

Transition From Theory To Practice: A Comparison Of Math and Computer Education And Instructional Technology Teachers During School Experience

Teoriden Uygulamaya Geçiş: Okul Deneyimi Sürecindeki Matematik İle Bilgisayar ve Öğretim Teknolojileri Öğretmen Adaylarının Karşılaştırılması

Rezan YILMAZ

Ondokuz Mayıs Üniversitesi, Eğitim Fakültesi, OFMAE Bölümü, Samsun

Emine ŞENDURUR, Polat ŞENDURUR

Ondokuz Mayıs Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü, Samsun

Makalenin Geliş Tarihi: 25.11.2015

Yayına Kabul Tarihi: 16.12.2015

Abstract

This study aims to understand the experiences faced during school experience period of either prospective Math or Computer Education and Instructional Technology (CEIT) teachers. Highlighting the differences and similarities between prospective Math and CEIT teachers is also one of the purposes. Data were collected from 11 participants. The findings suggested that selection of mentors and practice schools have great importance as well as the true guidance of the university supervisor. Most of the participants agreed on the inadequacies of the connection between what is taught in campus and what happens in schools. In general, both groups of prospective teachers showed similar approaches, but prospective CEIT teachers were more concerned about technological infrastructural problems.

Keywords: School experience, prospective teaches, theory-practice gap

Özet

Bu çalışma, Matematik ile Bilgisayar ve Öğretim Teknolojileri (BT) öğretmen adaylarının okul deneyimi sürecindeki tecrübelerini incelemek amacıyla yapılmıştır. Çalışmanın odaklarından birisi, Matematik ve BT öğretmen adayları arasındaki benzerlikler ve farklılıkları ortaya koymaktır. Veriler 11 katılımcıdan elde edilmiştir. Sonuçlar, mentor ve uygulama okulu seçimlerinin, üniversitelerdeki danışmanların rehberliği kadar önemli olduğunu ortaya koymaktadır. Katılımcıların çoğu, üniversitedeki öğretilenlerle okullarda uygulananlar arasındaki ilişkilendirmenin yetersiz olduğunu düşünmektedir. Genel olarak, her iki bölümün öğretmen adaylarının benzer düşünceler sergilediği ancak BT öğretmen adaylarının daha çok okullardaki teknik altyapının yetersizliği ile ilgili endişelere sahip olduğu görülmüştür.

Anahtar Kelimeler: Okul deneyimi, öğretmen adayı, teori-uygulama boşluğu

1. Introduction

Teacher education has been an extensive research area for those who want to explore how teachers develop expertise. This is still a great question for especially teacher educators and researchers (Hammerness, Darling-Hammond, & Bransford, 2005). Teacher education institutions are generally expected to train students fully equipped with both pedagogical and content knowledge. A didactic curriculum of course work and practical field experiences allow preservice teachers to identify linkages between theory and practice (Retallick & Miller, 2010). In addition, as Shulman (1986) suggested, these institutions should give importance to pedagogical content knowledge with an emphasis on pedagogically strengthened content knowledge transformation. However, it can cause teachers to be educated within an isolated environment with too much theory but less practice. In addition to necessary knowledge and skills, teachers also need to practice in different situations such as various socio-economical level, culture, and language (Coşkun & Daloğlu, 2010; Darling-Hammond, 2006). That is why; transition from theory to practice is crucial as well as being sophisticated.

In a traditional ‘application of theory’ model, students engage in theoretical knowledge and skills in universities, and then they are sent to schools to translate what they learned into practice in real settings (public/private schools) (Korthagen & Kessels, 1999). But this process requires addressing some special and perennial challenges in learning to teach (Darling-Hammond, 2006), such as the ‘apprenticeship of observation’ (Lortie, 1975), ‘the problem of enactment’ (Kennedy, 1999) and ‘the problem of complexity’ (Jackson, 1974). Despite being widely accepted as a tough problem in teacher education, there are still dominant patterns of ‘application of theory’ model in teacher education programs (Korthagen & Kessels, 1999). Such programs that are supposed to train qualified teachers may include a series of different methods including case developments based on real data (Darling-Hammond, 2006), rather than simply observing the mentor teacher, so they have a crucial place both to prepare teachers for real professions and to keep them motivated. The inclusion of rich authentic practices in programs may not only contribute to the self-efficacy of teachers but also affect students’ achievement (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009).

In general, Turkish teacher education programs include a number of pedagogical courses such as classroom management. Although most of them are not directly practice courses, they include some opportunities for field experience. From this perspective, it might be possible to arrange classes with the inclusion of practice. School experiences and teaching practices are directly given for prospective teachers to gain field experiences. First one is a fall semester course and designed to observe real classrooms, students, and teachers. On the other hand, prospective teachers have to practice their teaching skills during teaching practice course which is offered in the spring semester.

