

The Role of Handheld Computing in Facilitating Resilience Through Problem Solving

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What comes to mind when you think about teacher resilience?



Literature Review on Teacher Resilience


Bernshausen and Cunningham (Zost, 2010)

- Skillful in their teaching area
- Feeling of acceptance by the school and the community
- Ability to adjust and prevail over challenges
- Higher level of determination
- Strong desire not to fail
- Positive outlook about themselves, their school, and life in general

Resilience can be viewed both as a result and a process in which risk and protective factors interact.



Protective Factors in Teacher Retention

- 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)
 - Critical reflection (Bobek, 2002; Gu & Day, 2007)
 - Importance of students' ongoing reflection for analyzing and solving dilemmas (Kuechle, Holzhauser, Lin, Brulle, & Morrison, 2010)
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Mobile Technology as a Tool in Resilience

- Student teacher performance and self-efficacy can be improved using technology (Kopcha, & Alger (2011)
- 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)
- Ubiquitous computing facilitates communication and knowledge access, is useful for planning, organizing, and restructuring students' activities (Franklin et al., 2007)
- Use of mobile devices to address and communicate problems encountered during field experience and internship (Peng, Su, Chou, and Tsai, 2009; Seppälä & Alamäki, 2003; Bennett and Cunningham, 2009; Chen, 2011)

- ▶ We can call resilient, those teachers who “stay in the profession [and] do not just survive, but thrive as confident and healthy professionals” (Beltman, S., Mansfield, C., & Price, A., 2011, p. 196).



Resilience Factors (adapted from Beltman et al. 2011 and Mansfield et al. 2013)

Individual Risks/Challenges

Negative beliefs/low self confidence

Difficulty asking for help

Perceived conflict between personal beliefs and practices used

Contextual Risks/Challenges

Classroom and school
Classroom management/disruptive students

Meeting needs of disadvantaged students

Geographical/social isolation

Relationships with colleagues

Professional work
Heavy workload

Difficult schools, courses or classes

Poor hiring practices; insecurity

Unsupportive/no mentor

Individual Protective Factors

Personal attributes
Moral purpose; Faith; Intrinsic motivation; Tenacity; Positive attitude; Flexibility, problem solving abilities; Emotional stability.

Self-efficacy
Sense of competence, pride, confidence

Coping skills
Proactive problem-solving; high levels of interpersonal skills, strong networks

Teaching skills
High expectations of students; Instructional practice skills; Confidence in teaching abilities

Reflection and growth
Self-insight, self-evaluation, reflection; Commitment to professional growth

Self-care
Takes active responsibility for own well being
Maintains supportive relationships

Contextual Protective Factors

Contextual support
Mentor support

Support of peers and colleagues

Characteristics of the pre-service program

Support of family and friends

Research Questions

- ▶ How can teacher resilience be identified and taught to preservice teachers?
- ▶ How can mobile devices change the way preservice teachers solve problems or professional dilemmas in the classroom?
- ▶ How can handheld computing support preservice teachers in developing as reflective practitioners that are resilient?

Participants Demographics: Pre-Service Teachers (N: 18)

Gender

Female: 15
Male: 3

Race

Caucasian: 13
African American: 3
Native American: 2

Teacher Education Programs

Special Education – 3
Early Childhood Education - 6
Elementary - 5
Science Education - 4

High Needs School?

Yes: 13
No: 5

Urban: 9
Rural: 9

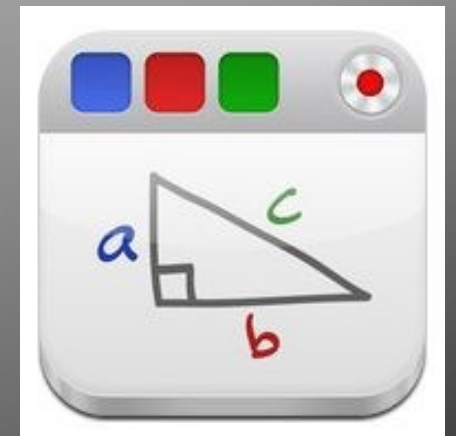
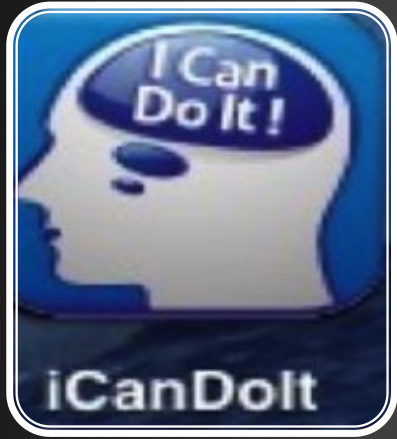
Student Classification

