used the online tool. All students in both sections completed the task in the classroom during the scheduled class meeting time. Students and the instructor spent three weeks on this activity in both sections. The experimental group (online group) students were asked to bring their personal laptop computers. The instructor also provided information on borrowing a laptop from the college library if needed.

The experiment for the face-to-face discussion group started with students taking the pretest on the first day of the project. After collecting the pretest, the course instructor gave each student the cases as a hard copy. Six cases were distributed to students during the first session and seven cases during the second and last session (week). During each session, students were asked to develop a summary and prepare an individual response for each case. Then, students worked as a group to develop a consensus response for each case. The instructor then presented

each case on-screen and invited groups to discuss possible solutions students generated. At the end of the third session, students were asked to take the post-test and complete an online survey for their perception of the experiment.

The gamified online case-based instruction group also started by taking the pretest on the first day of the project. The course instructor then provided brief information on accessing the website, creating an account/login, and viewing and responding to the cases. The instructor also explained points, badges, rankings, and how to earn them. Then, the students were asked to start reading and responding to twenty initial cases online and move to other cases. During the last day of the activity, students were asked to take the posttest and student perception survey.

Results

Pre-test & Post-test Results

Before conducting the t-tests in our study, the researchers conducted thorough statistical analyses to ensure that the assumptions for this parametric test were met. The authors assessed the assumptions of normality and homogeneity of variances. The Shapiro-Wilk test for normality revealed that the data from both groups showed no significant deviations from normality ($p > 0.05$). Additionally, Levene's test for homogeneity of variances indicated that there were no significant differences in variances between the two groups ($p > 0.05$). These results indicated that our data met the essential assumptions for t-tests, including the assumption of normality and homogeneity of variances, allowing us to employ t-tests for our inferential statistical analyses confidently. Thus, the data met the required assumptions for the t-tests conducted in our study, ensuring the reliability and validity of our statistical findings.

To answer the first research question regarding comparing learning gains, researchers analyzed the pretest and posttest scores by calculating independent t-tests in SPSS. The independent t-test is an inferential statistical test that determines whether there is a statistically significant difference between the means in two unrelated groups (Box et al., 2005). The table below presents descriptive statistics and independent t-test analysis (Table 4).

Table 4

Overall Pretest & Posttest Score Comparison (Face-to-Face vs. Gamified Online)

Groups								
	Face-to-face Case-based Instruction (n= 45)		Gamified Online Case-based Instruction (n=42)		95% CI for Mean Difference			
	M	SD	M	SD		t	df	p
Pretest	7.84	1.52	7.71	1.36	-.488, .748	.419	85	.677
Posttest	15.98	1.93	19.05	0.96	-3.729, -2.411	-9.261	85	.001*

*p <.05.

Pretest comparisons showed no significant difference between the face-to-face and gamified online case-based instruction groups. In other words, the two groups seemed equal at the start of the experiment due to their pretest scores. When researchers compared the learning gains, the results showed that gamified online case-based instruction groups scored significantly higher on their post-test than the face-to-face case-based instruction group.

The researchers also compared the pretest and posttest scores based on classroom management competencies. The pretest comparison results showed no significant differences between the two groups in any of the competencies except for “Planning and managing cooperative learning”. For this competency, the online group scored higher than the face-to-face group. On the other hand, the results demonstrated significant differences in the two groups’ post-test comparison for all competencies. In other words, the gamified online group scored significantly higher than the face-to-face group in all competencies (Table 5).

Table 5

Competency-Based Pre- & Post-test Comparison (Face-to-face vs. Gamified Online)

	Groups	
	Face-to-face Case-based Instruction (n=45)	Gamified Online Case-Based Instruction (n=42)

	Mean	SD	*Mean*	SD	95% CI for Mean difference		t	df	p
Comp 1. Pretest	0.96	.208	0.90	.297	-.058	.160	.928	85	.356
Comp 1. Posttest	1.76	.435	2.00	.000	-.378	-.111	-3.64	85	.001*
Comp 2. Pretest	1.02	.260	1.07	.296	-.114	.111	-.028	85	.978
Comp 2. Posttest	1.84	.367	1.98	.154	-.253	-.010	-2.15	85	.034*
Comp 3. Pretest	0.13	.344	0.11	.328	-.129	.158	.198	85	.843
Comp 3. Posttest	1.78	.420	2.00	.000	-.351	-.093	-3.42	85	.001*
Comp 4. Pretest	0.33	.477	0.36	.485	-.229	.181	-.231	85	.818
Comp 4. Posttest	0.81	.318	1.00	.000	-.209	-.014	-2.26	85	.026*
Comp 5. Pretest	1.02	.260	0.90	.370	-.018	.253	1.72	85	.089
Comp 5. Posttest	0.82	.387	1.00	.000	-.296	-.059	-2.97	85	.004*
Comp 6. Pretest	1.42	.654	1.51	.707	-.390	.190	-685	85	.495
Comp 6. Posttest	3.69	.763	4.57	5.90	-1.17	-.590	-6.02	85	.001*
Comp 7. Pretest	1.98	.621	1.90	.656	-.199	.345	.533	85	.595
Comp 7. Posttest	3.38	.984	4.50	.634	-1.47	-.767	-6.27	85	.001*
Comp 8. Pretest	1.07	.213	1.12	.221	-096	.153	-.034	85	.865
Comp 8. Posttest	1.77	.387	2.00	.000	-.296	-.059	-2.97	85	.037*

*p <.05.

Competencies (1) Classroom Rules and Procedures, (2) Planning and Managing Student Homework, (3) Classroom Organization, (4) Planning and Managing the First Day of School, (5)

Planning and Managing Cooperative Learning, (6) Keeping Appropriate Behavior in Classroom, (7) Dealing with Problem Behaviors, (8) Communication Strategies for Teachers

Multivariate Analysis of Variance (MANOVA)

In order to determine if there were overall differences between the two groups (Face-to-face vs. Gamified Online) in terms of classroom management competencies, a MANOVA was conducted. This analysis takes into account the combined variance across all competencies. The overall MANOVA revealed a significant effect, indicating differences between the two groups across the combined competencies [Wilks' Lambda = 0.01, $F(8, 78) = 0.01$, $p < .05$]. This significant outcome prompted further univariate analyses to pinpoint the specific competencies driving this overall difference.

Univariate Analyses (ANOVAs)

Subsequent to the MANOVA, univariate ANOVAs were conducted for each competency to identify specific areas of difference between the two groups as well as within groups (Table 6).

