

USING CREATIVE PROBLEM SOLVING AND MOBILE LEARNING TO DEVELOP CLASSROOM MANAGEMENT SKILLS OF ENGLISH PRE-SERVICE TEACHERS

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ABSTRACT: *The purpose of this study was to investigate the effectiveness of creative problem solving and mobile learning in developing EFL pre-service teachers' classroom management skills. The sample of the study included 10 pre-service teachers enrolled in the fourth year, English department for basic education at Port Said Faculty of Education. A mixed methods research design was adopted for this study to allow triangulation of data and explore the multi-dimensional nature of classroom management skills. The instruments of the study included a classroom management skills questionnaire, classroom management observation checklist, classroom management skills test and a rubric for scoring it and two interview question guides. The results of the study revealed that the treatment was effective in developing EFL pre-service teachers' classroom management skills. Pre-service teachers started with a limited perception of classroom management skills and moved to a much clearer, organized, and complicated one as shown in the participants' responses to interview questions. On the other hand, they stressed the importance of creative problem solving and mobile learning in helping them to solve different classroom management problems.*

KEYWORDS: Creative problem solving, mobile learning, classroom management skills, EFL pre-service teachers.

INTRODUCTION

Classroom management represents a major concern for many teachers, both novice and experienced. The implementation of appropriate classroom management affects teaching and learning. Marzano, Marzano and Pickering (2003, p. 3) point out that using classroom management strategies effectively is one of the challenging functions that quality teachers have to perform in their classrooms to improve students' learning. Classroom management, according to Moore (2008, p. 29), refers to the encapsulation of actions and strategies that teachers use to involve students in learning such as using instructional time efficiently; maintaining orderly environments; controlling student behavior; and forming cohesive learning relationships.

Classroom management can improve many types of growth for students. Ming-Tak and Wai-Shing (2008, p. 4) emphasize that the aim of class management is enhancing

the cognitive, personal, and social growth of students, developing their self-motivation, self-understanding, self-control, self-evaluation, and self-management. Malm and Lofgren (2006, p. 66) add that quality practitioners are organized classroom managers, who have well planned lessons and know their students' strength and weaknesses. These views are supported by Everston and Weinstien (2006) who believe that classroom management requires teachers to meet two criteria; establish and sustain an orderly environment, and enhance the social and moral growth of students. On the other hand, creativity is involved in many aspects of the individual's life. Owoh (2015) indicates that educational systems are designed to raise students who are creative and skillful in solving complex problems. Along the same line, Shieh and Wheijen (2014) suggest that developing students' ability to effectively problem-solve not only helps in developing their capacity for original ideas and actions but also prepares them to successfully cope with life in the twenty-first century.

In addition, creative problem solving (CPS) is considered a process that can be taught and learned. Treffinger, Isaksen, and Stead-Dorval (2006) show that this process works best when it is applied to real-life problems. Students, the authors add, need to learn with authentic depth of understanding, and they need to possess the ability to make real-world application for the world that they will find themselves a part of one day. Concerning the relation between CPS and learning, Gredler (2009) argues that problem solving is the process of taking on new tasks with no established method for finding solutions.

Moreover, the rapid development in the information and telecommunications technologies has affected learning environments. Eyadat and Eyadat (2010, p. 89) claim that the technology-based learning approach appears to be the most effective teaching-learning tool that enhances creativity. M-learning is one of these technologies. Likewise, Livingston (2010) contends that teacher preparation programs have an obligation to explore ways to support preservice teachers' creativity by celebrating their expertise in regards to everyday use of M-learning technology and by increasing teaching and learning opportunities for them to apply this proficiency. Researchers also indicate that increased student achievement, engagement in the learning process, and creativity can be achieved through the use of M-learning (Norris, Hossain, & Soloway, 2011; Rossing, Miller, Cecil, & Stamper, 2012).

One of the advantages of mobile technologies is facilitating coordination among learners. Lundin, Lymer, Holmquist, Brown, and Rost (2010, p. 5) have stressed that mobile technologies allow students to get connected and to manage their work more effectively. Students, as they add, must coordinate themselves towards common goals, negotiate and divide work tasks in cooperation, as well as orient themselves to co-students efforts in the groups work. Distinct features of M-learning are the portability of the devices and the mobility of learners (Traxler, 2007; Yeonjeong, 2011).

The present study came as an attempt to link real classroom problems, CPS stages and M-learning for the purpose of developing classroom management skills of English pre-

service teachers. The advantages that CPS and WhatsApp application have in the field of instruction provided further rationales for conducting the present study.

Context

Classroom management problems are a major concern for new teachers. Most beginning teachers go through a reality shock as they come to realize they are ill-prepared to meet the challenges they face when they first begin teaching (Berry, 2004). In addition, beginning teachers are often given difficult workloads and left to teach primarily on their own through trial and error. Inefficient classroom management skills are a major problem for teacher retention and effective teaching (Oliver & Reschley, 2007).

Criticizing university education, Al-Sharqawy (2005, p. 45) argues that pre-service teachers rarely have an opportunity to apply the skills and theories related to classroom management and effective teaching practices in a simulated real world environment prior to their actual practice in the classroom. Moreover, many novice and student teachers admit that they lack effective classroom management skills and student motivation tactics that endorse learning (Malm & Lofgren, 2006).

In her research recommendations, Al-Gaser (2009) stressed the need for using real classroom management problems as a part of the teacher education program in addition to the constant observation of performance and feedback for the sake of improvement. Similarly, Al-Tartoory and Al-Kudaah (2006) indicate the importance of managerial training of future teachers that is based on thinking and problem-solving. In other words, teacher managerial and educational training is most effective when it is situated in field-like situations and problems.

Unfortunately, studies have shown that pre-service teachers are less than prepared for the classroom management tasks that are a major part of teaching (Farahat, 2011; Hassan, 2008). On their research, Clift and Brady (2005) found that methods courses offer a chance to learn about skills and strategies, but often field experience contradict what is learned, causing pre-service teachers to struggle to put these best practices to work in the classroom.