Teacher education programs have influences on many aspects of teaching and learning. While authentic early field experiences serve as enablers for better transition from theory to practice, there are many facets serving as barriers. The majority of studies examined teaching practice course period that is given after school experience course. Unlike others, this study explores students first school experiences period that is before teaching practice. It was expected to have an insight of pre-service teachers’ expecta-

tions, experiences, and their influences. Since there are participants from two different departments, this study also focused on the differences and similarities between them, which is not very likely in the current literature.

2. Methodology

Research Design and Participants

This is a qualitative case study conducted with 11 prospective teachers (7 prospective Math teachers-4 females & 3 males- and 4 prospective CEIT teachers-1 female & 3 males-) at a public university in Turkey. The focus of this case is the comparison of those two departments in terms of their school experiences. All participants were successfully completed must and elective field courses; therefore they were headed to field experiences. Prospective Math teachers conducted their observations at a high school that selects students through exams. Prospective CEIT teachers observed an elementary school. There was one mentor teacher per school, and two supervisors from two departments.

Instruments

Prospective teachers were assigned to observe regular classes at public schools at least 3 hours per week. In total, they experienced 42 hours of school experience. They were guided about what to be observed weekly. They were also supposed to write weekly reflections about specific topics including ‘a day of a teacher, preparing a lesson plan, classroom management, teaching approaches, measurement and evaluation, instructional materials and resources, and physical conditions of classroom’.

Researchers conducted semi-structured interviews with prospective teachers in order to evaluate and discuss about the weekly reflection reports. Each participant involved in one interview scheduled at the end of the semester. The main aim of these interviews was to have insight about students’ expectations and gained experiences, rather than summarizing the semester. Moreover, researchers also wanted to understand how those differ across two departments. In short, the guiding questions, which lead us to dig for more insights of participants, were as follows:

- What were your expectations and thoughts before school experience course?
- Can you explain what experiences you gained during your school experience?
- How did the school experience period affect you?

Data collection and analysis

Data were collected during Fall semester. Supervisors and students met and discussed about the activities in the first week, then school administration and mentors provide a short orientation. Experienced mentor teachers were chosen to guide students during the whole semester. Mentors and prospective teachers decided on the weekly schedules to attend classes.

In the end of the semester, researchers conducted semi-structured interviews to have insights of prospective teachers. After transcribing the records, data were analyzed qu-

alatively. Data of each department were analyzed separately. Main categories were *expectations*, *experiences*, and *influences*. Subcategories for each main category were decided. Then, themes for each department and themes revealing similarities and differences between departments were constructed as a result of constant comparisons (Creswell, 1998; Patton, 1990). Two experts reinvestigated categories, subcategories, and common themes separately in order to increase reliability, and then consensus was provided on both categories and themes (Lincoln & Guba, 1985; Yıldırım & Şimşek, 2005).

3. Findings and Discussion

Prospective teachers' expectations from school experience; their gained experiences during observations and impacts of experiences in real schools were explored through conducted interviews. The findings were also evaluated considering department differences (mathematics education: M, computer education and instructional technology: C). Table 1 summarizes prospective teachers' responses (with their frequencies) regarding the evaluation of their school experience.

Table 1. Summary of Categories and Subcategories of Responses

Categories & sub-categories	Frequency of responses
Expectations from school experience	
<i>Excited</i>	6M & 2C
<i>How different methods and techniques are practiced in schools</i>	6M & 2C
<i>How teachers communicate with students</i>	3M
<i>Anxiety about being unfamiliar with students and the mentor</i>	1C
Gained experiences during school experience	
<i>Criticized approaches that were practiced in the classroom</i>	7M & 3C
<i>Emphasized the importance of interaction with students</i>	4M & 4C
<i>Classroom management</i>	2M & 3C
<i>Interpreted the difference between teaching and knowing</i>	3M & 2C
<i>Focused on the importance of asking questions</i>	1M
The influence of school experience	
<i>Theoretical undergraduate education is applicable in real life need</i>	5M & 3C
<i>Challenge of application of different approaches</i>	4M & 3C
<i>Deficiencies of traditional education</i>	4M & 3C
<i>The importance of in-class interaction</i>	3M
<i>The influence of central exam systems on lesson flow</i>	1M & 1C
<i>Excessive content of the curriculum</i>	1M
<i>Infrastructural barriers</i>	3C

Expectations from school experience

Although prospective teachers observed the classes with the guidance of a scheduled plan, they focused and were interested in certain topics. The majority of prospective teachers explained how much they were excited before school experience. They expected to observe modern and different instructional methods and techniques. Some of the

participants mentioned about their willing to observe communication between teacher and students as well as gaining experience. Only one participant (C) told his anxiety about either students or mentor due to not knowing to each other.