Table 6

Univariate ANOVA Results for Classroom Management Competencies

Competencies	Source of variance	df	F	P
Competency 1. Classroom Rules and Procedures	Between Groups	1	13.26	.001*
	Within Groups	85		
Competency 2. Planning and Managing Student Homework	Between Groups	1	4.62	.034*
	Within Groups	85		
Competency 3. Classroom Organization	Between Groups	1	11.70	.001*
	Within Groups	85		
Competency 4. Planning and Managing First Day of School	Between Groups	1	5.11	.026*
	Within Groups	85		

Competency 5. Planning and Managing Cooperative Learning	Between Groups	1	8.81	.004*
	Within Groups	85		
Competency 6. Keeping Appropriate Behavior in Classroom	Between Groups	1	36.24	.001*
	Within Groups	85		
Competency 7. Dealing with Problem Behaviors	Between Groups	1	39.33	.001*
	Within Groups	85		
Competency 8. Communication Strategies for Teachers	Between Groups	1	8.81	.037*
	Within Groups	85		

For the competency of "Classroom Rules and Procedures" (Comp 1 Posttest), a significant difference was observed, $F(1, 85) = 13.26$, $p = .001$. Similarly, significant group differences were noted for "Planning and Managing Student Homework" (Comp 2 Posttest), $F(1, 85) = 4.62$, $p = .034$; "Classroom Organization" (Comp 3 Posttest), $F(1, 85) = 11.70$, $p = .001$; "Planning and Managing the First Day of School" (Comp 4 Posttest), $F(1, 85) = 5.11$, $p = .026$; "Planning and Managing Cooperative Learning" (Comp 5 Posttest), $F(1, 85) = 8.81$, $p = .004$; "Keeping Appropriate Behavior in Classroom" (Comp 6 Posttest), $F(1, 85) = 36.24$, $p = .001$; "Dealing with Problem Behaviors" (Comp 7 Posttest), $F(1, 85) = 39.33$, $p = .001$; and "Communication Strategies for Teachers" (Comp 8 Posttest), $F(1, 85) = 8.81$, $p = .037$.

These results indicate that the group undergoing the Gamified Online Case-Based Instruction outperformed their counterparts in the Face-to-face Case-based Instruction group across all the mentioned competencies in the posttest phase. This suggests that the gamified online platform may offer certain advantages or novel engagement methods that contribute to better comprehension or application of these classroom management principles. However, it's imperative to consider that while statistical significance has been achieved in these competencies, further qualitative assessments or feedback from participants could provide a

more holistic understanding of the practical implications of these findings in a real classroom setting.

Survey Results

The second research question focused on student perceptions regarding the application of face-to-face and gamified online case-based instruction. According to the results, both groups showed highly positive feedback about the case-based instruction. However, for statements 2, 3, 4, 7, and 9 gamified online, the case-based instruction group showed significantly higher scores than the face-to-face case-based instruction (Table 7).

Table 7

Student Survey Results

		Face-to-face		Gamified Online		Diff
#	Statement	Mean	SD	Mean	SD	
01	Case activity helped me develop a deeper understanding of classroom management concepts	4.36	0.61	4.50	0.59	.251
02	Case activity helped me have a better grasp of the practical application of core course concepts	3.67	0.62	4.40	0.59	.001*
03	Case activity helped me take a more active part in my learning process	4.09	0.64	4.55	0.59	.001*
04	Case activity helped me develop positive peer-to-peer relationships	4.27	0.62	4.50	0.55	.001*
05	Case activity helped me to be more engaged (motivated)	4.36	0.61	4.50	0.55	.252
06	Case activity helped me understand about the responsibility of the teacher establishing communication with students	4.42	0.58	4.45	0.63	.608
07	Case study helped me learn more about the resources available both inside and outside of the school	4.29	0.59	4.43	0.59	.001*

08	Case study helped me understand that each situation can be unique with multiple possible solutions	4.42	0.58	4.52	0.59	.594
09	Case study activity provides better retention of information	4.29	0.66	4.48	0.63	.001*
10	Case study activity was enjoyable	4.40	0.58	4.48	0.63	.401

Scale: 5 (Strongly Agree), 4 (Agree), 3 (Neutral), 2 (Disagree), 1 (Strongly Disagree)

* Shows significant difference from other groups (p = .05)

The researchers also added specific questions regarding the online tool, which were only provided to the online tool group. The results were highly positive (Table 8).

Table 8

Survey Results Regarding Online Tool

		Gamified Online Group	
#	Statement	Mean	SD
01	Website used for this activity looks clean and functions well	4.67	0.48
02	Prompts, guides, and examples integrated into the website were helpful	4.57	0.59
03	The reward system (gamification) integrated into the website was engaging	4.83	0.38
04	Features such as voting, commenting, and favoriting member posts integrated into the website were engaging	4.81	0.40
05	I recommend the use of the website and case studies for the future students of this course	4.90	0.30

Scale: 5. Strongly Agree, 4. Agree, 3. Neutral, 2. Disagree, 1. Strongly Disagree.

Discussion

Case-based learning, as defined by Goeke (2008), Harrington (1995), and Leenders and colleagues (2001), revolves around analyzing scenarios in organizations, that often pose decisions or challenges. These cases stimulate critical thinking, promoting professional thought

processes and application of theoretical concepts (Dowd & Davidhizar, 1999; Herreid, 2004). In teacher education, this method traditionally involves reading cases, writing responses, and classroom discussions, fostering student-teacher interaction and collaborative solution-finding (Levin, 2002; Manouchehri & Enderson, 2003; Mastrilli & Sardo-Brown, 1999, 2002; Sudzina, 1999). However, there are many challenges in implementing case-based learning in teacher education program courses, such as limited class time to discuss cases, lack of equal student participation, and lack of anonymity for students to express their ideas and views (Cohen & Martin, 2023). Attempts to use online forums to address these challenges have encountered their issues, like digressions and lack of effective gamification (Aldhayan, 2021; Hewitt, 2003; Medler & Magerko, 2011; Reischer et al., 2017; Sahab et al., 2021; Silverman et al., 1992; Unal, & Unal, 2017). Literature investigation showed that some researchers attempted to use online discussion forums to overcome case-based classroom learning challenges. However, the results of these studies also showed new challenges and limitations, such as students going off-topic during online discussions, posting only agreement messages rather than solutions to cases, excessive student focus on only newly published cases, lack of marking posts as solutions or comment to solutions, lack of gamification, etc. (Hewitt, 2003; Medler & Magerko, 2011; Reischer et al., 2017; Silverman et al., 1992; Unal et al., 2016).

The main result of this study was that the overall case-based learning activity was certainly a positive experience for both groups (face-to-face and online) in terms of learning gains and student satisfaction. This result was harmonious with and confirmed the other studies discussing the potential benefits of case-based instruction (Diamantes & Ovington, 2003; Kolodner, 1997; Kolodner & Simpson, 1989; Zottmann et al., 2012). Comparing face-to-face and gamified online case-based learning, we found that students who used the online platform showed better learning outcomes. They had access to more cases and felt more motivated and engaged. Unlike the traditional classroom, the online platform allows students to choose what they learn, go at their own pace, and share their thoughts anonymously. Plus, they could discuss real-life situations and solutions, which helped them prepare for their future careers.