During methodology courses and field practice with pre-service teachers, the researcher observed a real problem in their ability to manage their teaching practice in classrooms. They were unable to transfer their learning in methodology courses to the classroom setting experiences. When asked about the basic problems they often face in the classroom, many pre-service teachers agreed on problems related to behavior management, motivating students, keeping students' attention, group work and time management.

On these grounds, the researcher was motivated into further investigating the possibility of integrating CPS and M-learning to develop pre-service teachers' classroom

management skills. Prior research showed that classroom management is a variable that positively affects students' learning. So, it was the intention of this research to investigate specific ways in which this variable can be utilized to help the pre-service teachers achieve their true potential as effective classroom practitioners.

Statement of the problem

In the light of the researcher's observations and the results of the aforementioned studies, the problem of the study can be identified in the deficiency of pre-service teachers in classroom management and their inappropriate skill performance. Pre-service teachers often face difficulty in classroom management. They often act awkwardly and inefficiently in class due to time or resource limits or unpredictable situations.

Hence, this study sought to find answers to the following main question:
How far do CPS and M-learning effectively contribute to developing EFL pre-service teachers' classroom management skills?

The following sub-questions were also answered:

- 1- What are the classroom management skills that pre-service teachers need to develop?
- 2- To what extent do pre-service teachers possess these skills?
- 3- What are the features of a treatment based on CPS and M-learning that may develop EFL pre-service teachers' classroom management skills?
- 4- How effective are CPS and M-learning in developing EFL pre-service teachers' classroom management skills?

Hypotheses of the study

Based on the discussion of literature and related studies, the following hypotheses were derived:

- 1- There is a statistically significant difference in classroom management skills between the mean ranks of the participants' scores on the pre- test and those on the post test in favor of the latter.
- 2- There is a statistically significant difference in classroom management skills between the mean ranks of the participants' scores on the pre- observation and those on the post observation in favor of the latter.
- 3- There is a significant correlation between the mean ranks of the participants' scores on the classroom management skills test and their scores on the classroom management observation checklist.

Purpose of the study

The purpose of the study was twofold:

- 1- Investigating EFL pre-service teachers' perception about the aspects of classroom management.

2- Determining the effect of CPS and M-learning on improving EFL pre-service teachers' classroom management skills.

Significance of the study

The significance of the study stems from the following considerations:

- 1- The classroom management skills questionnaire, classroom management observation checklist, classroom management skills test, the two interview questions guides and the proposed treatment might be beneficial to EFL researchers and curriculum designers.
- 2- The study might provide guidelines upon which further treatments are designed to develop classroom management skills.
- 3- EFL pre-service teachers might be able to use the treatment to develop their classroom management skills and it can also provide guidelines for teachers that might endorse optimal student learning as well.

Delimitations of the study

Since it was beyond the limits of a single study to consider a wide range of factors, this study was restricted to:

- 1- Selected classroom management skills that are required for EFL pre-service teachers.
- 2- A sample of ten fourth year English pre-service teachers at Port Said Faculty of Education.
- 3- A limited duration for implementing the treatment (ten weeks).

Definition of terms

Creative problem solving

Isaksen, Dorval, and Treffinger (2011, p. 19) define problem solving as a process of closing the gap between what is and what is desired. It is the act of answering questions, clearing up uncertainties, or explaining something that was not previously understood. The researcher operationally defined creative problem solving, in the context of this study, as a systematic process of using creative thinking to identify or define a problem, generate ideas, and implement the idea or ideas to solve classroom management problem.

Mobile learning

M-learning refers to the acquisition or modification of any knowledge or skill through the use of mobile technology, anywhere, anytime and which results in the modification of behavior (Cavus, & Ibrahim, 2008, p.79).

It is described as participation in learning activities through the use of wireless hand held devices and technologies that enhance student outcomes (Rossing, et al., 2012, p. 3).

In the present study, M-learning refers to using WhatsApp Messenger, an instant messaging application for smart phones, to present, discuss and give feedback to fourth

year pre-service teachers about classroom management problems using text, images, or video messages.

Classroom management skills

Classroom management skills refer to the actions teachers take to create an environment that supports and facilitates both academic and socio-emotional learning (Evertson & Weinstein, 2006, p.4).

Ming-Tak and Wai-Shing (2008, p. 4) define classroom management skills as the sum of teachers' actions which lead to the creation of a learning environment where positive interpersonal interaction is promoted and effective learning is facilitated.

According to Taylor (2009, p. 3), classroom management is the process by which teachers create and maintain environment in the classroom that allows students the best opportunity to learn. It includes setting up and applying structures, tools and techniques to promote appropriate behaviors and classroom interaction that aid learning.

Classroom management skills are also defined as all the skills pertinent to self, student, and environment management in the classroom setting (Whetten & Cameron, 2002, p. 35).

In the present study, classroom management refers to all the skills that English pre-service teachers use to create a positive learning environment that improves academic performance, social interaction and student behavior in their classrooms. These skills include time management, grouping skills, instruction giving skills, behavior management, motivation, rapport, and presentation skills.

REVIEW OF LITERATURE

The following section sheds more light on the main variables of this study which are creative problem solving (CPS), M-learning, and classroom management skills:

Creative problem-solving

Many educational systems place significant emphasis in developing the creative abilities of students. These abilities help students generate ideas and create new ways of using knowledge to solve a variety of problems. Bae, Song, Park, and Kim (2013) point out that creative ability is considered an important component of developing students' cognitive and problem-solving abilities. The CPS process has also evolved over the last several decades. Amabile (1983), a pioneer in the field of creativity research, defines CPS as the generation of a novel, useful, and socially valued outcome, such as a product, service, or idea. Recently, Treffinger, Isaksen, and Stead-Dorval (2006) published a framework that revised the CPS process to include the stages of (a) understanding the challenge, (b) generating ideas, and (c) preparing for action.