Participants related their excitement with three issues: ‘feeling like a real teacher’, ‘wondering about their feelings when they are in real school settings’, and ‘waiting that moment for a long time’. The following excerpts can exemplify the issues:

‘We went to school with a feeling like a teacher.’ (C3rd)

‘We have learned everything in theory. That is why, I wonder about being at real classroom. I mean what I feel...’ (M3rd)

‘We have been students till now. From now on, we become teachers gradually. This feeling is quite different.’ (M2nd)

Being excited before the observations, waiting for it for a long time, and feeling like a real teacher might refer that prospective teachers have great expectations from school observations besides attaching too much importance to that period. Such high expectations and strong feelings can result in either positive or negative effects on their experiences in schools since feelings can play important roles in improvement of either self-regulation or academic performance (Pekrun, Goetz, Titz, & Perry, 2002). Moreover, interest is another important element about motivation (Hidi, 2006). That is why; it might be necessary to put importance on students’ interests and feelings towards school experience.

In addition to excitement, one of the prospective CEIT teachers explained how anxious he was due to being in a situation that he had never been before:

‘An uncontrollable fear, actually not fear, I mean a kind of anxiety. Students are kids that we do not know...an unknown teacher...’ (C2nd)

Such feelings as anxiety are tended to increase linearly in time and thus can affect post experiences (Meece, Wigfield, & Eccles, 1990). In order to prevent students from experiencing high levels of anxiety during school experience, necessary guidance or help should be provided in the beginning (Everhart & Turner, 1996).

In terms of how different methods and techniques are practiced in schools, participants were expecting to experience ‘their theoretical education knowledge within classroom practice’, ‘the most frequently used methods and techniques’, and ‘the effects of applied methods and techniques’. The followings are some examples of this issue:

‘Indeed, attending a real classroom will provide a good opportunity to observe different applications of teaching methods...’ (M1st)

‘We have seen many things in theory like brain-based learning, six hats, ... My expectation is to see which ones are used most frequently.’ (C4th)

‘I am going to see different instructional methods in the school. It would make sense observing their effects on learning.’ (M6th)

Majority of prospective teachers’ expectations included either gaining expertise on

instructional methods and strategies or observing how these were practiced in real settings. It could be interpreted that the quality of observation context is very crucial because students seek for the practice of what they learned theoretically by real teachers. For the school experience courses, the selection of the observation school (McIntyre, Byrd, & Foxx, 1996) and mentor teachers (Vertuno, 1995) has crucial importance. The selected schools should provide rich observation context to prospective teachers through exemplifying various teaching approaches (Carter & Anders, 1996).

Three prospective Math teachers described their thoughts about how teachers communicate with students as ‘understanding students and their thoughts at class’ and ‘observing teacher’s attitudes and behaviors’. The followings is an example:

‘How can I ensure communication with students, for example I would like to see how can I understand or get to know them...’ (M2nd)

Some of the prospective Math teachers valued the communication between teacher and students since they specifically emphasized on the expected observations on that issue. Effective communication is a must for instructional setting (James, Virginia, & Vicki, 2006), and thus the design of instructional messages is important (Simpson & Erickson, 1983). Participants associated student-teacher communication with teacher’s insight of learning and attitudes, which might indicate that these prospective Math teachers give importance to the link between students’ communication aspects and instructional outcomes (James, Virginia, & Vicki, 2006).

Gained experiences during school experience

Prospective teachers conducted observations on teachers and students, then wrote about their experiences, and then reflect on these experiences with details during interviews. Majority of participants criticized approaches that were practiced in the classroom, emphasized the importance of interaction with students and classroom management, interpreted the difference between teaching and knowing, and focused on the importance of asking questions.

It is obvious that participants tended to observe in accordance with their initial expectations before school experience. Beliefs and values can affect the way an individual behaves (Herbel-Eisenmann, Hoffmann, & Seah, 2003). On the other hand, it is hard to observe those directly. In our case, the excerpts provided clues supporting that prospective teachers’ observations are affected by their expectations.

Participants criticizing the approaches practiced in the classroom observed traditional approaches in general. They related this view with these issues: ‘lack of different materials and visuals’, ‘failing to create necessary connections with daily life’, ‘use of presentation method within teacher-centered settings instead of using different methods and techniques’.

Those, who thought ‘lack of different materials and visuals’, also mentioned about their observations related to the use of interactive boards. According to them, such technology integration did not seem to meet the expectations. In other words, these did not lead to active and appropriate environments as predicted.