On the other hand, an analysis of student perceptions via survey responses revealed nuanced differences between the two instructional formats. While participants in both groups generally expressed positive perceptions of case-based learning, the online group exhibited notably more favorable perceptions in certain areas. Specifically, students in the online group

reported enhanced abilities to apply course concepts to real-life situations, retain information better, engage in positive peer interactions, regulate their learning process, and access resources both within and outside the school environment. Additionally, students appreciated the gamified platform for fostering student-student interaction through solution posting and in-depth discussions, enhancing collaborative learning experiences beyond what was feasible in the face-to-face setting.

Student Achievement

To evaluate and compare the effectiveness of the case study teaching face-to-face versus online, pretest and posttest questions aligned with the classroom management competencies listed on the Florida Teacher Certification Examination - FTCE (Professional Knowledge) were used. Pretest and post-test data analysis showed that learning gains were significantly higher for the gamified online case-based group when compared with face-to-face. In addition, a comparison of learning gain by competencies also showed that the gamified online group scored higher than the face-to-face in all competencies. Several reasons might contribute to the significant difference between the face-to-face and online formats.

As indicated before, one of the difficulties with implementing case-based instruction was "managing time to cover a lot of cases" because each case requires an extensive discussion during the class sessions. Even though the cases and FTCE classroom management competencies are carefully selected, the three-week timeline did not allow time to discuss other possible cases or issues. The online platform brought the possibility of covering much more than the twenty cases selected by the instructor. Students could work on not only the teacher-selected twenty cases and many more cases available in the system for students to read, respond to, rate, or comment on. Another contributing factor to the success of the online format can be explained by its positive impact on student motivation, participation, and deep learning.

Jones (2009) proposed the MUSIC model of student motivation, emphasizing five key factors: Empowerment, Usefulness, Success, Interest, and Caring, which instructors should consider when designing instruction. In this study, researchers argue that the online platform effectively addressed all components of student motivation. For instance, regarding empowerment, the online platform allowed students to select learning materials, control their learning pace, and express opinions anonymously, unlike the face-to-face format. Furthermore, the platform demonstrated usefulness by exposing students to relevant real-world scenarios and

career-related challenges, fostering a sense of practical application not readily available in traditional classroom settings. Success was promoted through structured learning activities, gradually increasing in difficulty to ensure a sense of competence as students progressed. The gamification aspect of the online platform catered to student interests, providing motivational incentives such as earning points and badges, which were absent in face-to-face instruction. Lastly, the online format facilitated a caring environment by enabling open communication, including anonymous participation, and fostering a supportive community where students could engage with and learn from one another.

The discussion of this study emphasizes several practical implications arising from the research findings. One significant outcome is the development of an online tool that has been widely adopted across various educational institutions and settings. This tool serves as a valuable resource for teacher educators, who incorporate it into their courses and field experiences, as well as for practicing teachers seeking assistance with classroom management and other professional challenges. User feedback has prompted the expansion of the tool to cover additional topics beyond classroom management, with continuous additions of hundreds of cases and improvements based on user suggestions.

Furthermore, the study underscores the efficacy of using case-based teaching approaches in fostering student responsibility for learning. While cases offer a refreshing alternative to traditional lectures and prompt students to apply their knowledge in real-world scenarios, they are not intended to replace lectures entirely. Instead, they complement traditional instructional methods by encouraging the development of critical thinking and problem-solving skills.

Moreover, the study emphasizes the importance of a well-structured online learning environment promoting robust student interaction. Features such as extensive case discussions, peer solution evaluation, and incentives for active participation contribute significantly to enhanced learning outcomes. By leveraging technology to facilitate meaningful engagement and collaboration, educators can effectively harness the potential of case-based learning approaches to elevate student learning experiences and outcomes.

Student Perceptions

The analysis of the student survey showed that participants in both groups showed overall positive perceptions and generally agreed that case-based learning was enjoyable. The experience helped them develop a deeper understanding of classroom management concepts,

have a better grasp of the practical application of core course concepts, take a more active part in their learning process, develop better peer-to-peer relationships, become more engaged/motivated, understand the teacher-student relationship better, learn about resources available in and out of the classroom, understand that each situation can be unique with multiple possible solutions and increase their retention of information. The scores varied from 3.67 to 4.55.

On the other hand, looking at the score differences between the two groups on the student perception survey, researchers found out that for some of the survey items (2, 3, 4, 7, 9), the online group showed significantly more positive perceptions than the face-to-face group. Specifically, students in the online group indicated that the experiment helped them to (a) learn how to apply course concepts to real life, (b) gain better retention of information, (c) experience positive peer-to-peer interaction, (d) control their learning process, and (e) be aware of resources available in and outside of the school. The researchers suggest that the advantages of implementing case-based activity using an online platform can explain the score differences.

Students indicated that the numerous cases posted on the online platform made them think about countless situations that may happen in their classrooms and that they had a chance to apply what they learned in class to real-life situations. The relevance of the case studies points to authentic learning (Herrington et al., 2010). Authentic learning experiences comprise complex tasks that have real-world connections. The relevance of the cases may have affected student motivation. Relevance is recognized as an important factor in student motivation by many motivation theories and models, such Expectancy-Value Theory (Atkinson, 1964) and the ARCS design (Keller, 1987). Students also expressed how the case-based instruction helped them be aware of multiple perspectives and change their epistemological beliefs about knowledge (i.e., there might be multiple truths in the world, which are constructed among people involved). The online platform also allowed students to see how other students would approach the problems described in the cases. This was evident in some comments where students expressed their thoughts about a response with phrases like “I did not consider the issue from that angle” or “I had not considered how beneficial it would be to move from A to B.” This also helped students to unlearn the tendency of always looking for the right answer instead of looking at the problems from multiple perspectives using multiple solutions (critical thinking).

Students in the online group also agreed that the gamified platform provided an environment to support student-student interaction. They could post solutions and have an extensive discussion under each possible solution as to whether they agreed with the solution with an explanation. Students could see why someone agreed with them, obtain further ideas to enhance their solutions, and ultimately consider details they may have missed when they responded to the case. Such interaction can enhance a person's self-efficacy, especially when their perspectives are validated by praise and agreement statements. Cherubini (2009) used case studies to enhance preservice teachers' critical thinking skills and found, as a result of his analysis of participants' reflections on the process, that using case studies increased self-confidence. In addition, he discovered that his participants challenged stereotypes and promoted social cohesion through their responses.

Providing students with many case studies from which they could choose the ones they want to respond to gives them a sense of autonomy. Cases were written on a variety of issues. Therefore, if students were uncomfortable responding to cases on a certain topic, they could find cases on many other topics. Moreover, the technology used in the study allowed the students to see others' responses, which may have given them a sense of security when they saw responses from people with similar perspectives on these controversial issues.