Along the same line, Jonassen (2004) suggests that problem solving is a goal directed sequence of cognitive processes which requires (a) having the knowledge and cognitive

abilities to construct the problem into personally understandable terms, (b) having the procedural knowledge of how to perform the needed tests or problem solving activities, and among other things, and (c) having the evaluative knowledge of when and where to perform the needed activities.

There are many models of CPS available. Most can be summarized as a process of identifying the problem, generating ideas for a solution, selecting a solution, and developing a plan of implementation. Some go further and explicitly include processes of combining knowledge at different phases or adding assessment of the plan once implemented (Hunter, Beddell-Avers, Ligon, Hunsicker, & Mumford, 2008; Mumford, Antes, Caughron, Connelly, & Beeler, 2010).

Researchers have found that many different cognitive processes are used when actively engaged in CPS, such as various types of reasoning, ways of organizing information, application of previous and new knowledge, or evaluating ideas (Baer, 2003; Shin, Jonessen, & MaGee, 2003). Others have also pointed out that teachers with CPS skills are more effective problemsolvers. For example, Simplico (2000) showed that teachers who use their creative ability to solve various classroom problems are more effective in their teaching and are less likely to choose to leave the profession. Similarly, Davidovitch and Milgram (2006) found a positive correlation between creative thinking and teacher effectiveness in solving realistic classroom problems.

Studies have also shown that novice creative problem solvers can demonstrate improved ability in CPS when training of CPS techniques was implemented (Dow & Mayer, 2004; Reilly, 2008). Renzulli (2005) proposed that the application of instructional methods used in gifted education, including CPS, could be an important step in the cognitive development of all students. Moreover, in her study, Pannells (2010) revealed that the pre-service teachers who got CPS training had lower scores on elaboration and higher scores on application of CPS strategies.

It is clear that CPS is mainly a structured approach to finding and implementing solutions. It allows students to produce novel and useful responses to open-ended challenges. The problem solvers come up with solutions that are innovative, rather than obtaining help to learn the answers or implementing standard procedures. While the CPS process has been reworked over the last fifty years, the six stages of the process still include mess-finding, data-finding, problem-finding, idea-finding, solution-finding, and acceptance-finding.

Mobile learning

M-learning, as a new opportunity for learners to express their thoughts using Internet facilities, is gaining universal interest among scholars and educators. According to Naismith, Lonsdale, Vavoula, and Sharples (2004), portability and accessibility of mobile devices have attracted many scholars to use them in the educational settings. Moreover, applying portable technologies have been demanded by many learners who

are forced to study anywhere and anytime, for example, at work, in the bus or at weekends (Evans, 2008).

For some researchers (Caudill, 2007; Mostakhdemin-Hosseini & Tuimala, 2005; Quinn, 2000), M-learning can be seen as an extension of the E-learning because it is an E-learning supported with mobile devices. For another author, it is a support of the in-classroom processes (Walsh, 2010). Nevertheless, M-learning is much more than the abovementioned. Chen and Hsu (2008) indicate that the digital content of mobile devices can help learners undertake learning activities at any time and place.

Citing the positive potential increases in both pedagogical creativity and student achievement, researchers advocate for teacher preparation programs to strengthen mobile technology use by the current generation of pre-service teachers (Kant, 2012; Norris, Hossain, & Soloway, 2011; Rossing, et al., 2012). Livingston (2010), Bennett and Maton (2010), and Tillander (2011) also describe ways that pre-service teachers currently display creativity while using M-learning technology to actively participate in accessing information, self-directed learning opportunities, data sharing through collaboration with peers, and content creation.

Two major perspectives concerning the impacts of M-learning technology become apparent in the literature. One perspective is that of increasing student achievement and learning new words (Cavus & Ibrahim, 2008; Huang, Yang, Chiang, & Su, 2016; Norris, Hossain, & Soloway, 2011) and the other is from a stance of enhancing students' engagement in the learning process and collaborative learning (Ilic, 2013; Rossing, et al., 2012).

In his qualitative study, Onion (2014) examined pre-service teachers' perceptions of the ways creativity is displayed within their instructional practices when M-learning technology is utilized. Results revealed that pre-service teachers perceive themselves to be prolific, knowledgeable, and creative users of M-learning technology for improving their instructional practices.

WhatsApp is a popular smartphone application that functions on various devices. WhatsApp application, Cohavi (2013) argues, has been available on the market since 2010 and is developed mainly for the purpose of replacing the existing SMS platform by giving a free of charge service. It provides various functions, for instance text messages, audio files, attached images, link to any websites and video files which can be shared. It could help in developing the student's learning performance. Precisely, WhatsApp is rated as a great societal connection that connects individuals to get and share the humongous worldwide information rapidly (Nicholson, 2011).

In addition to these benefits, Mista and Embir (2016) indicate that WhatsApp has become popular as a M-learning style and is regarded as one of the communication platforms since many students nowadays have their own smartphones. It also increases idea contribution among students and provides faster and easier communication.

Solomon and Schrum (2007), on their part, claim that WhatsApp provides a conversation platform to everyone which allows the existence of a relationship among them. It promotes information and knowledge sharing unconsciously. These views are supported by Patient and Crispen (2011) who calls for using WhatsApp to demonstrate the sharing of academic information.

Another study found out that many universities and higher institutions have recently used WhatsApp via their smartphones in order to develop their communication through forums, discussions and information sharing, for instance, text messaging, mobile social network and web based learning (Echeverria, Nussbaum, Calderon, Bravo, & Infante, 2011). Moreover, many studies concluded the positive impacts of the WhatsApp application in education such as effective information-sharing and ease of communication (Devi & Tevera, 2014), and improved English language skills (Abdul Fattah, 2015; Mar, 2013; Mista & Embir, 2016; Rambe, & Chipunza, 2013; Riyanto, 2013).