‘Math is quite abstract. That is why, the use of materials and visuals, like interactive board, is very crucial for students’ better comprehensions, but teachers usually do not do that...’ (M3rd)

Prospective teachers are offered a must course called ‘Material Design and Instructional Technologies’, through which they are assigned to design and develop materials specific to their subject areas. While doing that, they are also expected to integrate instructional technologies in an effective and efficient way. In Turkey, a number of schools have been equipped with interactive boards and tablet PCs recently with respect to Project FATİH. The use of interactive and visually rich materials can enrich students’ active participation. However, prospective Math teachers clearly emphasized the inadequate or ineffective use of these technologies because of the lack of necessary background knowledge (Pamuk, Çakır, Ergun, Yılmaz, & Ayas, 2013). Some of the mentors even never used them, which stroke the prospective teachers’ attention.

Participants focusing on the issue of ‘failing to create necessary connections with daily life’ from both departments stated these comments:

‘Topics were introduced but it is not emphasized if they can be used in daily life or what they correspond in real life...’ (M1st)

‘I think no connection is constructed between the lesson and the real life. I mean, there is a common perception that what is learnt here can only enable you to pass the exam.’ (C1st)

Math educators highlight the importance of linking instruction to real life (Gainsburg, 2008) because it brings about better understanding of math concepts, increase in motivation, and practice opportunities on real math problems (De Lange, 1996; Steen & Forman, 1995). Participants from either department mentioned about the deficiencies in terms of connections with real life. Like in Math subjects, computer subjects can also require linkages to real-life uses because such kind of topics do not only have technical dimension but also social one (Friedman & Khan, 1994).

Prospective teachers emphasized that there is a common ‘use of presentation method within teacher-centered settings instead of using different methods and techniques’. These participants clarified the issue as follows:

‘The teacher just gave the definitions without criticizing or discussing about them. She gave the lecture, solve problems, and finished the lesson...’ (M5th)

‘There could be different examples that are more motivating. Instead of that, examples from books or curriculum were given, i.e. ordinary and straight lessons...’ (C1st)

Participants from both departments referred their observations about traditional methods, which are the opposite of what they wanted to see. Teacher training programs provide much theoretical and practical information, and prospective teachers are expected to first observe them in real settings and then apply through teaching practice. In our case, schools and mentor teachers did not seem to satisfy the needs of observers.

Mentoring is a complex process aiming to adapt teacher candidates to certain settings (Leshem, 2012). Mentors should be aware of the needs of teacher candidates besides being selected within interested ones (Frykholm, 1999; Iancu-Haddad & Oplatka, 2009). Participants observed one mentor during a semester, however, observing more than one teacher applying different methods could allow prospective teachers to compare and evaluate them (Zeichner, 1996). In short, critiques of prospective teachers uncover the weaknesses of mentors of whom the selection is very important as indicated in the literature.

Prospective teacher striking attention to the importance of interaction with students also emphasized the need of ‘gaining attention of students’ and ‘ensuring the motivation’. Unlike prospective Math teachers, all of the prospective CEIT teachers specifically focused on how hard to keep students’ attention high in a laboratory environment.

‘When students in the lab, they tend to interact with computers, come on teacher let us turn on the computer, isn’t it finished yet? Let us play, let us surf on the Internet. It affects the quality of education as a result...’ (C2nd)

‘Teacher should not only know what and how to teach something but also be able to strike attention of students and motivate them at the same time...’ (M6th)

Prospective teachers concluded that interaction with students could serve as a tool for motivation. In the literature, the value of motivation is obvious. In other words, it is a critical factor with respect to lifelong learning (Richmond, 1990), conceptual change (Lee & Brophy, 1996; Pintrich, Marx, & Boyle, 1993), and critical thinking and learning strategies (Garcia & Pintrich, 1992; Kuyper, Werf, & Lubbers, 2000). Nevertheless, from participants’ evaluations, it can be inferred that the interactions did not happen parallel to expectations, which might be explained with the qualifications of mentor and their attitudes towards student-teacher relations.

Participants reflected on their thoughts on classroom management. They related this with ‘the influence of students on teachers’ and ‘the influence of teachers on students’. Moreover, one of the prospective Math teachers referred to ‘efficient use of time’ and one of the prospective CEIT teachers associated the issue with ‘the changes in perceptions and attitudes’.

‘The class environment may have an influence on you. Either in a positive or negative way...The combination of classroom management and instruction is very challenging. It requires expertise...’ (M1st)

‘In general, classroom management is provided with the authority. Students cannot make noise too much. It is the teacher who increases the voice. At that time, students have to listen.’ (C4th)

Prospective CEIT teachers emphasized on classroom management issues more than others. They view student profiles and context as the source of the problems. Classroom management consists of a wide range of skills including the control of misbehavior

(Cothran, Kulinna, & Garrahy, 2003). Misbehavior in classroom can cause distractions and stress for either students or teachers (McCormack, 1997). That is why, prospective teachers should be prepared to understand and manage the process. In teacher education programs, the gap should be closed with the revision of effective communication and classroom management theories and practices (Cothran, Kulinna, & Garrahy, 2003).

Participants who criticized the differences between knowing and teaching explained that ‘having content knowledge is not enough by oneself’ and ‘being aware of different approaches is needed’.