Literature on using gamification strategies in the classroom suggests that timely and frequent feedback increases user engagement with certain activities (Lee & Hammer, 2011; Sicart, 2008). This hypothesis is supported by data from this study, where student buy-in was at its highest when students could monitor their performance on a leaderboard as they gained points for the activities they participated in the project (posting a case, responding to a case, rating solutions, etc.) and received progress reports with detailed information about their point total. Another factor that may have affected student motivation is that students' responses to cases were published on a website. Students with an audience beyond the teacher for their work will likely be more motivated.

Finally, the website setup may have contributed to the positive feedback from students. Many students mentioned how easy it was for students to navigate the website. Students could view the case studies with two clicks. They could check the points they accumulated with an additional click. The website's design made it very predictable for the students to move from one

place to the next. Therefore, the simplicity of the website was a positive aspect of the online platform.

One of the most practical implications of this study is that the study helped researchers create an online tool that is now publicly available for free to all educators. The tool is now being used by many institutions and educators worldwide. The variation of people and cultures also provides different perspectives from different cultures/countries. Teacher educators are integrating the tool into their courses and field experiences, and teachers are using the cases to seek help on their difficulties in classroom management and other areas. The users requested that researchers add sections for different topics to create different cases in addition to classroom management. Currently, the topics are assessment, dealing with parents, dealing with ESOL students, multicultural education (diversity), dealing with parents, teaching job interviews, and ethics. Hundreds of cases are added to the tool, and more are added daily. The researchers will keep the tool available for all educators (free) and improve it as future users offer suggestions.

The study's results demonstrated that using cases can be a refreshing teaching approach and help students take much more responsibility for their learning. However, because cases are not necessarily the best way to communicate large amounts of new information, they should be seen as something other than lecture replacements. By placing students in real-life situations and asking them to make critical decisions, case studies force students to connect their knowledge of facts with the need for evaluative skills. On top of that, when students are provided with a well-structured online environment where they interact with each other, discuss each case extensively, rate/comment on each other's solutions, and earn points and badges for their participation, the results can be much better.

Historically, classroom management education for preservice teachers primarily employed conventional lecture-based methods, where theoretical principles were presented linearly without much emphasis on real-world application. These traditional methods, though foundational, often left students with a gap between theoretical understanding and practical application. Recognizing this challenge, face-to-face case-based teaching methods were introduced as a more interactive and context-driven alternative. By presenting preservice teachers with real-world classroom scenarios, this approach allowed for bridging theory and practice. Students could actively engage in problem-solving, reflecting on best practices and collaboratively discussing potential solutions. The improvement seen with face-to-face case

studies was evident in enhanced critical thinking skills, a deeper understanding of classroom management principles, and increased preparedness for real-world teaching scenarios. With the evolution of digital technologies, the case-based approach has been adapted to the online gamified setting to further amplify its benefits. Our study indicates that the Gamified Online Case-Based Instruction outperformed the traditional face-to-face case-based method across various competencies. This suggests that while the case-based pedagogy remains consistent, the delivery medium significantly enhances its effectiveness. The gamified online platform offers a more engaging, immersive, and interactive learning experience, leading to better comprehension and application of classroom management principles. Thus, the trajectory from traditional lecture-based methods to face-to-face case studies, and now to gamified online case studies, underscores a continuous pursuit of enhancing instructional methods to prepare preservice teachers for their future classrooms best.

Limitations

This study had limitations. The data were collected from undergraduate students in a single institution and a single course. Including participants from other courses and/or institutions where the course content is taught differently can reveal insights and make results more generalizable.

In addition, the study did not delve into the long-term retention of knowledge or the application of acquired skills in a real classroom setting post-graduation. Another limitation is the potential for the novelty effect, where students might have responded more positively to the online platform simply because it's a new experience. Additionally, the platform's success may not necessarily translate to all subjects or courses, limiting its generalizability.

In addressing the engagement outside of classroom parameters, our monitoring data revealed that a noteworthy fraction of students using the gamified version engaged with the program beyond regular class hours. Specifically, we observed metrics such as login frequencies, durations of engagement, and the number of cases accessed during unscheduled times. An intriguing pattern emerged from our analysis: students who interacted more frequently with the gamified module outside of class generally demonstrated superior outcomes on subsequent assessments. Nonetheless, it's crucial to underscore that this correlation does not necessarily equate to causation. The amplified engagement might indeed contribute to elevated scores; however, other potential influencers, such as inherent motivation or the inherent efficacy of the

gamified design, cannot be dismissed. More controlled studies are envisaged in future research endeavors to further dissect this relationship and gauge the precise influence of engagement duration on assessment scores. The insights from such studies will be invaluable in fine-tuning the efficacy of our gamified educational tools.

Future Research

Based on the findings of this study, several recommendations for future research emerge. Firstly, further investigations should explore the application of gamified online case-based learning across diverse educational contexts beyond teacher education. Assessing its effectiveness in various disciplines and educational levels could illuminate its adaptability and impact on different student populations. Secondly, future studies could delve into the design and integration of gamified elements within online case-based learning platforms. Understanding how specific gamification features influence student motivation and learning outcomes can inform educators in tailoring their instructional approaches effectively.

Moreover, researchers should examine the challenges and limitations associated with gamified online case-based learning, including issues like online etiquette, student accountability, and managing large-scale discussions. Identifying strategies to address these challenges and enhance the overall online learning experience is essential. Additionally, comparative studies could investigate the cost-effectiveness of gamified online case-based learning platforms compared to traditional face-to-face instruction and other online teaching methods, offering valuable insights for institutional decision-making.

Lastly, as technology evolves, future research could explore the integration of emerging technologies like virtual reality or artificial intelligence into gamified online case-based learning platforms. This exploration aims to further enhance student engagement and learning experiences. By pursuing these research avenues, educators and policymakers can optimize the use of gamified online case-based learning to improve educational outcomes and foster student motivation effectively.

Conclusion

Case-based learning has emerged as a critical and innovative methodology in teacher education, often underscored by its ability to evoke critical thinking and bridge theoretical concepts with real-world scenarios. This study delved into comparing traditional face-to-face case-based learning against using a novel gamified online platform. The results support the

efficacy of the online approach. It was observed that the gamified online platform enhanced learning outcomes and aligned with the MUSIC model of motivation. The online platform fortified each component of this model, allowing for empowerment in learning choices, emphasizing the real-world relevance of the content, endorsing student successes, keeping interests alive through gamification, and fostering a caring environment through peer interaction and feedback. Moreover, the student perceptions highlighted the gamified platform's capability to facilitate real-world applicability, retention of information, enhanced peer interactions, autonomy in learning, and awareness of external resources. The platform's design enhances motivation, and its user-friendly interface and accessibility further bolster its attractiveness. Importantly, the broader acceptance and usage of the online tool at teacherserver.com showcase its potential and success.