To sum up, learners are increasingly motivated by their personal learning needs, including those arising from greater mobility and frequent use of social media applications. WhatsApp is used not only to socialize with friends, but also to study and even learn a variety of skills. The rapid evolution in the field of M-learning can help in proposing activities that can attract students and provide fun- based learning. These activities can also develop a variety of skills including classroom management.

Management Skills

Classroom management is a vital skill needed by teachers as they first enter the classroom. Wong and Wong (1998, pp.1-2) refers to it as all the things teachers do to organize students, space, time, and materials to maximize effective teaching and student learning. They believe that the four characteristics of a well-managed classroom are the following: (a) students are deeply involved in their work, especially the academic ones, (b) students know what is expected from them and are generally successful, (c) there is relatively little wasted time, confusion or disruption, and (d) the environment of the classroom is work-oriented and at the time it is relaxed and pleasant.

Classroom management is also one of the major domains in educational standards. For example, McCloskey (2003, p.8) points out that in STEPS (Standards for Teachers of English at Pre-Service) classroom management is one of five central domains that describe what the newly qualified teachers in the Egyptian Faculties of Education should know and be able to do as shown in the STEPS pyramid diagram below:

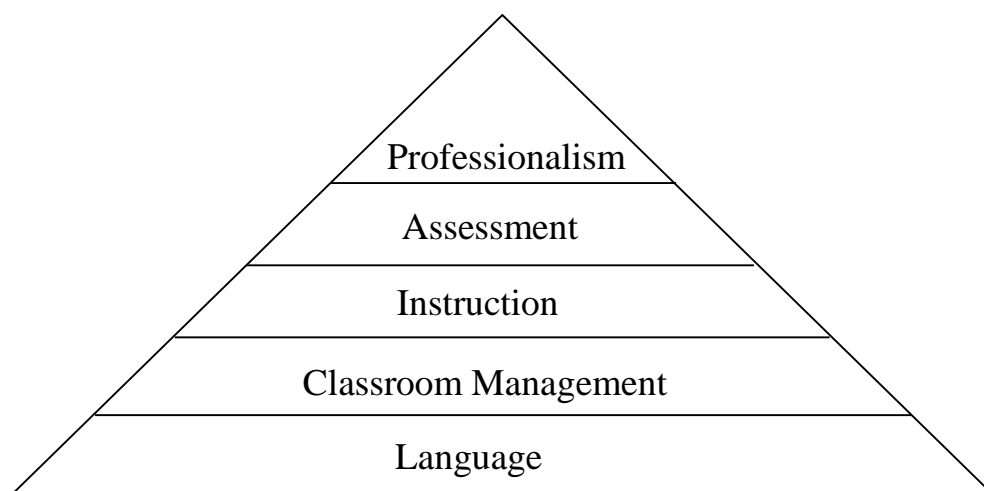


Figure 1: The Five Domains of STEPS Project

Source : McCloskey (2003 , p.8)

Concerning the classifications of class management skills, Ralph (2005, pp. 272-273) divides them into four broad disciplines, each involving its own set of skills and values that practitioners are supposed to use in the classroom. The classification includes the following:

- 1- Personal and professional skills: the practitioners' ability to manage and fulfill professional commitments.
- 2- Instructional/presentation skills: providing clear directions, maintaining conducive instructional environments and employing a variety of instructional approaches to motivate students' learning.
- 3- Responsive managerial skills: they are related to oral questioning, providing positive reinforcement and feedback, and posing clear pedagogically- oriented questions.
- 4- Evaluative managerial skills: using variable assessment instruments that are context-oriented.

On the other hand, Mazzaresse (2005) attempts a classification that pays much attention to the practical aspects of management as the following: 1) Personal skills such as self-awareness, managing stress, solving problems, and creativity; 2) Interpersonal skills which include coaching, counseling, supportive communication, gaining power / influence, motivating self/others, and managing conflict; 3) Group skills that are related to empowering and delegating, building teams, leading change, and monitoring task performance.

Jackson (2000, p.9) suggests another classification that falls into three dimensions: interpersonal managerial skills, personal managerial skills, and cognitive managerial skills table (1). Interpersonal managerial skills, he maintains, focus on relationships with students and self-other interchanges. Personal managerial skills are related to personality traits and self-oriented characteristics. Cognitive managerial skills have to do with management in relation to cognition and mentally oriented managerial behaviors.

Table (1): Jackson's classification of managerial skills

Interpersonal managerial skills	Personal managerial skills	Cognitive managerial skills
Persuasiveness	General leadership	Technical orientation
Negotiation	effectiveness	Analytical orientation
Conflict management	Self-discipline	Decisiveness
Communication skills	Flexibility	Creativity
Open mindedness	Emotional control	Objectivity
Interpersonal relations	Organizational behavior	Risk-taking
Formal presentation	Productivity	Strategic planning
Active listening	Assuming responsibility	
Monitoring		
Motivating others		

Source: Jackson (2000, p.9)

On the other hand, Marzano, Marzano and Pickering (2003) reviewed current studies focusing on classroom management that has been identified as an important part of teaching and cited various meta-analyses from 1993 to 2002 that supported the importance of effective classroom management through findings of higher student achievement scores, lower discipline problems, and less stressful work environment for the teacher to support their claim.

To overcome difficulties in classroom management, Vanci-Osam and Balbay (2004) designed a teacher education program based on social constructivist approach. The findings provided insights about how socio-constructivist learning environments led to conceptual change in student teachers' images on classroom management and their possible future practices. In her study, Farahat (2011) revealed that the cognitive apprenticeship program was effective in developing English pre-service teacher' classroom managerial skills.

As a result of using both conventional theoretical training on classroom management and observation, Al-Gaser (2009) found that the novice EFL female teachers' classroom management competencies developed to a considerable extent and their anxiety decreased. She attributed the decrease in their teaching anxiety to the combination between theoretical training and direct field application which lent a sense of purpose and confidence to the subjects. Similarly, Hassan (2008) showed that using a training

program based on language activities classroom management skills for third year English majors was effective in their acquisition and use of these skills.