Undergraduate: 14
Graduate: 4
Avg. Age = 25

Procedure

- ▶ Students checked out iPads to be used as a teacher management system during student teaching semester
- ▶ Training of participants:
 - *Problem solving training*
 - *Establishing the methods, timing, and rules*
 - *Basic training in using the mobile devices*
- ▶ Periodic workshops (sharing and receiving answers)
- ▶ Facebook was used as a sharing site
- ▶ Participants recorded at least two problems they solved using the iPad app called iCanDoit

Apps used



Here's what I need to do:

Our babysitter canceled so I should start calling around for a replacement for Saturday. My wife will be very disappointed if we can't go.

I feel:**overwhelmed****90%****resentful****67%****frustrated****0%****angry****90%****isolated****0%****add emotions****My blocking thoughts are:**

My blocking thoughts are:

blocking thought

I don't want to deal with this. I'm too busy.

blocking thought

I could spend half the day on this and get no where or I could end up with a babysitter who I don't feel comfortable with.

blocking thought

If dinner out is so important to her, why doesn't she put in some work to find a decent babysitter?

My personal notes are:

(Optional notes)

My thinking was:

I don't want to deal with this. I'm too busy.

My thought has these distractions:

Reasoning By Emotion



add distraction

My more rational thought is:

I don't want to do this, but I **can** take 10 minutes out of my work day to see if I can find a decent babysitter. If I can't at least I will know I tried.



frustrated

0%




angry

90%



isolated

0%

 add emotions**My blocking thoughts are:** I don't want to deal with this. I'm too busy. I could spend half the day on this and get no where or I could end up with a babysitter who I don't feel comfortable with. If dinner out is so important to her, why doesn't she put in some work to find a decent babysitter? add a blocking thought

My blocking thoughts are:

blocking thought
I don't want to deal with this. I'm too busy.

blocking thought
I could spend half the day on this and get no where or I could end up with a babysitter who I don't feel comfortable with.

blocking thought
If dinner out is so important to her, why doesn't she put in some work to find a decent babysitter?

My personal notes are:

(Optional notes)

My thinking was:

I don't want to

My thought has the



Reasoning



add distr

My more rational t

I don't want to
to see if I can fi
tried.

- A Mental Filter
- All/Nothing Thinking
- Awfulizing
- Blame and Personalizing
- Blind to the Positive
- Exaggeration and Magnification
- Fortune Telling
- Leaping to Conclusions
- Negative Labeling
- Overgeneralizing
- Reading Minds
- Should-ing

iCanDolt Events



Make Action

Edit

Less

Distraction

Save

**My blocking thoughts are:**

blocking thought

I don't want to deal with this. I'm too busy.

blocking thought

I could spend half the day on this and get no where or I could end up with a babysitter who I don't feel comfortable with.

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A Mental Filter

Dwelling on a single negative event to the exclusion of positive events and feelings. Example: A small criticism ruins an otherwise perfect day.

All/Nothing Thinking

Seeing things in black and white (without grays) or viewing a situation as a failure when it is less than perfect.

Awfulizing

Telling yourself you can't stand a situation thereby underestimating your ability to endure it.

Blame and Personalizing

Seeing yourself or someone else as in control of, and therefore responsible for, a complex event, situation or relationship or action of another person.

Blind to the Positive

Dismissing positive experiences by thinking they "don't count" for one reason or another. In other words, nothing is good enough until life is joyless.

Exaggeration and Magnification

Exaggerating your failings and minimize your strengths, qualities or achievements.

Fortune Telling

Anticipating things will turn out poorly no matter what you do.

Leaping to Conclusions

Leaping to a negative conclusion without facts.



