The Role of Handheld Computing in Facilitating Teacher Resilience through Problem Solving

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Abstract: Becoming an effective teacher that thrives not only survives involves much more than finishing a licensing higher education program. This study explored problem-solving strategies that student teachers used during their internship semester to cope with professional challenges and to develop resilience. The research questions in this study included: What strategies support the development of resilience? How are teachers approaching the professional dilemmas encountered? How can handheld devices facilitate reflective problem-solving? Six student teachers from early childhood education, special education, and science education used mobile computing devices for a variety of professional and personal purposes and reflected upon and documented uses. Data was analyzed using a case study approach. Major themes included risk factors such as low self-confidence, and protective factors such as strong motivation to teach, and critical reflection skills. Mobile technology devices proved to be easy to use and very helpful in the problem solving process.

Introduction

Increasing novice teacher effectiveness and retention especially in problematic teaching districts has been a topic of concern and study for many years. While many studies have focused on the multiple challenges that teachers face in both rural (Zost, 2010) and urban areas (Tait, 2008; Margolis, 2008; Huisman, Singer, & Catapano, 2010; Castro, Kelly, & Shih, 2010), researchers recently have shifted their interest towards the concept of "teacher resilience" by investigating the specific factors that enable certain teachers to remain and be successful in their profession (Gu & Day, 2007, Beltman, Mansfield, & Price, 2011).

While resilience appears to be an essential factor in teacher retention (Yonezawa, Jones, & Singer, 2011), defining it and conceptualizing the mechanisms through which some teachers cope with adversity and become effective, satisfied professionals, is a complex endeavor and therefore there is not an agreed upon definition to date in the literature (Beltman et al., 2011).

While some authors argue that resilience is a mixture of personal and environmental attributes, most agree that it can be shaped at least in part. Bernshausen and Cunningham (Zost, 2010) identified several characteristics of resilient teachers which included: skillful in their teaching area, a feeling of acceptance by the school and the community, the ability to adjust and prevail over challenges, a higher level of determination and a strong desire not to fail, and a positive outlook about themselves, their school, and life in general.

Currently, resilience is perceived by the majority of authors not so much as an innate quality of the individual to "bounce back", but rather as the result of a complex and dynamic process in which a series of factors interact

(Day & Gu, 2007; Howard & Johnson, 2004; Castro et al., 2009). Thus, by responding to difficult situations with a resilient "nature", an individual learns how to shape their own learning and how to improve problem-solving skills. Studies of the intricate interplay between risk and protective factors conclude that resilience can be learned and will ultimately produce teachers who "stay in the profession [and] do not just survive, but thrive as confident and healthy professionals." (Beltman et al., 2011, p. 196)

In their review of the teacher resilience studies since 2000, Beltman et al. (2011) found evidence of two types of factors whose interplay might lead to resilience: risk/challenging factors and protective factors. Individual risk factors include low self-confidence, difficulty asking for help, conflict between personal beliefs and school practices while contextual risk factors might be related to family, school/classroom characteristics, or other professional work contexts.

Protective factors (supports) in teacher retention have been extensively studied, although like the risk factors, they were not always explicitly related to the concept of "resilience". Among the individual protective factors perception of self-efficacy (Tschannen-Moran & Hoy, 2007), capacity to problem solve (Yost 2006), personal strengths and characteristics such as strong motivation to teach (Gu & Day, 2007), and critical reflection (Bobek, 2002; Gu & Day, 2007) are cited as being essential. Some authors stress the importance of students' ongoing reflection for analyzing and solving dilemmas and for getting a better perspective of the teaching and learning context and the role of oneself in it (Kuechle, Holzhauer, Lin, Brulle, & Morrison, 2010).

In the context of the above data, it seems that the process of building teacher resilience is the missing link between the knowledge and skills acquired during the teacher preparation programs and their application in the classroom for becoming effective and fulfilled professionals. Exploring how novice teachers approach and solve the personal and professional dilemmas as they happen by documenting the events and strategies immediately is important for capturing some nuances and even emotional reactions that could be lost in later reports. Mobile technology devices seem to be the tool of choice for such notations.