It is clear that one of the characteristics of a highly qualified teacher is having good classroom management skills. It is also a major influence on student learning. Strengthening pre-service teachers' classroom management skills, using CPS to solve classroom management problems as well as transferring M-learning technology skills from daily use to creative academic and pedagogical purposes are also required skills.

METHODOLOGY

Design of the study

A mixed methods research design was adopted for this study to allow triangulation of data and explore the multi-dimensional nature of classroom management. Quantitative method was used to collect empirical data and qualitative method was used to gather rich, in depth data. DeWaal (2001) defines mixed methods research as the class of search where the researcher combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study. Tashakkori and Teddlie (1998) add that the major advantage of mixed method research is that it enables the researcher to simultaneously answer confirmatory and exploratory questions, and therefore verify and generate theory in the same study. This design helped the researcher explore in greater detail how CPS and M-learning developed EFL pre-service teachers' classroom management skills in addition to the reasons of such change.

Participants

The participants in this study included 10 EFL pre-service teachers, nine females and one male. They were enrolled in the fourth year, English department for basic education at Port Said Faculty of Education, Port Said University. They aged between 20 and 21 at the time of the study. The treatment was applied in the first term of the academic year 2016-2017.

Instruments of the study

Four instruments were used in this study: (available with the researcher upon request)

- A- Classroom management skills questionnaire
- B- Classroom management observation checklist
- C- Classroom management skills test and a rubric for scoring it
- D- Two interview question guides

Classroom management skills questionnaire

The classroom management skills classification used in this study was adapted from Jackson (2000), Mazzaresse (2005), and Ralph (2005). It covered seven main dimensions; time management, grouping, instruction giving, behavior management, motivation, rapport, and presentation skills. After submitting it for validation, the

number of the sub skills decreased in the light of the jurors' opinions. It was cut down to 34 skills to avoid repetition. In this way, the resulting final version of the questionnaire covered 34 classroom management skills under the seven initial dimensions. It comprised five skills under time management, three under grouping, four under instruction giving, six under behavior management, six under motivation, five under rapport, and five under presentation skills (Appendix: A).

Classroom management observation checklist

Classroom management observation checklist was designed to assess the participants' classroom management skills before and after the treatment. In addition, the aim of this instrument was twofold: (a) It provided a pre-defined set of observable indicators to determine the guidelines against which pre-service teacher performance was measured, and (b) It was used to determine if the pre-service teachers' learned skills were reflected in their actual classroom practice.

The checklist included seven classroom management skills, each skill was measured by a number of indicators on a five Likert-scale. This scale was used to determine how each statement best described classroom management performances. Number 1 indicated that the statement described very poor performance of the inherent class management skill, number 2 indicated poor performance, number 3 indicated average performance, number 4 indicated good performance, and number 5 indicated very good performance of the class management skill (Appendix: B).

Validity

To test the validity of the observation checklist, it was presented to a panel of jury of specialists in faculties of education (N.3). Their opinions concerning categories and domains of analysis were taken into consideration. The test was scored out of (170). Two raters scored the observation checklist and the average score was determined in order to be used in the statistical analysis.

Inter-rater reliability

For ensuring inter-rater reliability, two raters scored the observation checklist in both pre and post testing. Each rater calculated the scores of individual pre-service teachers in the pre and post measurements, then the mean of the scores of both ratings was calculated. Calculating the means of both observation ratings, using Person correlation, it was found out that there was high consistency between the two ratings on both pre and post testing. As shown in table (2), there was a high correlation at the 0.01 level between the first and second ratings of the pre-observation (0.93) and the first and second ratings of the post-observation (0.96).

Table (2): The correlation between the two raters of the pre -post class management observation checklist

N	Person correlation	Sig.
Pre – observation first and second rating	0.93	0.01
Post – observation first and second rating	0.96	0.01

Classroom management skills test

It was designed for assessing fourth year EFL pre-service teachers' classroom management skills during and after exposure to the treatment. The problems were designed to simulate real- life class situations. The participants had to use the CPS steps to handle each situation which represented one classroom management skill (Appendix: C). After being exposed to the first part of the treatment that focused on introducing the theoretical basis of CPS and its stages supported by the WhatsApp group, the mid classroom management skills test was applied. Seven weeks later, at the end of the treatment, pre-service teachers responded to the post classroom management skills test. To calculate the suitable time for the test, the researcher attempted a pilot test application at the end of the academic year 2015/2016. The test was administered to a sample of 20 EFL fourth year pre-service teachers. They were not included in the main treatment. To settle at the average time suitable, the time each pre-service teacher spent was calculated, added and then divided by the number of the whole sample to calculate the mean time, so the time calculated was two hours.

Classroom management skills rubric

A five level rubric (Appendix: D) was developed by the researcher to grade and analyze the participants' responses to the seven problems in the classroom management skills test. In addition, it was used to assess the participants' CPS reports during the treatment. They had to present a CPS report every week. So, each pre-service teacher had to prepare ten reports. Each level in the rubric was given an estimated value. The first level (no response) was assigned (0). The second level (apprentice) was assigned (1). The third level (basic) was assigned (2). The fourth level (learned) was assigned (3). The fifth level (exemplary) was assigned (4). Using the rubric enabled the researcher to get detailed profiles of the participants' responses in the mid-post classroom management skills test using the six steps of CPS.

Validity

The test and its scoring rubric were presented to a panel of jury of specialists in faculties of education (N.3). Based on their suggestions, some items were paraphrased. So, each problem in the test was scored out of (24). The test was scored out of (168). Two raters scored the test and the average score was determined in order to be used in the statistical analysis.

Two Interview Question Guides

To understand the concepts pre-service teachers had concerning classroom management skills, they were asked three open ended questions prior to the treatment during the entry interview. These questions dealt with their definition of classroom management, the characteristic of a good teacher concerning classroom management and whether class management affects students' learning or not. In response, they wrote down their thoughts and discussed them with the researcher. Appendix E provides a summary of the responses of each participant in the entry interview.

