



## **A Comparison of Teacher Candidates' Self-Efficacy on being Teachers in Multi-Grade Classes: Cases of Ege University and Mehmet Akif University**

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### **Abstract**

The aim of this study is to investigate the effect of two different program practices (Activity theory and the Technology) on teacher candidates' level of self-efficacy on being teachers of multi-grade classes. The study was carried out by means of a mixed-method research design. The quantitative data was obtained by the self-efficacy scale developed. The quantitative data was analysed with Two-Way Mixed-Measured ANOVA. The qualitative data consisted of the semi-structured focus group interviews, the candidates' group reports and the self-evaluation reports. The study revealed that both of the program practices affected the candidates' self-efficacy levels at different levels. There was no statistically significant difference between the program practices in terms of the effect. However, it was found that the most important effect was between measurement levels. Based on the analysis of the qualitative data, it was revealed that the different activities depending on type of programs influenced the candidates' self-efficacy perceptions differently.

**Keywords:** Initial primary teacher education for multi-grade classrooms, curricular practice based on Activity theory, curricular practice based on Technology, self-efficacy, social cognitive theory.

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## INTRODUCTION

Multi-grade classes are teaching contexts formed either because of lack of teachers, classrooms, students, or sometimes educational needs. In this practice, a teacher takes the responsibility of two or more grades at the same time (Hargreaves, Montreo, Chau, Sibli& Thanh, 2001). According to Little (2001), multi-grade classes can be defined as the classes gathering students from different age groups. Multi-grade classes can be found in the regions with a scattered and rare population, and where there was a loss of population while having education at one level in the past. Besides, the existence of students at different levels or sometimes teachers giving pedagogical justifications lead up to this practice. Other than Turkey, multi-grade class practices can be seen in many developed countries such as England, France, Germany, Finland, Norway, Switzerland and Australia. In fact, according to 2000 data, 25,4% of the elementary schools in England and 40% of the schools in the north of Territories in Australia, and 89,2% of schools, 78% being in the country side, in Peru in 1998 were the schools with multi-grade classes (UNESCO, 2005). As for Turkey, the Ministry of National Education (MNE) announced this rate as nearly 35% based on 2011-2012 school year statistics (MNE, 2012).

Individuals graduating Elementary Education Programs of Education Faculties work at such schools in Turkey. Examining the program, it is seen that there is only one course preparing teacher candidates for exactly such schools. This course is "Teaching Multi-Grade Classes" and is a two-credit theoretical course in the last year of the program. The program also includes a "School Experience" course in which students only make observations in the spring term of the 3rd year, and a "Teaching Practicum" course in both terms of the 4th year. These practices do not help teacher candidates to gain an experience related to multi-grade classes since they are mostly conducted in the central elementary schools. However, Mulryan-Kyne (2006) states that knowledge; skills and qualifications unique to multi-grade classes should be gained through a teaching practicum in school contexts where there are actually multi-grade classes. Teacher candidates having such an opportunity would make them feel competent while working at these schools. Related studies conducted in Turkey (Aksoy, 2008; Çınar, 2004; Özben, 1997) shows that teacher candidates do not usually do their pre-service training at schools having multi-grade classes, but they are mostly appointed to such schools after their graduation.

In pre-service teacher education in Turkey consisting of a four-year learning process, it is aimed to train teacher candidates with a certain level of competence towards their knowledge in the subject area, skills and attitudes unique to that field of education apart from their general knowledge (MNE, 2008). Some researchers (Ülper & Bağcı, 2012) stated that competencies are two-fold; external and internal. In this definition, the external part is individuals being evaluated by other individuals using various measurement tools, and the internal part is evaluating themselves based on their own perceptions. This perception which can be described as self-efficacy is a concept developed by Bandura and one of the important concepts in social cognitive theory. This study focused on elementary teacher candidates' internal competencies, or self-efficacy beliefs towards teaching multi-grade classes.