In teacher education, there is evidence suggesting that student teacher performance and self-efficacy can be improved using technology (Kopcha, & Alger (2011). More recently, ubiquitous handheld computing offers countless potential uses in field investigations (Soloway, Grant, Tinker, Roschelle, Mills, Resnick, et al., 1999; Franklin, Sexton, Lu, & Ma, 2007; Bennett & Cunningham, 2009). Mobile technology has changed not only the way teachers work with information and assessment in schools, but also the way they interact with their environments and situations. Ubiquitous computing has been proven to facilitate increased communication and knowledge access as well as being useful for planning, organizing, and restructuring students' activities (Franklin et al., 2007). While most studies to date have concentrated on how teachers use mobile devices to improve instruction and learning, some authors have seen the potential of using mobile devices to address problems encountered during field experience and internship. Peng, Su, Chou, and Tsai (2009) and Seppälä & Alamäki (2003) focused on the advantages of using mobile devices to facilitate the discussion of teaching issues between the preservice teachers and their university supervisors. Bennett and Cunningham (2009) used handhelds tools to support formative assessment in the elementary classroom to engage students in an active constructivist model of learning while Chen (2011) confirmed the benefits of teachers using the Mobile Assessment Participation System (MAPS) in self and peer- assessments by students in the classroom. However, to date there are no studies explicitly using mobile devices to capture without delay the challenges and processes the preservice teachers encounter during their student teaching period or to investigate how these mobile devices can mitigate challenging factors and increase protective ones.

Method

Research Questions

The study's main purpose was to explore the various professional dilemmas encountered by preservice teachers during their internship semester and to discover how they manage the transaction between the protective and risk factors as described in the teacher resilience literature.

1. What are the main professional dilemmas identified by the student teachers?

2. In what ways can mobile technology mitigate risk factors and increase protective factors for student teachers?
3. How can mobile devices change the way student teachers solve problems or professional dilemmas in the classroom?
4. How can handheld computing support student teachers in developing as reflective practitioners that are resilient?

Participants

A total of 6 undergraduate students in their semester of student teaching were recruited from a public university in the Southeast United States. The preservice teachers were pursuing a teaching license in their internship semester (student teaching) of their plan of study, and enrolled in the following teacher education programs: 3 in Special Education, 1 in Early Childhood Education, and 2 in Science Education. They were enrolled to fulfill their internship in the spring semester 2012 and have not taught as lead teachers before this internship. The participants are all females, of ages between 26 and 42 years of age and included the following races: White (Caucasian)-3, African American-2, and Native American-1.

Procedure

The handheld computing devices used were iPads2 and were distributed to students at no charge for the duration of the semester (16 weeks). None of the study participants owned or had used a portable device before except smartphones. The participants attended a two-hour training session that included the following:

Training in problem solving techniques. The participants were informed about the procedures to follow in documenting and reflecting events and practices, as well as in the use of the handheld mobile devices and their applications. Procedures for getting support in coping with challenging events were also put into place by establishing communication pathways with the university supervisor, mentors, and colleagues.

Establishing the methods, timing, and rules for noting and keeping records of the challenging events and reflections. The participants were asked to record and upload their problems/dilemmas once a week. They were also scheduled to communicate with the university supervisor periodically.

Basic training in using the mobile devices and the applications required for the project. The participants were instructed to use the mobile devices (iPads) for several purposes including the following:

a. Searching for possible solutions to the encountered problems/dilemmas
b. Implementing the chosen solution such as individualizing instruction for a child, organize activities for a group of children, behavior management.
c. Using the various productivity applications to manage scheduling, tasks, and time planning.

Seven major categories of challenging situations were offered to the preservice teachers for organizing their problem solving/dilemmas using the reflective problem-solving strategy and the hand-held devices: (1) the first day of teaching, (2) working as a team with the cooperating teacher, (3) classroom behavior management, (4) sensitivity to the needs of children with difficult home circumstances, (5) observations by the university supervisor, (6) inclusion practices, and (7) breaking through with a difficult student (Kuechle et al., 2010). However, the participants were encouraged to add any other challenging situations to these general categories.

The student teachers were instructed to use an application - "I can do it – Motivation!" (Bonfire Development Advisors, Inc., 2012) - that was already installed on their iPads. This app streamlines the basic problem solving steps and walks users through three easy steps to identify their blocking thoughts and feelings, and to rephrase them to be more actionable. The content of the problem solving notes were then emailed to the researchers.

There were several apps downloaded on the iPads that the participants were instructed to use; they included notes, draw diagrams, and visually organizing thoughts. In addition, the students were free to use the mobile devices as needed for both professional and personal needs.

Because of their mobility, handheld devices were supposed to facilitate note-taking in various contexts while ideas are still fresh and therefore help solve problems and remember facts. Involving preservice teachers in the learning of problem solving steps and resilience building processes using handhelds devices certainly lent to an active, constructivist learning experience.