As for the exit interview, it was the final phase of the data collection process that was administered at the end of the treatment for qualitative purposes. It was divided into two parts; the first part included the same three questions in the entry interview to realize the change in the participants' responses concerning their perceptions of the different aspects of classroom management. The second part served to shed light on the participants' points of view about issues regarding the use of CPS, WhatsApp, examining authentic problems during the treatment and the effect of their improved classroom management skills upon their teaching performance. It included four questions. The two interview question guides were presented to a panel of jury of specialists in faculties of education (N.3) who suggested using only seven questions on the exit interview. Appendix F shows a verbatim description of the participants' brief comments on the exit interview questions.

Treatment of the study

The Osborn-Parnes Creative Problem Solving model was chosen for this study because it has been proven to be a successfully adaptable model by many researchers. Studies have shown this model to be an effective set of cognitive strategies for improving CPS scores (Dow & Mayer, 2004; Reilly, 2008). In the present study, the treatment was divided into two parts. In the first part, the theoretical basis of CPS and its stages were presented in three introductory sessions. In each session, one stage was discussed as the following: understanding the problem, generating ideas, and plan for action. In addition, pre-service teachers had to use the stages of CPS to solve a specific problem that they faced in their classes. Other students used to ask questions or add suggestions after each presentation.

As for the second part of the treatment, the classroom management skills were presented and authentic classroom problems were discussed. Each pre-service teacher had to select a problem every week and follow the stages of CPS to solve it. Pairs of pre-service teachers presented their CPS reports since the researcher urged pre-service teachers to help each other to solve their problems. In other words, each pre-service teacher selected a specific problem and at the same time helped his/her peer during the different stages of CPS by advising him/her or observing the implementation of class management skills in their field practice.

The whole treatment lasted for ten sessions; three sessions for the first part (the three stages of CPS) and seven sessions for the second part (the seven skills of classroom management). Each session included specific steps: learning objectives, review, warm-up, mini-lesson, tasks, and home assignment. Each session took two hours weekly over a period of ten weeks(Appendix: G).

Since CPS was a completely new topic for them, pre-service teachers needed continuous mentoring during the treatment. In addition, the limited duration of the treatment, ten sessions, made it necessary to find another tool that can help pre-service teachers be in contact with the researcher to discuss different elements in their CPS assignment either as a group or individually. As a result, the researcher created a group in WhatsApp and called it "Fourth Year". The researcher used to send a summary of each session including the mini lesson and the assignments to the WhatsApp group so that the participant can read it and send the assignment to be evaluated.

Pre-service teachers used to send messages on WhatsApp that included their questions to the researcher or chat as a group in a pre- specified time. They were also asked to post videos of parts of their teaching at schools in the group and discuss them to deepen their understanding of CPS process. They had to send their assignments to the researcher on WhatsApp to be evaluated, then they received immediate feedback and modified their assignments.

Results and discussion

The results of the study will be presented in terms of the quantitative and qualitative indicators of development in pre-service teachers' classroom management skills that is indicated by the results of the study instruments. Other findings related to their points of view concerning the different aspects of the treatment will be also examined.

RESULTS

The results of the study will be presented in terms of the study hypotheses as follows:

1- There is a statistically significant difference in classroom management skills between the mean ranks of the subjects' scores on the mid- test and those on the post test in favor of the latter.

The " Wilcoxon Signed Ranks Test" was used to find out the extent to which pre-service teachers' classroom management skills have developed throughout the treatment. The results of the " Wilcoxon Signed Ranks Test " proved to be statistically consistent with the above stated hypothesis as shown in table (3).

Table (3): " Z" value of the mid and post classroom management skills test

Classroom management test	Wilcoxon Signed Ranks Test					Sig.
		N	Mean Rank	Sum of Ranks	Z	
Mid- Post test	Negative Ranks	0	0.0	0.0	2.84	0.004
	Positive Ranks	10	5.5	55.0		
	Ties	0				
	Total	10				

Table (3) revealed that the estimated "Z" value for the classroom management was significant at 0.004 level. This indicates that there is a statistically significant difference between the mean ranks of the pre-service teachers scores in the pre-posttest in favour of the latter. Therefore, there is enough evidence to support hypothesis one.

2- There is a statistically significant difference in classroom management skills between the mean ranks of the participants' scores on the pre- observation and those on the post observation in favor of the latter.

The results of the " Wilcoxon Signed Ranks Test " proved to be statistically consistent with the above stated hypothesis as shown in table (4).

Table (4): " Z" value of the pre and post class management observation checklist

Classroom observation test	Wilcoxon Signed Ranks Test					Sig.
		N	Mean Rank	Sum of Ranks	Z	
Post - Pre	Negative Ranks	0	0.0	0.0	2.81	0.005
	Positive Ranks	10	5.5	55.0		
	Ties	0				
	Total	10				

Table (4) pointed out that the estimated "Z" value for the overall classroom management skills was significant at 0.005 level. This indicates that there is a statistically significant difference between the mean ranks of the pre-service teachers' scores in the pre-post observation in favour of the latter. Therefore, there is enough evidence to support hypothesis two.

3- There is a significant correlation between the mean ranks of the participants' scores on the classroom management skills test and their scores on the classroom management observation checklist.

The " Spearman's rho" was used to find out the type of correlation between the mean ranks of the classroom management skills test and classroom management observation checklist. The results of the "Spearman's rho" proved to be statistically consistent with the above stated hypothesis as shown in table (5).

Table (5): The correlation between results of classroom management observation checklist and classroom management skills test

N	Spearman's rho	Sig.
10	0.78	0.01

Table (5) revealed that the estimated correlation was significant at 0.01 level. The coefficient calculated for the post measurements of the classroom management skills test and classroom management observation checklist was 0.78. This indicates that there is a statistically significant positive correlation between the mean ranks of the preservice teachers' scores in the post classroom management skills test and post classroom management observation checklist. Therefore, there is enough evidence to support hypothesis three.