Categories of Challenging Situations

1. 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
7. Breaking through with a difficult student

(Adapted from Kuechle et al., 2010)

Data Collection

▶ Quantitative measures (administered pre and post):

- Resilience Survey (Wagnild & Young, 1987)
- Technology Use Survey (Falls & Hagevik, 2012)
- Self Efficacy Survey (Tschannen-Moran & Hoy, 2007)

▶ Qualitative Measures:

- Weekly reflections posted on Blackboard
- Problem solving notes using “I Can Do It” and “Notes” apps
- iPads themselves
- Exit semi-structured interviews:
 - Addressed teaching experiences and personal characteristics for evidence of resilience
 - Use of mobile devices to solve problems

Data Analysis

- ▶ Technology use, self-efficacy, and resilience surveys were analyzed (pre/post) and compared.
- ▶ Qualitative data were analyzed by the three researchers independently and compared. MaxQDA was used to analyze the qualitative data which included weekly reflections while student teaching and audiotaped and transcribed post interviews. We followed a general inductive approach to coding as described by J. Creswell (1998).
- ▶ Quantitative and Qualitative data were analyzed parallel to each other and compared for supporting evidences.
- ▶ Member checking of interview transcripts were not conducted due to participants who had moved into teaching positions.
- ▶ Inter rater reliability was 95% among the three researchers.

Apps preloaded and recommended

for use

I can do it – Motivation!	The app designed expressly for those times you just can't seem to get out of your own way — a minute on iCanDolt can help you prevent hours of lost productivity.
Sticky Notes	Sticky Notes isn't just a note taking and organizing app – it's a versatile tool to create fun and creative notes and reminders. Add alarms to the notes. Use our "task" notes for checklists.
Whiteboard	Educreations turns your iPad into a recordable whiteboard. Creating a great video tutorial is as simple as touching, tapping and talking. Explain a math formula... Create an animated lesson... Add commentary to your photos...
Skype	This app offers instant message, voice or video call on Skype for free.
Google Drive	Upload photos, videos, documents, and other files that are important to you, then access what you need wherever you go, on any device.
Dropbox	This app lets you bring all your photos, docs, and videos anywhere and share them easily. Access any file you save to your Dropbox from all your computers, iPhone, iPad and even the Dropbox website!
Facebook	Used to connect with the social media professional group, share updates, favorite apps, photos and videos, text, chat and have group conversations
Track my Phone	If you misplace your iPhone, iPad, iPod touch, or Mac, the Find My iPhone app will let you use another iOS device to find it and protect your data
Apps for differentiation of instruction or group collaboration	Science apps, reading apps, puzzle apps, social stories apps Social skills and life skills apps.

Apps that the students Downloaded themselves

Apps to manage behavior	ClassDojo – helps teachers improve behavior in their classrooms quickly and easily. It captures and generates data on behavior that teachers can share with parents and administrators.
Classroom organization apps	Seating charts, attendance, questioning
Educational Games for children	Math, Science, Literacy (younger ages), English Language Arts (older students) – Math Games for Kids, Animal Words, Tic-Tac-Toe, Puzzles, Crayola LCC
Organization and time management apps	Calendar, Mind Maps (quickly organize, collaborate, and brainstorm more effectively), shopping list apps
Games for relaxation	Candy Crush, Solitaire, Angry Birds, SpellTower, Words, Blitz

Results:

Technology Use Survey, Self-Efficacy Survey, Resilience Survey

Technology Use Survey (pre/post)			
Name	Pre (%)	Post (%)	Level
Karen	43	49	B
Julie	63	65	I
Cary	72	79	I
Linda	53	56	B
Lindsey	64	69	I
Lala	55	55	I
Lucie	65	78	I
Wendy	65	76	I
Carla	61	73	I
Cindy	68	77	I
April	58	65	I
Sarah	52	59	I
Whitney	64	70	I
Susan	66	72	I
Tara	50	50	I
Joseph	80	86	E
James	45	53	B
Josh	42	45	B
Avg	59	65	4=B, 13=I, 1=E

B=Beginner (less than 50), I=Intermediate (50–80), E=Expert (over 80)