Data collection

1. Weekly reflections that the student teachers were required to submit as part of their internship seminar.
2. Problem solving notes of professional dilemmas or problem situations occurred in a specific format using the iPad application "I can do it – Motivation!" (Bonfire Development Advisors, Inc., 2012).
3. Exit interviews were semi-structured interviews to gather information about both the most important experiences and personal characteristics that may evidence resilience, as well as use of mobile devices to solve problems. The interview prompts included the following topics: background information about the participants and the internship school, preparation for teaching, sources of support available, problem solving skills, perceived teaching effectiveness, and use of the mobile devices.

Data analysis

The weekly reflections, problem solving process documents submitted by the participants, and the final semi-structured interviews were qualitatively analyzed as a whole through content analysis. Two categories of information were identified:

1. Types of risks/challenges and protective factors documented by the student teachers
2. The role of mobile technology devices in facilitating the problem solving process and in mitigating the risk factors.

Using the structure of risk factors and protective factors described by Beltman et al. (2011), the data was assigned to various categories and subcategories. For example, risk factors could be individual (negative beliefs, low self-confidence) or contextual (related to the particular school or classroom or to professional workload and difficulty). The individual protective factors included personal attributes, self-efficacy, coping skills, teaching skills, professional reflection and self-care while the contextual protective factors addressed professional and personal support. Although the data collected was analyzed rather deductively (i.e., according to Beltman's existing coding system), the subcategories remained flexible and amenable to the additions of new ones if necessary. Two researchers reviewed every document for content analysis with an inter-rater reliability of 86%.

Results

Resilience factors

The main Risk/challenge factors expressed by the participants have been grouped into five main categories. The most frequently expressed challenge was related to classroom management and coping with disruptive students. This category belongs to the contextual risk factors, in this case the context being the classroom. The student teachers did not feel prepared to cope with students who had disruptive or defiant behaviors and wished they had more training. One student teacher writes *"*MD came into the class with the attitude of wanting to work, but when I gave her the assignment she just closed up on me. When asking her to write she would not respond to anything I asked her. I need to get help with this situation. I panicked. What do I do? What did I do wrong?" while another noted "[…] had a student today who was disrupting the class by giggling, making noise, and attempting to coerce his

peers into joining in to his negative behavior. I needed to stop the disruptive behavior so we could move on with the lesson but had no idea how to do that without stopping the other students from learning. I wish I have learned more classroom management skills because you don't really know how much you can do until you are actually in the classroom." Two students mentioned that not being present at the beginning of the semester when the clinical teacher established the classroom rules was a disadvantage in maintaining an orderly environment. The students' problem solving process showed that they searched for suggestions and solutions to behavior problems in common sense and their peer student teachers rather than their clinical teacher, university supervisor or professional literature**.**

The next risk factor often mentioned was the teacher workload, in addition to actual classroom teaching. This category belongs to the contextual risk factors, in this case the context being the professional work. This category was mentioned especially often by the special education students. The student teachers were surprised and felt overwhelmed by the amount of paperwork involved and by the nonteaching activities that the special education teachers in particular were asked to perform: "There is so much more to teaching than the classroom…. I really need to be aware of the home environment of children because so many come from either poverty or special circumstances"; "There is a lot of planning involved in teaching- overwhelming […] especially when you do not know exactly how to do it."; "I watch my clinical teacher work every day on paper work for new and existing students and it is amazing to see how she handles the stress". The reflections showed that this concern was less evident towards the end of the semester, when supposedly they acquired strategies to manage their schedule and workload.

Concern about emotional involvement with their students and work stress (Personal factors – emotional management) was another frequent topic of worry for the interns. The majority were worried about not being able to separate personal from work related involvement. One student teacher said about a student coming from a family who neglected her where she was not groomed and had the same clothes for a whole week "I'm concerned that my heart strings will want to take over when I am a teacher and how do I balance my emotions with all of my students?" One student teacher specifically expressed her wish to be able to control their emotions "Will I be able to control my emotions or will I break down and cry?" The student teachers became quite involved with the school performance of some students and even contacted their families. One student related "I had a student who would come to the class every morning high, you could not smell or anything but his eyes were bloodshot and he wanted to sleep the whole time. He was also a senior. He was like "I don't care" and I continued telling him "you really can do it" and then one day he came to me and said "What can I do to make up all this work?" And finally he started doing his work, his parents were not cooperative. [So you contacted his parents?] Yes, I told them he really needs to do this, but they said oh well, we really hope he graduates from high school, and the clinical teacher said "don't worry about it", he is not going to do it, but he started trying, he would be on time now. He finally started to try harder and his grades went up. I will go to the school to see if he continued improving and graduate." One participant even expressed concern about being so "emotionally drained and stressed" that she might not be able to effectively parent her own child at home. "This week I feel like I am over my head, with school and with my family. I think I can be a great teacher, but what do I do about being a parent for my own child?"