‘I realized that knowing the content very well before teaching is necessary. I need to choose appropriate method and transfer the content in a meaningful way.’ (M5th)

‘In theory we have learnt too many things at school but using them is very different...’ (C1st)

Prospective teachers emphasized the importance of using content and pedagogical knowledge together. They explained how difficult to practice theoretical content and pedagogical knowledge because it requires pedagogical content knowledge to synthesize pedagogical knowledge with subject matter knowledge (Cochran, 1993; Shulman, 1986). Therefore, teacher education institutions should train students to increase the awareness of pedagogical nature of content and to practice them in instructional cases (Segall, 2004).

One of the prospective Math teachers also pointed the importance of asking questions and mentioned about the requirement of ‘appropriate level and content to measure knowledge’.

‘I have realized that asking questions is very important. However, teachers prefer questions that are parallel to university entrance exams. This might not always be appropriate to the class level. In addition to that, using the ready questions might not always be satisfactory to measure because students memorize question types thereafter...’ (M6th)

Asking and answering questions can be considered as some main components with respect to learning, cognition, and education theories (Graesser & Person, 1994). Asking appropriate questions is needed to understand students’ understanding and learning. In order to reveal how deep student thinking is, the questions should be in line with appropriate cognitive levels (Moyer & Milewicz, 2002). Due to being so important, teacher candidates should be trained to ask effective and appropriate questions.

The influence of school experience

In this study, we also tried to explore the influence of school experience process and students’ expectations from teaching practice course. As seen from Table 1, most of the participants expressed positive thoughts in general with realizing that theoretical undergraduate education is applicable in real life, need and challenge of application of different approaches, deficiencies of traditional education and the importance of in-class interaction. Some prospective teachers put their negative thoughts in words as excessive

content of the curriculum, the influence of central exam systems on lesson flow, and infrastructural barriers.

Participants thinking that theoretical undergraduate education is applicable in real life clarified their thoughts as follows:

‘We have seen many education courses. I think those contributed to me very much. In fact, I think in school experience everything is not very close to the ones that were taught us.’ (C4th)

‘Here, my purpose was to observe how the theories that we learned were activated in real life. Education in my high school years was very traditional due to the program itself, but I want to be a constructivist teacher in the future. School experience process gave me the impression to integrate the theories into real life.’ (M2nd)

Prospective teachers mentioning about the need and challenge of application of different approaches focused on the issues such as ‘the importance of the selection of appropriate approaches’ and ‘the importance of classroom preparation’.

‘I think certain approaches can be applicable. But, the general classroom environment is important. I mean, it is necessary to prepare the class in accordance with the approach.’ (M1st)

‘I am thinking to do different things in the future. Activities, nice things... but, it depends either class or subject. What does the case require? I can adjust myself according to the situations.’ (C3rd)

Excerpts from prospective teachers realizing the deficiencies of traditional education provide good examples of influences of school experience course.

‘When students are exposed to traditional methods, they cannot learn in a meaningful way. That is why; such a situation drove me to ask myself what I would do if I were in such a situation. How could I do?... It led me to look for the answers.’ (M3rd)

Some of the prospective Math teachers, expressing the positive effects of school experience, associated the reason with the realization of importance of in-class interaction. It was clarified as follows:

‘I saw that teacher communication is very important. I should construct strong bonds, so that students can ask whenever they do not understand. Similarly, I can understand what they ask.’ (M7th)

Although participants generally mentioned about dominance of traditional instructions, lack of modern methods, and deficiencies of in-class interaction, they agreed on that they could use theoretical knowledge in real life. This can refer that they still value theoretical knowledge they possess. Moreover, the observed deficiencies related to instruction might cause participants to think about what to do and not to do while applying modern methods, which can be considered as a benefit for them (ex. Feiman-Nemser, 2001; Smith & Lev-Ari, 2005). On the other hand, this situation poses the disappoint-

ments with regards to expected outputs or observations, i.e. they did not benefit from the observations according to their expectations. Prospective teachers can sometimes be influenced from the methods and techniques of mentor teachers even if it conflicts with what they learned from the undergraduate courses. That is why selection of mentors and the practice schools is very crucial. A good selection cannot guarantee the quality of observations. The candidates should be guided and advised frequently to have highest benefits from school observations (Bates, Ramirez, & Drits, 2009).

Participants that expressed negative influences listed some reasons one of which is excessive content of the curriculum. This thought was exemplified like:

‘There are too many subjects to cover at school which cause me to doubt if I could manage to finish. Instruction program is based on constructivism, therefore, I cannot pass over quickly.’ (M1st)

One of the prospective Math teachers expressed concerns was about the workload of the course. Although they investigated curriculum, its content, and allocation of time during their education period, they criticized the flow of topics in terms of durations and meaningfulness. This might be again related to the failing points of mentor teachers during instruction.