In order to test the effectiveness of the treatment, Cohen's (1988) effect size was used. The differences between the two measurements, on both the classroom management skills test and the classroom management observation checklist were identified to decide on the effectiveness of the treatment in developing the research group's classroom management skills.

Table (6): Effect size of the treatment on classroom management skills

Two instruments	Z	N	Effect size (r)
Classroom observation checklist	2.81	10	0.63
Classroom management test	2.84	10	0.64

As shown in table (6), Cohen's effect size was calculated for the classroom management observation checklist and it was 0.63, which is in the range of a large effect size since it is more than 0.5. Furthermore, Cohen's effect size was calculated for the classroom management skills test and it was 0.64, which is also in the range of a large effect size.

Other statistical findings

The classroom management skills test and the classroom management observation checklist were applied as quantitative data- collection tools for measuring the impact of the treatment on the participants' classroom management skills. The results revealed

remarkable improvement for the whole research group in classroom management skill after the treatment. To show the varying rates of improvement in the participants' classroom management skills, a comparison of the mean scores for each sub skill is summed up in tables (7) and (8).

Table (7): The results of the mid- post classroom management skills test

Skills	mid	post	Diff.	Max	Ratio improvement
Motivation	10	22	12	24	50.00%
Rapport	14	22	8	24	33.33%
Grouping skills	12	16	4	24	16.67%
Presentation skills	12	23	11	24	45.83%
Instruction giving skills	10	18	8	24	33.33%
Time management	11	20	9	24	37.50%
Behavior management	12	17	5	24	20.83%
Total score	87	147	61	168	36.01%

Table (8): The results of the pre-post classroom management observation checklist

Skills	pre	post	Diff.	Max	Ratio improvement
Motivation	20	27	7	30	23.33%
Rapport	11	16	5	20	25.00%
Grouping skills	6	9	3	15	20.00%
Presentation skills	17	25	8	30	26.67%
Instruction giving skills	12	18	6	20	30.00%
Time management	14	18	4	25	16.00%
Behavior management	12	18	6	30	20.00%
Total score	68	139	71	170	41.53%

As shown in tables (7) and (8), which illustrate the mean score differences on the pre/mid measurement and post measurement of the classroom management skills test and classroom management observation checklist, all scores of the research group on the post-test were higher than theirs on the pre/mid test. This indicates that the research group gained significant improvement in their classroom management skills as they were exposed to the treatment.

Comparing the pre-service teachers' mean increase in the pre/mid and post tests implied the positive effect of the treatment on developing the research group's overall classroom management skills. However, the classroom management skills test showed that they had specifically lower mean increase in two classroom management skills. That is the percentages of improvement in grouping skills and behavior management were 16.67% and 20.83% respectively. As for classroom management observation checklist, the percentages of improvement in time management, grouping skills, and behavior management were 16.00%, 20.00%, and 20.00% respectively.

RESULTS OF THE INTERVIEWS

The researcher used the entry interview questions to elicit pre-service teachers' points of view about issues related to their classroom management before the treatment. The researcher tried to summarize pre-service teachers' opinions to avoid redundancy since there was some similarity in their answers in the first interview. It reflected a little perspective among the participants regarding the main aspects of classroom management and the ways of effectively managing the classroom. Furthermore, most of the participants had a very traditional view of class management that revealed an authoritarian style of class management and a great focus upon discipline and an authoritarian perception of the role of the teacher.

Apparently different patterns of change in pre-service teachers' perception of classroom management skills were realized. Before using CPS and WhatsApp application, pre-service teachers had a traditional view about classroom management. They viewed classroom management as following rules, keeping quiet, respecting the teacher, organizing class, attracting students' attention, and keeping order. They also considered the main attributes of a good teacher as being firm, having the authority in class, punishing any misbehavior, dominating the class. Of course, there are a variety of sources for such an image related to their experiences in practice teaching, methodology courses, general readings and observations while they were students at schools. So, their responses to entry interview questions were influenced by their prior knowledge about classroom management.

In the exit interview, new challenging concepts appeared. These concepts included creating safe and positive environment, setting class rules with pupils, using incentives appropriately, sharing responsibility, using group work and dealing with students' problems and misbehavior appropriately. These concepts were related to topics discussed during the treatment that focused on how to solve class management problems using specific techniques that helped pre-service teachers deal with different class problems. Analyzing their responses also indicated that they appreciated the non-traditional roles of the teacher like being enthusiastic, committed, active, and

supportive. It is clear that they understood the variety of classroom management skills and its importance to qualified teachers.

Concerning the second part of the exit interview, the results demonstrated favorable responses towards the use of the CPS and WhatsApp application. Pre-service teachers perceived CPS as highly useful. They felt that CPS helped them develop their classroom management skills. It provided them with a systematic process to find out new and appropriate ideas to deal with classroom problems.

In addition, results indicated that the majority of the students were highly satisfied with WhatsApp application, not only because it could increase their willingness to use CPS stages but also it gave them positive impacts on their ability to solve classroom management problems. They also appreciated WhatsApp group and the way they get feedback in supportive and non-threatening learning environment that helped them to participate actively in discussing different assignments. Also, they believed that using WhatsApp group for discussion, team work and giving feedback about assignments gave them the chance to deepen their understanding of the aspects of classroom management. But two students pointed out that sometimes they had problems with internet access that is why they were not able to send their assignments on time. They tried to send it from different cell phones and just added their names to the assignments. Pre-service teachers agreed that their improved class management skills had an effect on their pupils' participation and engagement in different activities. They also believed that using authentic problems worthwhile and helped them develop their classroom management skills. These problems motivated them to think about different solutions since they face these problems in their field practice. For more details about pre-service teachers' responses to interview questions, see Appendix G.