Time management and organization was often mentioned as a significant challenge due to the multitude of tasks the teachers are expected to accomplish. Several of the problems participants needed to solve were fatigue and stress. One student teacher writes "I need to go through this morning sessions because I feel so tired." During the exit interview another student teacher said "I feel like I have walked into a world were multi-tasking is a must**.** I made the discovery that teachers have a lot of things placed on them, some at very short notice. Would have liked to know in advance how a day of work would look like, organization of events, planning."

Finally, relationships with their colleagues was a concern for special education teachers who worried that regular education teachers did not communicate enough with them regarding inclusion of children with special needs and coordinating the learning goals included in the Individual Education Plan. "I am concerned about my role as a Special Education teacher and working with the General Education teachers" said one student teacher referring to a session in which they worked on a child's upcoming meeting with the parents. Relationship with colleagues was also a concern for two of the other student teachers in relation with assessment of students and planning meetings for the whole school.

The main Risk/challenge factors found in the collected data could also be grouped into five general categories. Flexibility was the quality that the student teachers mentioned most often as necessary for coping with

various situations in the classroom. “What would help me be more successful in teaching is trying to be a more ‘go with the flow person’, to be more flexible, make adjustment, sometimes in the middle of a lesson. I used to be more of a planner and stick with the plans but teaching would challenge that.” To have problem solving skills means to find solutions to situations in which the answer is not immediately apparent. It takes the ability to explore various options and to be willing to accept and apply unusual resolutions. As a result, flexibility is part of problem solving as a protective factor in the resilience process.

The second most often mentioned protective factor identified in teachers’ reflections was having a sense of competence, pride, and confidence in their work and their abilities to be effective. Although most student teachers did not feel very confident in their teaching or behavior management, they agreed that an effective teacher needs to know she is competent and leads the children on the learning path. Through the reflections during the internship, the students discovered and commented on their personal and professional growth and the process of building self-confidence and self-efficacy as they became more experienced. As the student reflections progressed later into the semester, they were showing more confidence in their ability to teach and to handle unexpected situations such as behavioral manifestations. The common theme at the beginning was that they felt just like visitors in the classroom, whereas gradually they began to recognize they can have a role and the students listen to and respected them as participants in the educational process. “I have more responsibility in the classroom which is accompanied with more independence” said one student teacher while another remarked “I know the routines and what needs to be done in the mornings, during class, and after school and I am able to get stuff done without anyone asking me to do it”. This process was not easy and during many weeks they often doubted themselves, questioning and arguing back and forth their choice to become a teacher.

Helping students succeed and having high expectations of them was mentioned by four of the six student teachers as being an important ingredient of teacher success. One participant said that having high expectations of your students comes from self-confidence in ones abilities. “I love children, I want to teach them and watch them grow; I have confidence in my ability to plan lessons” said one participant when asked what will make them an effective teacher. Another participant mentioned that in order to survive in this profession you need “to believe that all children can succeed and keep telling them they can do better.”

Intrinsic motivation for teaching in the form of declared commitment to the profession and desire to make a difference in the lives of children was implied by all interns through various remarks during their reflections and interviews. One participant said “I wanted to be a teacher ever since I was in preschool. Both my parents are teachers and I often ask them for ideas. I know that I can do this even though it is not going to be easy all the time.” Another student teacher stated “[…] questioning why teachers are not paid more or more recognized for the work they do! It truly is a profession that is demanding but very rewarding and sometimes pay is not the main reason you do it.”

The last main category of protective factors was related to the availability of mentorship during the first years of teaching years. This was mentioned by three of the six interns who expressed the needed to consult with an experienced teacher in addition to the clinical teacher and the university supervisor. This necessity can be explained by the fact that a mentor would be someone neutral who is not in a position of evaluating their performance, his or her only role being to strictly provide suggestions and feedback. The mentor therefore is perceived as a nonjudgmental person to whom the interns could talk more openly.