The influence of central exam systems on lesson flow was mentioned as another reason and expressed as:

‘In schools, students’ points of views are very different. They are being prepared for the central exam and thus demand for the shortcuts of questions and answers. That is why, although I think that different approaches are needed, I am not sure about how the context would direct me.’ (M5th)

In Turkey, transition from high schools to higher education occurs with the help of a central university entrance exam. The exam includes multiple-choice questions that require the use of knowledge in a practical way. Both teachers and students put a high emphasis on this exam, and as a result, the education tends to be shaped in accordance with exam preparation inevitably (Kelecioğlu, 2002). This situation may bring about teaching result-based rather than process-based learning which in turn can lead to ignorance of conceptual relations and interpretations (Fırat & Yaratın, 2013). In our case, it was observed that some of the prospective teachers hesitated about the need for practicing different approaches due to being influenced in a negative way during the school observations.

Prospective CEIT teachers focused on infrastructural barriers:

‘It is not possible to learn a programme on the computer because even if you load it to a fully functioning computer, five students will share one computer. That means one will perform, others will just observe. It is impossible to monitor if they are learning. As a result, the methods are based on note taking.’ (C1st)

Although, Project FATİH is a huge step for the technology integration, there are still big gaps in middle schools. The number of computers per student is very limited. This kind of infrastructural problem can serve as a barrier (Ertmer, Ottenbreit-Leftwich, Sadık, Sendurur, & Sendurur, 2012), because it may become hard to apply constructivist methods as well as to motivate students.

Prospective teachers of both departments were agreed on the need of an increase in school experience period, a decrease in the number of prospective teachers per a mentor at schools, increase the number of school experience kind of courses in the curriculum.

‘I believe the school experience is a valuable process. I think it should last during the whole year. Moreover, I think the last year in teacher education institutions should be allocated to only teaching practice and school experience. The teachers should be selected carefully and one teacher should mentor less number of teacher candidates.’ (M7th)

‘I think rushing the last year as an intern is not good because our education takes four years. We take many courses. Learning would be more permanent if we practice as we take courses. Although courses are practice-based, it does not go beyond theory...’ (C4th)

Participants from two departments agreed on the necessity of longer and qualified practices. In addition, they focused on the need to strengthen the ties between theory and practice. The key here is the teacher education program, which should be designed in high quality rather than convenience (Goodland, 1990). This can be achieved through either revising the current program or investigating well-developed samples (Howey & Zimpher, 2006). Besides the program itself, supervisors in the university and mentors in the schools should also be trained in the light of the new program (Beck & Kosnik, 2002; Youens & Bailey, 2004). In that way, teacher candidates should receive meaningful feedback (Schulz, 2005).

4. Conclusion and Suggestion

For many years, scholars argued about teacher education and they focused on the importance of preparation of effective teachers with their knowledge about content and pedagogy. But in practice, the link between theory and practice is not as strong as it is supposed to be. Findings of this study indicate that before school experiences, prospective teachers mostly have similar expectations and excitements on experiencing the bridge between campus and school. A few prospective Math teachers showed differences by relating the issues of in-class communication. Moreover, focusing on meeting first time with the students and the mentor was another different issue mentioned by a prospective CEIT teacher. During these experiences, prospective teachers have reflected on many issues related to deficient links between campus and school because of the mentors’ traditional ways of teaching and inadequate use of different strategies. Nevertheless, prospective CEIT teachers emphasized in-class interactions more than others. These results represent the importance of choosing qualified mentors and schools (Margolis, 2007; Valencia, Martin, Place, & Grossman, 2009).

In Turkish teacher education programs, two courses are offered for students visiting schools and practice teaching. Both courses, school experience and teaching practice, are offered at the last year. Participants of this study clearly expressed that these courses are not enough to make the transition from theory to practice effectively. This finding is in line with the studies reporting inadequate experiences of prospective teachers in transition from theory to practice (Grudnoff, 2011) and the needs of change in teacher education (Korthagen & Kessels, 1999; Darling-Hammond, 2006; Zeichner, 2010).

This study is limited to 11 participants from two departments. For further studies, the number of participants can be increased and the differences between departments can be observed in details. Moreover, different research methodologies such as phenomenological research can be conducted in order to understand the overall transition process of prospective teachers.