References

Adhikari, N. (2021). Pedagogical approaches for effective classroom management. *Interdisciplinary Research in Education, 6*(1), 45-56. https://doi.org/10.3126/ire.v6i1.43421

Aldhayan, M. (2021). *Online Peer Support Groups to Combat Digital Addiction: Acceptance Factors, Design Features, and Guidelines* (Doctoral dissertation, Bournemouth University).

Anwar, S., Wati, D., & Supriadi, U. (2022). A comparative study of student learning motivation with sevima edlink and google classroom-based classroom management. *Qalamuna Journal Pendidikan Social Dan Agama, 14*(2), 232-250. https://doi.org/10.37680/qalamuna.v14i2.1387

Atkinson, J. W. (1964). *An introduction to motivation*. Van Nostrand.

Ayers, W. (2001). *To teach: The journey of a teacher*. Teachers College Press.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change, *Psychological Review, 84*, 191-215.

Bell, A., & Morris, G. (2009). Engaging professionals in online learning. *Australian Journal of Educational Technology*, *25*(5), 700-713.

Box, G., Hunter, W., & Hunter, S. (2005). *Statistics for Experimenters: Design, Innovation, and Discovery* (2nd ed.). Wiley-Interscience.

Britt, A. (1997). *Perceptions of beginning teachers: Novice teachers reflect upon their beginning experiences*. (ERIC Document Reproduction Service No. ED415218).

Brophy, J. (1988). Educating teachers about managing classrooms and students. *Teaching and Teacher Education, 4*(1), 1-18.

Bunchball, A. (2010). *Gamification 101: An introduction of the use of game mechanics to influence behavior.* http://goo.gl/tMvkV0

Bushaw, W., & Gallup, A. (2008). Americans speak out. Are educators and policy makers listening? *Phi Delta Kappan, 90*(1), 9-20.

Butler, M. B., Lee, S., & Tippins, D. J. (2006), Case-based methodology as an instructional strategy for understanding diversity: Preservice teachers' perceptions. *Multicultural Education, 13*(3).

Cakmak, M. (2008). Concerns about teaching process: Student teacher's perspectives. *Education Research Quarterly, 31*(3), 57-77.

Carter, D. R., & Van Norman, R. K. (2010). Class-wide positive behavior support in preschool: Improving teacher implementation through consultation. *Early Childhood Education, 38*, 279-288.

Cherubini, L. (2009). Exploring prospective teachers' critical thinking: Case-based pedagogy and the standards of professional practice. *Teaching and Teacher Education, 25*, 228- 234.

Chi, M. T., Glaser, R., & Rees, E. (1982). *Expertise in problem-solving*. In R. J. Sternberg (Ed.), Advances in the psychology of human intelligence (pp. 7-77). Erlbaum.

Cohen, G., & Martin, N. (2023). High-Tech Classroom Management: Effects of the Use of an App on Disruptive and On-Task Classroom Behaviours for Students with Emotional and Behavioural Disorder, *Behavioral Sciences, 13*(1). 23-38.

Cook, T.D., & Campbell, D.T. (1979). *Quasi-Experimentation: Design and Analysis for Field Settings*. Rand McNally.

Cooper, J. T., N. A. Gage, P. J. Alter, S. LaPolla, A. MacSuga-Gage, A.S., & T. M. Scott. (2018). Educators' self-reported training, use, and perceived effectiveness of evidence-based classroom management practices. *Preventing School Failure: Alternative Education for Children and Youth 62*(1), 13-24. doi: 10.1080/1045988X.2017.1298562.

Delwiche, A. (2006). Massively multiplayer online games (MMOs) in the new media classroom. *Educational Technology & Society, 9*(3), 160-172.

Deterding, S., Khaled, R., Nacke, L.E., & Dixon, D. (2011). *Gamification: Toward a Definition*. In CHI 2011 Gamification Workshop Proceedings, Vancouver, BC, Canada.

Diamantes, T., & Ovington, J. (2003). Storytelling: Using a case method in administrator preparation programs. *Education, 123*, 451-469.

Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in education: a systematic mapping study. *Educational Technology & Society, 18*(3), 75-88.

Domitrovich, C. E., Gest, S. D., Jones, D., Gill, S., & Sanford DeRousie, R. M. (2010). Implementation quality: Lessons learned in the context of the Head Start REDI trial. *Early Childhood Research Quarterly, 25*, 284-298.

Dowd, S. B., & Davidhizar, R. (1999). Using case studies to teach clinical problem-solving. *Nurse Educator, 24*(5), 42-46.

Doyle, W. (1986). *Classroom organization and management*. In M. C. Wittrock (Ed.), Handbook of research on teaching (3rd ed.). MacMillan.

Elksnin, L. (1998). Use of the case study method of instruction in special education teacher preparation programs: A preliminary investigation. *Teacher Education and Special Education*, *21*(2), 95-108.

Elksnin, L. (2001). Implementing the case method of instruction in special education teacher preparation programs. *Teacher Education and Special Education, 24*(2), 95-107.

Emmer, E. T., Evertson, C., & Worsham, M. E. (2000). *Classroom management for secondary teachers* (5th ed.). Allyn and Bacon.

Emmer, E. T., & Stough, L. M. (2001). Classroom management: A critical part of educational psychology, with implications for teacher education. *Educational Psychologist, 36*(2), 103–112. https://doi.org/10.1207/S15326985EP3602_5

Erdem, E., & Erdem, E. (2021). Challenges faced by classroom teachers in multigrade classrooms: a case study. *Journal of Pedagogical Research, 5*(4), 76-91. https://doi.org/10.33902/jpr.2021473490

Fideler, E., & Haskelhorn, D. (1999). *Learning the ropes: Urban teacher induction programs and practices in the United States.* Recruiting New Teachers.

Florida Department of Education. (2023). Florida Teacher Certification Examination - Professional Education Test. Florida Department of Education.

Ganser, T. (1999). Under their wing: Promises and pitfalls of mentoring. *The High School Magazine, 7*, 7-13.

Gao, F., Zhang, T., & Franklin, T. (2013). Designing asynchronous online discussion environments: recent progress and possible future directions. *The British Journal of Educational Technology, 44*(3), 469-483.

Gee, J.B. (2001). What graduates in education fear most about their first year of teaching. Baton Rouge, LA: Louisiana Educational Research Association (ERIC Document Reproduction Service No. ED 454 161).

Gencer, A. S., & Cakiroglu, J. (2007). Turkish preservice science teachers' efficacy beliefs regarding science teaching and their beliefs about classroom management, *Teaching and Teacher Education, 23*(5), 664-675.

Goeke, J. (2008). A preliminary investigation of prospective teachers reasoning about case studies with expert commentary. *Teacher Education and Special Education, 31*(1), 21-35.

González-Fernández, A., Revuelta-Domínguez, F. I., & Fernández-Sánchez, M. R. (2022). Models of instructional design in gamification: A systematic review of the literature. *Education Sciences, 12*(1), 44.