Use of mobile technology

During the exit interviews the interns revealed their use of the iPads during the student teaching period. All but one student stated that they used their iPads daily for various purposes. These uses were grouped in the following broad categories: professional use, personal use, and use for problem solving. The problem for which the iPads were used could be related to work (professional) or to personal life but it stand as a separate category because a problem solving process was involved. For this category the solution was not clear from the beginning as was the case with the other uses.

Use of iPads for professional purposes

All students used the iPad to help them in planning their lessons, either by using it to write lesson plans on the go or by looking for applications or videos to use in their teaching. Another universally common use of the iPad was to reward the students by letting them use it for educational purposes. Still other students used the iPads to individualize instruction. For example, one intern would give the iPad to a student who needed help with reading and would let him play reading games while his classmates were involved in higher level reading activities. In the younger grades the iPads were used for playing educational games in small groups - "Animal Words", "Tic-Tac-Toe", "Puzzles", "Crayola LCC"- while in the science classes they were used to investigate various subjects through the science apps. Another professional use was for jotting down notes while in the classroom. *"The iPad is so easy to grab and so easy to access. You jot down things that you would forget otherwise"*. Interns also used the iPads for networking with their colleagues and for sharing or asking for teaching tips.

Use of iPads for personal purposes

The interns admitted that it was easy to use the iPad for keeping a personal calendar, to-do lists, or for playing mindless games to relax after a long day at school. Although it might seem that this use has nothing to do with resilience, one of the personal protective factors that play an important role in building resilience is taking care of oneself (Beltman et al., 2011). Social networking, playing games, surfing the web, are considered important activities for relaxation and mental health and the student teachers were using the available devices to fulfill these needs.

Use of iPads for problem solving

Although there is sufficient evidence in the data collected in this study that the student teachers used the iPad to solve many problems encountered in their internship semester, the participants did not keep a record of their challenges/professional dilemmas in a structured format as suggested initially. They seemed overwhelmed by the workload of the internship and followed the recommended problem solving steps only partially. Despite the fact that the participants were documenting some of the problems encountered, listed several barriers and "blocking thoughts", and provided possible courses of action, the final step of choosing a solution and implementing it was not acknowledged in the data. The writing up of encountered problems was an additional task that was not required by the internship and therefore was perceived as optional. In future studies the problem solving steps should be included in the required reflections in order to be able to have a periodic and documented record of the challenges they face and the solutions they consider in solving them. Some of the problems the mobile devices were used in are described below.

Individualization of instruction was used often by all participants. For example, the iPad was used as "reward for students who finished tasks to use looking at science apps", "downloaded several educational games that D.S. could do", "really helpful to use with the English Language Learners […] had pictures of the words learned in our weekly topic".

Another frequent use of iPads was to cope with emotionally difficult situations. One student was embarrassed to dress up as character in the "Wizard of Oz" story – as all teachers decided - because he thought his authority in the classroom would be diminished and he would feel ridiculous and unable to perform his role as lead teacher. Another study participant described how she as extremely nervous the first day of teaching and used the problem solving steps to identify her emotions and come up with a plan.

Behavior management of difficult children in the classroom was logged as a problem by four out of the six participants. One of the students shared with the other participants ClassDojo (Class Twist, Inc., 2012), an application that is a classroom tool helping teachers improve behavior in their classrooms quickly and easily. It also captures and generates data on behavior that teachers can share with parents and administrators. Although this was a solution found through their professional learning group instead of the traditional problem solving steps, it seemed to work very well in all the classrooms and supported the case of the benefits of using mobile devices for resilience building.

Both science education interns reported looking up answers to student questions (give it to the student who asked). The same students also described instances in which they researched content and strategies for lesson plans. Four out of six students reported that they used the mobile technology devices to make lessons more interesting and capture the attention of difficult children in class (e.g., "[…] app like a Whiteboard and you can record yourself talking and you can draw on the whiteboard at the same time then you can connect it to the projector and present it in class.").

Another way in which the iPads were used for problem solving was to take notes for later write up of puzzling situations or for incorporating certain student behaviors in lesson planning ("Jot down notes for myself, for example when I was outside.")

Finally, the mobile device was used to demonstrate the clinical teachers how technology can be used and hoping they would be willing to use mobile technology more frequently in the classroom ("used the iPad sometimes to teach my clinical teacher about the various uses [role reversal]"). One particular student reported that she would have liked to use her iPad during formative assessment but her clinical teacher was not in favor because she was not used to it and insisted that the student teacher conducts the assessments the "way it was always done."