DISCUSSION

The results of the study can be interpreted in terms of the context of the treatment which had a significant impact on the participants of the study. More specifically, using CPS stages to solve authentic classroom problems triggered the participants' motivation and willingness to experiment with new problems and challenges. Equally, using WhatsApp technology played a considerable role in helping the participants to think, discuss and get immediate feedback for solving authentic problems that challenged their abilities. Moreover, the participants went further during the treatment in seeking different creative solutions to deal with the problems they were confronted with, which in turn deepened their learning gains, allowed more transfer of skills, and made them open to new challenges.

The results of testing the hypotheses indicated that there were highly significant differences between the pre, mid and post measurements of the seven classroom management skills for both written test and in class observation, in favour of the post measurements. The flexibility of CPS steps and WhatsApp application helped the

participants to express their solutions, ideas and concerns. The use of the participants' videos along the treatment provided them with opportunities not only to engage in authentic problem solving but also to critically reflect on learning experiences and share these experiences with each other.

Concerning the correlation between the class management test and the classroom management observation checklist, the two instruments ratings were closely correlated. The results indicated a high correlation between the two instruments' ratings, which revealed that the participants were generally most proficient in the areas where they had received the most preparation from the treatment. This finding further pointed out that significant transfer was possibly achieved from the treatment to the classroom field practice.

The variance in mean increase of the different class management skills can be explained in terms of the transferable nature of some skills more smoothly than others due to time limitations. Some skills need longer time to be mastered than others. For example, mastery of grouping skills, behavior management and time management requires much practice, flexibility and experience in dealing with students and balancing affordable time with both lesson and students' needs. In addition, skills such as presentation, motivation and rapport, which are basically more teacher –led, were more transferable than most other skills that required closer contact with students.

Moreover, the results of the classroom management test and the observation checklist revealed that grouping skills had a low mean increase in both measurements. This might be due to the large number of pupils in primary stage classes so they were unable to apply these skills with them to a large extent neither in classroom context nor in the written test. For time management, it had an average mean increase in the written test but not in classroom performance. This might be due to the difficulty of managing time when there is no specific routine for activities, students had to create new activities to motivate students each time. On the other hand, behavior management had a low mean increase in the test but not in classroom context. Students were able to use different behavior management strategies such as class rules chart, group behavior charts and incentives successfully in class.

The mastery of class management skills is a developmental process since it involves many aspects. The shift of focus from the entry interview to the exit interview revealed an understanding of the much more important concepts related to classroom management. The main source of change during these ten weeks was the use of CPS and WhatsApp group that helped to expand their perception of the characteristics of a highly qualified teacher and the variety of classroom management skills.

Results of the interviews revealed two important findings. First, pre-service teachers tended to support their ideas by telling stories or situations that they experienced during their practice teaching. This tendency can be interpreted in the light of Carter's theory

(1993). He indicates that a narrative or a story can be used to understand teacher's thinking. A narrative, according to him, is viewed as a central organizing vehicle for teacher's knowledge and action. So, the treatment helped pre-service teachers to acquire specific knowledge related to classroom management and use the stories of their CPS to convince others, their colleagues and the researcher, of their points of view.

The second finding is related to the importance of team work and feedback that WhatsApp group provided. This finding could be considered consistent with Anderson's (1987) theory of skill learning. He maintains that skill learning grows out of problem solving, more efficient procedures grow out of experience in solving problem and receiving feedback on the outcome of these efforts. In CPS, pre-service teachers take action in the classroom, observe its effect on students and refine subsequent actions accordingly. This action-feedback-revision sequence constitutes Anderson's skill leaning process.

There is a consistency between the findings of the present study and those of some previous studies. For example, the findings of this study echo on previous studies related to using WhatsApp technology like Cavus and Ibrahim (2008) and Riyanto (2013). It is also in agreement with previous CPS studies like Davidovitch and Milgram (2006), Pannells (2010) and Simplicio (2000). This study has also provided indication that CPS should be taught; however it needs to be longer than a ten weeks course. There were indications that participants had learned classroom management at the declarative level, and they transferred the knowledge to a different setting in which they were engaged in solving classroom management problems in their practicum.

CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

Conclusions

It is important to mention that the results of the study are limited by the sample size, the characteristics of the participants, the length of the study and the instruments used to collect data. Within these limitations, it can be concluded that CPS and WhatsApp are effective in developing pre-service teachers' classroom management skills. These results support the indicators of success the CAR and WhatsApp studies showed in other contexts (Cavus & Ibrahim, 2008; Davidovitch & Milgram, 2006; Pannells, 2010; Riyanto, 2013; Simplicio, 2000). To sum up, the results of the study can provide the basis for many other treatments based on CPS and M-learning to develop a variety of skills in different learning contexts.

Recommendations

Based on the results of this study and the above mentioned conclusions, the following recommendations seem pertinent:

- 1- Explicitly teaching CPS stages and classroom management principles while providing practice in college courses for pre-service teachers may be beneficial for teachers' early career abilities as creative solvers of classroom management problems.

- 2- There should be a full year practice teaching for pre-service teachers before being certified as school teachers to have more opportunities to transfer their learned skills to the classroom and develop as expert managers.
- 3- Pre-service teachers should be encouraged to use WhatsApp and share their classroom management experiences to develop their sense of being professional teachers.
- 4- There is a need to train pre-service teachers on how to incorporate and use classroom management strategies that increase student learning.
- 5- CPS training should be incorporated into the teacher preparation program so that future teachers can use to solve classroom management problems.

Suggestions for further research

- More research is needed with greater number of pre-service teachers to validate the results of the present study.
- Conducting studies that compare pre-service and in-service teachers concerning the development of their classroom management skills.
- Comparative studies that investigate the relationships between teachers' improved classroom management skills and the academic performance of their students are needed.
- Studies that use different treatments, other than CPS and WhatsApp groups, to develop pre-service teachers' classroom management skills are needed.
- More research is needed to focus on the three areas of lower rate in this study; namely time management, behavior management, and grouping skills to further investigate their potential growth within extended time plans.

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