González-González, I., Gallardo-Gallardo, E., & Jiménez-Zarco, A.I. (2014). Using films to develop the critical thinking competence of the students at the Open University of Catalonia (UOC): testing an audiovisual case methodology in a distance e-learning environment. *Computers in Human Behavior, 30*, 739-744. https://doi.org/10.1016/j.chb.2013.09.013

Gravett, S., Beer, J. d., Odendaal-Kroon, R., Merseth, K. K. (2017). The affordance of case-based teaching for the professional learning of student-teachers. *Journal of Curriculum Studies, 49*(3), 369-390. https://doi.org/10.1080/00220272.2016.1149224.

Grebner, S., Elfering, A., & Semmer, N. K. (2010). *The success resource model of job stress*. In P. L. Perrewe, & D. C. Ganster. Research in occupational stress and well-being: Vol. 8. New developments in theoretical and conceptual approaches to job stress (p. 61-108). Emerald Group Publishing

Greenwood, G. E., & Fillmer, H. T. (1999). *Educational psychology cases for teacher decision-making*. Merrill.

Hakaya, M., Mbukusa, N., & Mudabeti, E. (2021). Managing English language classroom for

meaningful teaching and learning: a case study for Hochland High School in Windhoek. *Frontiers in Education Technology, 4*(4), 1-11. https://doi.org/10.22158/fet.v4n4p1

Halford, J. (1998). Easing the way for new teachers. *Educational Leadership, 55*(5), 33-36.

Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education, 80*, 152-161.

Harrington, H. (1995). Fostering reasoned decisions: Case-based pedagogy and the professional development of teachers. *Teaching and Teacher Education, 11*, 203-214.

Harrington, H. L., Quinn-Leering, K., & Hodson, L. (1996). Written case analyses and critical reflection. *Teaching and Teacher Education, 12*(1), 25-37.

Hattie, J. (2009). *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Hemphill, M. A., Richards, K. A. R., Gaudreault, K. L., & Templin, T. J. (2015). Pre-service teacher perspectives of case-based learning in physical education teacher education. *European Physical Education Review, 21*(4), 432-450. DOI: 10.1177/1356336X15579402

Hester, P. T., & Adams, K. (2017). *Systemic decision making: Fundamentals for addressing problems and messes* (2nd ed.). Springer International Publishing.

Herreid, C. F. (2004). Can case studies be used to teach critical thinking? *Journal of College Science Teaching, 33*(4), 12-14.

Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development, 48*(3), 23-48.

Herrington, J., Reeves, T.C., & Oliver, R. (2010). *A Guide to Authentic e-Learning*. Routledge.

Hewitt, J. (2003). How habitual online practices affect the development of asynchronous discussion threads. *Journal of Educational Computing Research, 28*(1), 31-45.

Houston, W. R., & Williamson, J. (1993). Perceptions of their preparation by 42 Texas elementary school teachers compared with their responses as student teachers. *Teacher Education and Practice, 8*(2), 27-42.

Hoy, A. W., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures, *Teaching and Teacher Education, 21*(4), 343-356.

Huang, H. Y. W., & Soman, D. (2013). *A Practitioner's Guide to Gamification of Education.* Research Report Series: Behavioral Economics in Action. The University of Toronto, Rotman School of Management.

Hunt, B. C. (2009). *Teacher effectiveness: A review of the international literature and its relevance for improving education in Latin America*. PREAL.

Iqbal, A., Gungor, A., & Zeb, A. (2021). Classroom management practices of secondary school teachers in district Swat. *Journal of Social Sciences Review, 1*(1), 13-27. https://doi.org/10.54183/jssr.v1i1.6

Jacques, K. (2000). Solicitous tenderness: Discipline and responsibility in the classroom. In H. Cooper and R. Hyland (Eds.) *Children's perceptions of learning with trainee teachers*. (166-177). Routledge.

Jeong, A., & Frazier, S. (2008). How day of posting affects level of critical discourse in asynchronous discussions and computer supported collaborative argumentation. *The British Journal of Educational Technology, 39*(5), 875-887.

Johler, M., Krumsvik, R., Bugge, H., & Helgevold, N. (2022). Teachers' perceptions of their role and classroom management practices in a technology-rich primary school classroom. *Frontiers in Education, 7*, 1-13. https://doi.org/10.3389/feduc.2022.841385

Jones, B. D. (2009). Motivating students to engage in learning: The MUSIC Model of Academic Motivation. *International Journal of Teaching and Learning in Higher Education, 21*(3), 272-85.

Jones, V. (2006). How do teachers learn to be effective classroom managers? In C. M. Evertson & C. S. Weinstein (Eds.), *Handbook of Classroom Management: Research, Practice, and Contemporary Issues* (pp. 887-908). Lawrence Erlbaum.

Jones, V., & Jones, L. (2010). *Comprehensive Classroom Management* (9th ed.). Prentice-Hall.

Jong, M. S. Y., Shang, J. J., Lee, F. L., Lee, J. H. M., & Law, H. Y. (2006). An exploratory study on teachers' perceptions of game-based situated learning. In R. Mizoguchi, P. Dillenbourg, & Z. Zhu (Eds.), *Learning by effective utilization of technologies: Facilitating intercultural* (pp. 525-532). IOS Press.

Kaur, G., Rehncy, J., Kahal, K. S., Singh, J., Sharma, V., Matreja, P. S., & Grewal, H. (2020). Case-based learning as an effective tool in teaching pharmacology to undergraduate medical students in a large group setting. *Journal of Medical Education and Curricular Development, 13*(7). doi: 10.1177/2382120520920640

Kavrayici, C. (2021). The relationship between classroom management and the sense of classroom community in graduate virtual classrooms. *Turkish Online Journal of Distance Education, 22*(2), 112-125. https://doi.org/10.17718/tojde.906816

Keller, J. M. (1987). Development and use of the ARCS model of motivational design. *Journal of Instructional Development, 10*(3), 2-10.

Kim, S., Phillips, W. R., Pinsky, L., Brock, D., Phillips, K., & Keary, J. (2006). A conceptual framework for developing teaching cases: A review and synthesis of the literature across disciplines. *Medical Education, 40*(9), 867-876.

Kolodner, J. L. (1997). Educational implications of analogy: A view from case-based reasoning. *American Psychologist, 52*, 57-66.

Kolodner, J. L., & Simpson, R. L. (1989). The mediator: Analysis of an early case-based reasoner. *Cognitive Science, 13*, 507-549.

Kretlow, A. G., & Bartholomew, C. C. (2010). Using coaching to improve the fidelity of evidence-based practices: A review of studies. *Teacher Education and Special Education, 33*, 279-299.

Ladd, K. L. (2000). *A comparison of teacher education programs and graduates' perceptions of experiences*. Dissertation Abstracts International (University Microfilms No. 9998491).