Discussion

The purpose of this article was to explore whether the kinds of professional dilemmas student teachers encounter in the classroom and the processes used to cope with them can be better understood as well as mitigated through the use of mobile devices. The focus was on the problem solving process as a main contributor to the development of resilient teachers that do not only survive but strive in adverse environments. By providing the student teachers with mobile devices (iPads) a variety of possible strategies to cope with challenges and develop resilience were uncovered. The results indicate that mobile technology devices not only facilitate many tasks and activities in the day of a teacher, but also add countless possibilities to professionally and personally supporting the teacher and to solving problems.

The student teachers identified several problems but three of them seemed pervasive: managing teacher workload in addition to classroom teaching, coping with emotional involvement at the workplace, and time management and organization. Classroom management seem to be a concern for most teachers independent of the region where they teach or the years of experience and this finding should be an indication that teacher education programs might not be doing enough to prepare their graduates for this challenge.

On the other hand, finding that all participants have found difficult to separate their emotional involvement with the children in their classrooms and were concerned about maintaining an emotional balance between the work place involvement and their own family life was unexpected. Although teachers' emotional involvement is mentioned by some authors (Vanoverbeke & Cavanaugh, 2001; Oplatka, 2004), it is evident that there is nothing in the teacher education programs to prepare them for this effect. Since a sense of wellbeing and emotional control seems to be an intrinsic part of the resilience process, the teacher candidates need to be warned about it and provided with adequate strategies to cope with it.

Finally, the time management and organization challenge seemed to be mentioned by all participants while two of them explicitly mentioned that it would have been extremely helpful if, before beginning their internship they would have knowledge about what a typical day of a classroom teacher looks like and what is the sequence of events. During their higher education program teacher candidates have many field experience requirements but they are not asked to spend an entire day in a classroom.

Many of the problems described may not have been as accurately described and the attached emotions correctly identified without the help of mobile technology devices.

Mobile devices proved very effective at mitigating risk factors and increasing protective factors for student teachers in several ways. As anticipated, the mobile devices served both as easily accessible tools to record notes anytime and anywhere as well as instruments capable to deliver the needed solution. As a recording instrument, the

"I can do it – Motivation!" (Bonfire Development Advisors, Inc., 2012) proved to be and adequate, if not ideal, tool to document dilemmas and to guide the teachers through the problem solving steps including acknowledging and identifying their emotional reactions to the situation. However, a more appropriate application is needed for solving professional dilemmas since these need more time to explore and research various options before settling on implementing one of them. The iPads were also used by all participants to write notes and short messages related to classroom events that needed to be remembered such as ideas for future lesson plans or observations about a particular child.

The mobile devices also provided easy solutions to several professional challenges such as individualizing instruction, educational gaming in small groups of children with similar abilities, quick answers to students difficult questions by letting them search the web and then share the result, and task and time management. An unanticipated use of the mobile devices and their applications was for social networking and playing games as relaxation activities although Beltman et al. (2011) have found that self-care is an important characteristic of a resilient teacher.
The results of this study indicated that mobile technology devices can be a powerful tool for both documenting and facilitating resilience building in beginning teachers. Applications for education and personal productivity purposes exist in such a vast number that every teacher can find at least one containing a solution to particular problems. However, the most efficient way to find out about the best applications is to be part of a professional learning community focused on mobile technology in the classroom. It is widely known that teachers are increasingly embracing the mobile devices for instructional purposes and student assessment but it is less known how this technology is transforming their personal and professional life.

Finally, handhelds have proven to be extremely useful for increasing the ease with which the student teachers were able to take notes about events and behaviors that they later reflected on and made decisions about. Teacher reflection has been identified as one of the most powerful ((Bobek, 2002; Gu & Day, 2007; Kuechle et al., 2010) protective factors in building resilience. By using mobile devices the teachers can now take short notes anywhere and anytime about things they want to come back to and reflect on.

Conclusion

Teacher resilience seems to be an operational term that defines teachers who not only survive in a difficult profession and high needs school environments, but teachers who are also effective and enjoy their work. As demands on teachers continue to increase, teacher education programs are faced with the daunting task of preparing their candidates not only with knowledge and skills but also with the ability to successfully cope with the professional challenges of the job. While limited in several ways, the results of this study suggest that mobile devices were successful in providing easy access to documenting challenges and in improving the problem solving strategy and repertoire of solutions for student teachers. In addition, the results indicate that when given the opportunity, student teachers will use technology to take care of their personal needs as well as their professional ones. Such evidence serves to inform teacher education programs about the missing components that should be added to their curriculum in order to increase resilience in their teacher candidates.

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