5. References

- Bates A. J., Ramirez, L., & Drits, D. (2009). Connecting university supervision and critical reflection: mentoring and modeling. *The Teacher Educator*, 44, 90–112.
- Beck, C., & Kosnik, C. (2002). Components of a good practicum placement: student teacher perceptions. *Teacher Education Quarterly*, 29(2), 81–98.
- Boyd, D. J., Grossman, P. L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis*, 31(4), 416–440.
- Carter, K., & Anders, D. (1996). Program pedagogy. *The teacher educator's handbook: Building a knowledge base for the preparation of teachers*, 557–592.
- Cochran, K. F. (1993). Pedagogical Content Knowing: An Integrative Model for Teacher Preparation. *Journal of Teacher Education*, 44(4), 263–272.
- Coşkun, A., & Daloğlu, A. (2010). Evaluating an English Language Teacher Education Program through Peacock's Model. *Australian Journal of Teacher Education*, 35(6), 24–42.
- Cotthran D. J., Kulinna, P. H., & Garrahy D. A. (2003). "This is kind of giving a secret away...": students' perspectives on effective class management. *Teaching and Teacher Education* 19. 435–444.
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.
- Darling-Hammond, L. (2006). Constructing 21st-Century Teacher Education. *Journal of Teacher Education*, 57(3), 300–314.
- De Lange, J. (1996). Using and applying mathematics in education. In: A. J. Bishop, K. Clements, C. Keitel, J. Kilpatrick, & C. Laborde (Eds.), *International handbook of mathematics education* (pp. 49–97). Boston: Kluwer Academic Publishers.
- Ertmer, P.A., Ottenbreit-Leftwich, A., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers and Education*, 59(2), 423–435.
- Everhart, B., & Turner, E. (1996). Preservice clinical experiences. *The Journal of Physical Education, Recreation, & Dance*, 67(4), 62–65.
- Feiman-Nemser, S. (2001). From preparation to practice. Designing a continuum to strengthen and sustain teaching. *Teachers' College Record*, 103, 1013–1055.
- Firat, H.B., & Yaratan, H. (2013). Impact of external examinations on high school curricula: Perceptions of teachers and students. *Egitim Arastirmalari-Eurasian Journal of Educational Research*, 53(4), 1–18.

- Friedman, B., & Khan, P.H. (1994). Educating computer scientists: linking the social and the technical. *Communications of the ACM*, 37(1), 65-70.
- Frykholm, J. A. (1999). The impact of reform: Challenges for mathematics teacher preparation. *Journal of Mathematics Teacher Education*, 2(1), 79-105
- Garcia, T., & Pintrich, P.R. (1992). Critical thinking and its relationship to motivation, learning strategies, and classroom experience. Paper presented at the Annual Meeting of the American Psychological Association, Washington, DC, August.
- Gainsburg, J. (2008). Real-world connections in secondary mathematics teaching. *Journal of Mathematics Teacher Education*, 11, 199–219.
- Goodland, J. (1990). *Teachers for our nation's schools*. San Francisco: Jossey Bass.
- Graesser, A. C., & Person, N. K. (1994). Question asking during tutoring. *American Educational Research Journal*, 31(1), 104-137.
- Grudnoff, L. (2011). Rethinking the practicum: Limitations and possibilities. *Asia Pacific Journal of Teacher Education*, 39(3), 223-234.
- Hammerness, K., Darling-Hammond, L., & Bransford, J. (2005). Preparing Teachers for a Changing World. What Teachers Should Learn and be Able to Do. In L. Darling-Hammond and J. Bransford (Eds), *How Teachers Learn and Develop* (pp. 258-389), Jossey-Bass: Wiley.
- Herbel-Eisenmann, B. A., Hoffmann, A. J., & Seah, W. T. (2003). Understanding mathematics learning and teaching through beliefs, values and norms. In *81st Annual Meeting of the National Council of Teachers of Mathematics (Research Pre-session)*, April, San Antonio, TX.
- Hidi, S. (2006). Interest: A unique motivational variable. *Educational Research Review*, 1(2), 69-82.
- Howey, K., & Zimpher, N. (2006). (Eds.). *Boundary Spanners*. Washington, DC: American Association of State Colleges and Universities.
- Iancu-Haddad D., & Oplatka, I. (2009). Mentoring novice teachers: Motives, process and outcomes from the mentor's point of view. *The New Educator*; 5, 45-65.
- Jackson, P. W. (1974). *Life in classrooms*. New York: Holt, Rinehart & Winston.
- James C. MC, Virginia P. R., & Vicki E. B (2006). The Relationships of Student End-of-Class Motivation with Teacher Communication Behaviors and Instructional Outcomes, *Communication Education*, 55(4), 403-414.
- Kelecioğlu, H. (2002). Ortaöğretim Başarı Puanlarının Üniversiteye Girişte İki Aşamalı Sınavda Uygulanan ÖYS, ÖSS ve Tek Aşamalı Sınavda Uygulanan ÖSS İle İlişkileri, *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 23, 135–144.
- Kennedy, M. (1999). The role of preservice teacher education. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 54-85). San Francisco: Jossey-Bass.
- Korthagen, F., & Kessels, J. (1999). Linking theory and practice: Changing the pedagogy of teacher education. *Educational Researcher*, 28(3), 4-17.
- Kuyper, H., van der Werf, M.P.C., & Lubbers, M.J. (2000). Motivation, meta-cognition and self-regulation as predictors of long term educational attainment. *Educational Research and Evaluation*, 6(3), 181–201.
- Lee, O., & Brophy, J. (1996). Motivational patterns observed in sixth-grade science classrooms. *Journal of Research in Science Teaching*, 33(3), 585–610.
- Leshem, S. (2012). The Many Faces of Mentor-Mentee Relationships in a Pre-Service Teacher Education Programme. *Creative Education*, 3(4), 413-421.
- Lincoln, Y. S., & Guba, E.G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.