Lee, J., & Hammer, J. (2011). Gamification in education: What, how, why bother? *Academic Exchange Quarterly, 15*(2), 146.

Leenders, M.R., Mauffette-Leenders, L.A., & Erskine, J.A. (2001). *Writing Cases*. 4th edition. Ivey Publishing, Ivey Business School.

Levin, B. B. (1995). Using the case method in teacher education: The role of discussion and experience in teachers' thinking about cases, *Teaching and Teacher Education, 11*(1), 63-79.

Levin, B. B. (2002). Dilemma-based cases written by preservice elementary teacher candidates: An analysis of process and content. *Teaching Education, 13*(2), 203-18.

Lewis, R., Romi, S., & Roache, J. (2011). Coping styles as mediators of teachers' classroom management techniques. *Research in Education, 85*, 53-68.

Lewis, R., Romi, S., & Roache, J. (2012). Excluding students from the classroom: Teacher techniques that promote student responsibility. *Teaching and Teacher Education, 28*, 870-878.

Long, A., Miller, F., & Upright, J. (2019). Classroom management for ethnic–racial minority students: a meta-analysis of single-case design studies. *School Psychology, 34*(1), 1-13. https://doi.org/10.1037/spq0000305

Manouchehri, A., & Enderson, M. C. (2003). The utility of case study methodology in mathematics teacher preparation. *Teacher Education Quarterly, 30*(1), 113-35.

Mastrilli, T., & Sardo-Brown, D. (1999). Elementary student teachers' cases: An analysis of dilemmas and solutions. *Action in Teacher Education, 21*(1), 50-60.

Mastrilli, T., & Sardo-Brown, D. (2002). Novice teachers' cases: A vehicle for reflective practice. *Education, 123*(1), 56-62.

McCormack, A. C. (2001). Investigating the Impact of an Internship on the Classroom Management Beliefs of Preservice Teachers. *The Professional Educator, 23*(2), 11-22.

Meacham, J.A., & Emont, N.C. (1989). The interpersonal basis of everyday problem-solving. In J.D. Sinnott (Ed.), *Everyday problem solving: Theory and applications* (pp. 7-23). Praeger.

Medler, B., & Magerko, B. (2011). Analytics of play: Using information visualization and game-play practices for visualizing video game data. *Parsons Journal for Information Mapping, 3*(1), 1-12.

Merseth, K. K. (1990). The early history of case-based instruction: Insights for teacher education today. *Journal of Teacher Education*, *42*(4), 2433-2439.

Merseth, K. K. (1991). Case studies and teacher education. *Teacher Education Quarterly, 17*(1), 53-62.

Mireles-Rios, R., Becchio, J. A., & Roshandel, S. (2019). Teacher evaluations and contextualized self-efficacy: Classroom management, instructional strategies, and student engagement. *Journal of School Administration Research and Development 4* (1), 6 -17. doi: 10.32674/jsard.v4i1.1938.

Mostert, M. P. (2007). Challenges of case-based teaching. *The Behavior Analyst Today, 8*(4), 434-442. https://doi.org/10.1037/h0100632.

Nieto-Escamez, F. A., & Roldán-Tapia, M. D. (2021). Gamification as online teaching strategy during COVID-19: A mini-review. *Frontiers in Psychology, 12*, 648552.

Nousiainen, T., Vesisenaho, M., Ahlstrom, E., Peltonen, M., Fort, S., & Gómez, S. (2020). *Gamifying teacher students' learning platform: information and communication technology in teacher education courses*. In Eighth International Conference on Technological Ecosystems for Enhancing Multiculturality (pp. 688-693).

Oliveira, W., Hamari, J., Shi. L., Toda, A. M., Rodrigues, L., Palomino, P. T., & Isotani, S. (2023). Tailored gamification in education: A literature review and future agenda. *Educational Technology Research and Development, 71*(1), 373-406. https://doi.org/10.1007/s10639-022-11122-4

O'Neill, S., & Stephenson, J. (2012). Does classroom management coursework influence pre-service teachers' perceived preparedness or confidence? *Teaching and Teacher Education, 28*, 1131-1143. http://dx.doi.org/10.1016/j.tate.2012.06.008

O'Neill, S. C., & Stephenson, J. (2014). Evidence-based classroom and behaviour management content in Australian pre-service primary teachers' coursework: Wherefore art thou? *Australian Journal of Teacher Education, 39*(4), 1-22.

Oratmangun, R. (2021). Teacher's roles as classroom manager and classroom instructor. *Cerdika Jurnal Ilmiah Indonesia, 1*(2), 164-170. https://doi.org/10.36418/cerdika.v1i2.24

Paramita, P., Andriani, F., Handayani, M., & Rusli, R. (2023). Teacher participation in professional learning programs in classroom behavior management. *Journal Prima Edukasia, 11*(1), 96-105. https://doi.org/10.21831/jpe.v11i1.53637

Pigge, F. L., & Marso, R.N. (1997). A seven-year longitudinal multi-factor assessment of teaching concerns development through preparation and early years of teaching. *Teaching and Teacher Education, 13*(2), 225-235.

Pindiprolu, S. S., Peterson, S. M. P., Rule, S., & Kraft, B. (2003). Using Web-mediated experiential case-based instruction to teach functional behavioral assessment skills. *Teacher Education and Special Education, 26* (1), 11-16.

Purwanti, E., & Vania, G. (2021). Classroom management: applying appropriate strategies to enhance effective teaching. *Journal of Foreign Language Teaching and Learning, 6*(1), 78-93. https://doi.org/10.18196/ftl.v6i1.10638

Recard, M., & Nathania, Y. (2021). The implementation and the impact of attention grabbers in young learners' classrooms: a case study. *Teknosastik, 19*(1), 1-12. https://doi.org/10.33365/ts.v19i1.586

Reischer M., Khalil M., & Ebner M. (2017). Does Gamification in MOOC Discussion Forums Work? In C. Delgado Kloos, P. Jermann, M. Pérez-Sanagustín, D. Seaton, & S. White (Eds.), *Digital Education: Out to the World and Back to the Campus. EMOOCs 2017. Lecture Notes in Computer Science, Vol 10254* (pp. 95-101). Springer, Cham. https://doi.org/10.1007/978-3- 319-59044-8_11

Rippin, A., Booth, C., Bowie, S., & Jordan, J. (2002). A complex case: using case method to explore uncertainty and ambiguity in undergraduate business education, *Teaching and Higher Education, 7*(4), 429-41.

Rosas, C., & West, M. (2009). Teachers Beliefs about Classroom Management: Pre-Service and Inservice Teachers' Beliefs about Classroom Management. *International Journal of Applied Educational Studies, 5*, 54-61.