Self – Efficacy Survey (pre/post)			Resilience Survey (pre/post)		
Name	Pre (%)	Post (%)	Name	Pre (%)	Post (%)
Karen	72	81	Karen	62	75
Julie	78	81	Julie	70	81
Cary	71	85	Cary	79	85
Linda	70	80	Linda	74	80
Lindsey	73	89	Lindsey	78	92
Lala	79	85	Lala	89	95
Lucie	70	80	Lucie	75	75
Wendy	72	82	Wendy	72	83
Carla	73	90	Carla	73	90
Cindy	78	88	Cindy	78	88
April	78	88	April	78	89
Sarah	76	88	Sarah	71	71
Whitney	71	71	Whitney	75	88
Susan	69	76	Susan	88	91
Tara	81	89	Tara	69	78
Joseph	75	88	Joseph	81	89
James	70	83	James	88	92
Josh	71	80	Josh	88	89
Avg	74	84	Avg	77	85

Results:

Contextual Risks/Challenges – Classroom and School

Classroom management and coping with disruptive students

- ▶ “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?”
- ▶ “[...] 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.”

Contextual Protective Factors – Classroom and School

Classroom management and coping with disruptive students

Mobile apps for behavior monitoring - ClassDojo (Class Twist, Inc., 2012) workshop

Results:

Contextual Risks/Challenges – Professional Work

Teacher Workload

- ▶ “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.”

Contextual Protective Factors – Professional Work

Teacher Workload

“I have more responsibility in the classroom which is accompanied with more independence.”

Mobile apps for time scheduling and relaxation

Results:

Contextual Risks/Challenges – Classroom and School

Meeting needs of disadvantaged students

- ▶ “I had a student who would come to the class every morning high, [...] his eyes were 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, [...] the clinical teacher said ‘don’t worry about it, he is not going to do it’, but he started trying, [...] and his grades went up. I will go to the school to see if he continued improving and graduate.”
- ▶ Two participants even expressed concern about being so “emotionally drained and stressed” that they 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?”

Contextual Protective Factors – Classroom and School

Individual Protective Factors – Teaching Skills, Self-care

Meeting needs of disadvantaged students

“...to believe that all children can succeed and keep telling them they can do better.”

Mobile apps for time scheduling, stress release and for differentiating instruction

Results:

Individual Risks/Challenges – Self-confidence, lack of problem solving and time management

Time management and organization

- ▶ “I need to go through this morning sessions because I feel so tired.”
- ▶ “I feel like I have walked into a world where 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.”

Individual Protective Factors – Self-confidence, Self-care, problem solving and time management skills

Time management and organization

Mobile productivity apps for time scheduling, organization, and management

“The iPad is so easy to grab and access. You jot down things that you would forget otherwise.”

Results:

Contextual Risks/Challenges – Classroom and school Relationships with their colleagues

- ▶ “I am concerned about my role as a Special Education teacher and working with the General Education teachers.”

Individual Protective Factors – Self efficacy, flexibility, motivation for teaching, availability of mentorship, problems solving and interpersonal skills

Relationships with their colleagues

“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.”

Email, Facebook, access to Internet – Professional Learning Communities, mentoring, finding resources

Conclusions

- ▶ Teacher resilience proved to be an operational term.
- ▶ “Resilience” is an important contributor to teacher success and should be included in teacher education preparation programs.
- ▶ Mobile technology devices can enhance protective factors and support teacher resilience.
- ▶ Problem solving is a teachable ability and should be systematically taught in teacher education programs.
- ▶ Using technology for personal use translates to more and increased use of technology in the classroom (Peng, Su, Chou, & Tsai, 2009; Seppälä & Alamäki, 2003).

Assumptions

We believe that examining the multi-dimensional and dynamic nature of teaching in a range of school contexts informs how to better prepare teachers to deal with the realities of teaching in a range of diverse and adverse conditions. It acknowledges and advocates for the awareness and incorporation of emotional engagement in the mentoring of beginning teachers as well as in teaching. Adopting a multidimensional approach such as described in this study and exploring how mobile technologies are used as a support system in teaching holds the potential to inform teacher education programs and in teacher professional development.



The New

LANDSCAPE

of

MOBILE LEARNING

Charles Miller Aaron Doering

Foreword by Michael Searson

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Questions



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