- Lortie, D. C. (1975). *Schoolteacher: A sociological study*. Chicago: University of Chicago Press.
- Margolis, J. (2007). Improving relationships between mentor teachers and student teachers: Engaging in a pedagogy of explicitness. *The New Educator*, 3, 75-94.
- McCormack, A. (1997). Classroom management problems, strategies, and influences in physical education. *European Physical Education Review*, 3, 102-115.
- McIntyre, D. J., Byrd, D. M., & Foxx, S. M. (1996). Field laboratory experiences. In J. P. Sikula, T. J. Buttery, & E. Guyton (Eds.), *Handbook of research on teacher education* (2nd ed.). New York: Macmillan Library Reference
- Meece, J. L., Wigfield, A., & Eccles, J. S. (1990). Predictors of mathematics anxiety and its influence on young adolescents' course enrollment intentions and performance in mathematics. *Journal of Educational Psychology*, 82(1), 60-70.
- Moyer P. S. & Milewicz, E. (2002). Learning to question: categories of questioning used by pre-service teachers during diagnostic mathematics interviews. *Journal of Mathematics Teacher Education* 5, 293-315.
- Pamuk, S., Çakır, R., Ergun, M., Yılmaz, H.B., & Ayas, C. (2013). The use of tablet PC and interactive board from the perspectives of teachers and students: Evaluation of FATİH project. *Educational Sciences: Theory & Practice*, 13(3), 1815-1822.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic Emotions in Students' Self-Regulated Learning and Achievement: A Program of Qualitative and Quantitative Research. *Educational Psychologist* 37(2), 91-106.
- Pintrich, P.R., Marx, R.W., & Boyle, R.A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research*, 63(2), 167-199.
- Retallick, M. S., & Miller, G. (2010). Teacher Preparation in Career and Technical Education: A Model for Developing and Researching Early Field Experiences. *Journal of Career and Technical Education*, 25(1), 62-75.
- Richmond, V. P. (1990). Communication in the classroom: Power and motivation. *Communication Education*, 39, 181-195.
- Schulz, R. (2005). The practicum: More than practice. *Canadian Journal of Education*, 28(1&2), 147-167.
- Segall, A. (2004). Revisiting pedagogical content knowledge: The pedagogy of content/the content of pedagogy. *Teaching and Teacher Education*, 20(5), 489-504.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15, 4-14.
- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1), 1-22.
- Simpson, A. W., & Erickson, M. T. (1983). Teachers' Verbal and Nonverbal Communication Patterns as a Function of Teacher Race, Student Gender, and Student Race. *American Educational Research Journal*. 20(2), 183-198.
- Smith, K. & Lev-Ari, L. (2005). The place of the practicum in pre-service teacher education. The voice of the students. *Asia Pasific Journal of Teacher Education*, 33, 289-302.
- Steen, L. A., & Forman, S. L. (1995). Mathematics for work and life. In I. M. Carl (Ed.), *Prospectus for school mathematics* (pp. 219-241). Reston: NCTM.
- Valencia, S., Martin, S., Place, N., & Grossman, P. (2009). Complex interactions in student teaching: Lost opportunities for learning. *Journal of Teacher Education*, 60(3), 304-322.

- Vertuno, E. M. (1995). Placing students in field experiences. In G. A. Slick (Ed.), *Preparing new teachers: Operating successful field experience programs* (pp. 29-37). Thousand Oaks, CA: Corwin Press.
- Yıldırım, A. ve Şimşek, H. (2005). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri*. Ankara: Seçkin Yayıncılık.
- Youens, B., & Bailey, M. (2004). The impact of quality assurance on mentor training in initial teacher education partnerships: a UK perspective, *Canadian Journal of Educational Administration and Policy*, 32(1), 1-24.
- Zeichner, K. (1996) Designing educative practicum experiences for prospective teachers, in: K. Zeichner, S. Melnick & M. L. Gomez (Eds) *Currents of reform in preservice teacher education*, New York: Teachers College Press.
- Zeichner, K. (2010). Rethinking the connections between campus courses and field experiences in college-and university-based teacher education. *Journal of Teacher Education*, 61(1-2), 89-99.