Sahab, S., Haqbeen, J., & Ito, T. (2021). What makes a Participative Tool Elicit More Sample Views? Discussion with Supportive Means for Mutual Benefit. In *REAL CORP 2021 Proceedings/Tagungsband* (pp. 7-10). https://www.corp.at

Saleem, A., Muhammad, Y., & Masood, S. (2020). Classroom management challenges and administrative support in elementary schools: experiences of novice public-school teachers. *UMT Education Review, 3*(2), 29-46. https://doi.org/10.32350/uer.32.02

Saleem, A., Muhammad, Y., & Siddiqui, M. (2021). Effectively managing the classroom: a case study of four novice elementary teachers in private schools. *Global Social Sciences Review, VI*(III), 72-79. https://doi.org/10.31703/gssr.2021(vi-iii).08

Sanetti, L. M. H., Kratochwill, T. R., & Long, A. C. J. (2013). Applying adult behavior change theory to support mediator-based intervention implementation. *School Psychology Quarterly, 28*, 47-62.

Sarkar, S. and Kundu, P. (2021). Self-efficacy of teachers in managing inclusive classroom behavior: an analysis. *Asian Journal of Education and Social Studies, 15*(1), 46-53. https://doi.org/10.9734/ajess/2021/v15i130370

Savage, T. V., & Savage, M. K. (2009). *Successful Classroom Management and Discipline: Teaching Self-Control and Responsibility*. (3rd edition). Sage Publications.

Seaborn, K., & Fels, D. I. (2015). Gamification in theory and action: A survey. *International Journal of Human-Computer Studies, 74*, 14-31.

Shank, M. K., & Santiague, L. (2022). Classroom management needs of novice teachers. *Clearing House, 95*(1), 26-34.

Shin, N., Jonassen, D. H., & MaGee, S. (2003). Predictors of well-structured and ill- structured problem-solving in an astronomy simulation. *Journal of Research in Science Teaching, 40*(1), 7-27.

Shireen, S., Mehmood, S., & Habib, M. (2020). Effects of class size on classroom management: a study on elementary schools. *Global Educational Studies Review, V*(III), 207-213. https://doi.org/10.31703/gesr.2020(v-iii).21

Sicart, M. (2008). Defining game mechanics. *Game Studies, 8*(2), 1-14.

Silverman, R., Welty, W., & Lyon, S. (1992). *Case studies for teacher problem-solving*. McGraw-Hill.

Skeriene, S., & Juceviciene, P. (2020). Problem solving through values: A challenge for thinking and capability development. *Think, Skills, Create, 37*, 1-31, doi: 10.1016/j.tsc.2020.100694

Smith, B. (2000). Emerging themes in problems experienced by student teachers: A framework for analysis. *College Student Journal, 34*(4), 633-641.

Smith, S. C., Lewis, T. J., & Stormont, M. (2011). An investigation of the use of two universal behavioral supports for children with externalizing behavior in Head Start classrooms. *Journal of Positive Behavior Interventions, 13*, 133-143.

Solomon, B. G., Klein, S. A., & Politylo, B. C. (2012). The effect of performance feedback on teachers' treatment integrity: A meta-analysis of the single-case literature. *School Psychology Review, 41*, 160-175.

Sudzina, M. (1999). *Case study applications for teacher education: Cases of teaching and learning in the content areas*. Allyn & Bacon.

Suico, C. (2021). Teachers' attributes and self-efficacy as predictors of classroom management. *International Journal of Asian Education, 2*(2), 195-212. https://doi.org/10.46966/ijae.v2i2.176

Tahir, T., Khan, K., & Aurangzeb, W. (2019). Effective use of classroom management techniques in overcrowded classrooms. *Global Social Sciences Review, IV*(I), 137-144. https://doi.org/10.31703/gssr.2019(iv-i).18

Tschannen-Moran & Hoy, (2001). Teacher efficacy: capturing an elusive construct. *Teaching and Teacher Education, 17*(7), 783-805.

Ulvik, M., Kjærgård Eide, H. M., Eide, L., Helleve, I., Jensen, V. S., Ludvigsen, K., Roness, D., & Torjussen, L. P. S. (2022). Teacher educators reflecting on case-based teaching. A-collective self-study. *Professional Development in Education, 48*(4), 657-671.

Unal, Z., & Unal, A., & Bodur, Y. (2016). *Case Studies to Deepen Understanding and Enhance Parental Involvement Skills in Pre-Service Teacher Training Programs*. In Proceedings of Society for Information Technology & Teacher Education International Conference 2016 (pp. 2394-2401). Association for the Advancement of Computing in Education (AACE).

Unal, Z., & Unal, A. (2017). *Investigating and Comparing the Effectiveness of Three Different Case-Based Instruction Strategies in Classroom Management*. The annual American Educational Research Association Conference (AERA 2017) Meeting, San Antonio, TX.

Veenman, S. (1984). Perceived problems of beginning teachers. *Review of Educational Research, 54*(2), 143-178.

Wallace, T., Parr, A., & Correnti, R. (2019). Assessing teachers' classroom management competency: a case study of the classroom assessment scoring system–secondary. *Journal of Psychoeducational Assessment, 38*(4), 475-492. https://doi.org/10.117

Walther, J.H. (2016). Teaching ethical dilemmas in LIS coursework: An adaptation on case methodology usage for pedagogy. *The Bottom Line, 29*(3), 180-190. https://doi.org/10.1108/bl-05-2016-0020.

Yeong, F. M. (2021). Using Asynchronous, Online Discussion Forums to Explore How Life Sciences Students' Approach an Ill-Structured Problem. *Teaching and Learning Inquiry, 9*(1), 138-60. https://doi.org/10.20343/teachlearninqu.9.1.11.

Zottmann, J. M., Goeze, A., Frank, C., Zentner, U., Fischer, F., & Schrader, J. (2012). Fostering the analytical competency of pre-service teachers in a computer-supported case-based learning environment: A matter of perspective? *Interactive Learning Environments, 20*(6), 513-532.

Zourmpakis, A-I., Papadakis, S., & Kalogiannakis, M. (2022). Education of preschool and elementary teachers on the use of adaptive gamification in science education. *International Journal of Technology Enhanced Learning, 14*(1), 1-16.

Author Biographies

Dr. Zafer Unal, a Professor at the University of South Florida's College of Education, teaches undergraduate and graduate courses in standards-based education, classroom management, and technology. A recipient of multiple teaching awards, his research focuses on teacher preparation program assessment, technology integration, and innovative classroom management. He is also a certified Quality Matter course reviewer and serves as a site reviewer for teacher education programs nationally and in Florida.

Dr. Aslihan Unal is a professor at Georgia Southern University, teaching in the Department of Elementary and Special Education since 2013. She leads the "Curriculum and Instruction - Accomplished Teaching" fully online program for K-12 teachers pursuing their master's degrees. Her research interests include assessment, flipped classrooms, parental involvement, artificial intelligence, diversity, case studies, classroom management, and technology in education. Additionally, she serves on departmental, college, and university-level committees.