### Theoretical Background

Bandura (1986) argued that in social cognitive theory, in order for individuals to successfully perform the necessary skills in a task or occupation depends largely on their judgement of themselves in that field. Although there are various definitions related to self-efficacy perception conceptualized as individuals' judgement of themselves, it can be seen that these definitions are not that different from the features that Bandura proposed. For example, Bandura (1986) defines the concept as "*Self-efficacy which is an important characteristic effecting the formation of behaviours is individuals' judgement of themselves with regard to their capacity of organizing the necessary activities for a task and performing it successfully*" (p.12). While Tschannen-Moren and Woolfolk Hoy (2001) describe it as "*Individuals expectations from themselves regarding their achievement level in a situation*", Woolfolk Hoy (2000) explains the concept as follows: "*Individuals' beliefs related to being able to organize their skills and to develop competencies for a new situation they encounter*". As seen, there are two elements that all the

three researchers emphasize. One of these is the skills towards a discipline or occupation individuals will carry out in the future, and the other is their expectations or beliefs for being able to perform these skills.

While this belief is sometimes their answer for the question "What can I achieve with my skills?", sometimes it is being able to coordinate their abilities and skills in dealing with and changing the situations they face. What is pointed out in self-efficacy beliefs is the capacity of what individuals can do, and these beliefs can be seen as a factor increasing internal motivation (Snyder, & Lopez, 2002). Pajares (2002) stated that although some people have certain abilities, they face problems because of their doubts; although some other people have limited abilities, they can perform various behaviours since they find themselves sufficient. In the studies particularly related to the disciplines of science and mathematics, the notion of self-efficacy was found to be a basic determiner in students' preference for career development and courses or majors (Pajares, 1996; Betz, 2000). Due to the concept's effect on the behavioural changes, it is observed to be commonly used in the field of education, especially in teacher education (Bandura, 1996; Shaughnessy, 2004; Woolfolk Hoy, 2000). Bandura (1977, 1997) explained the sources of expectations towards self-efficacy beliefs in four dimensions, which are individuals' personal experiences in an area of specialization, physiological and emotional conditions, comments regarding themselves based on others' experiences, and social approval. Bandura (1997) stated that one of the primary factors affecting individuals' self-efficacy beliefs is personal experiences because Bandura proposed that due to the cognitive structure, there is a positive correlation between level of achievement in individuals' experiences and their level of self-efficacy beliefs (1993, 1997). On the other hand, it should be noted that individuals' self-evaluation based on colleagues' actions and reactions towards the quality of their own actions are also influential. However, individuals may change their self-efficacy beliefs taking others' experiences as a measure. For instance, while the achievements of the models similar to themselves creates a positive impact on the individuals, their failure results in a negative impact. Furthermore, it was revealed that teacher candidates' level of perceptions regarding their self-efficacy vary based on the quality of the reactions they get from their friends or experienced colleagues. Similarly, it was observed that when individuals' physical and emotional condition is positive, their self-efficacy beliefs tend to be strengthened, and vice versa (Bandura, 1977, 1993, 1997; Pintrich & Schunk, 1996). Another point that should be mentioned here is the fact that there is a relationship among teachers' self-efficacy levels, and environmental factors like school climate, the professional guidance support received and the level of teaching difficulty (Hoy & Woolfolk, 1993; Woolfolk Hoy, 2000).

It is seen that the concept of self-efficacy is especially used widely in pre-service teacher education because of its strong determining feature in changing behaviour. (Bandura, 1996; Shaughnessy, 2004; Woolfolk Hoy, 2000). The studies on the comparison of self-efficacy levels of candidates in different training programs in terms of mental disability to make inclusive education (Loreman, Sharma, & Forlin, 2013), the change in the self-efficacy levels of the candidates in graduate programs such as early child school, primary and secondary school according to their program (Pendergast, Garvis & Keogh, 2011), longitudinal examination of self-efficacy levels during the candidates' four-year education and after they have found a job after graduation (Bümen & Türkan, 2013), differentiation in candidates' self-efficacy levels before and after teaching practice can be given as examples.

## **Problem**

Bandura (1997) stated that the practices performed towards professional specialization during the first year of teaching have significant effects on teachers' competencies. For this reason, Bandura (1997) argued that candidates' initial perceptions regarding their self-efficacy are shaped during teaching practicum and the first few years of teaching because they are the first experiences in profession. Hence Lowery (2002) states that the practicum is a very important part of the teacher education programs because it effects on creating both positive and negative beliefs towards teaching practices depending on the quality of practicum.

Consequently, Bandura pointed out these periods as critical and having a long-term effect on teacher efficacy. However, Woolfolk Hoy (2000) asserted that there are few longitudinal studies examining the notion of self-efficacy in the first years which are described to be a critical process.

Likewise, studies investigating the effects of program practices relating to pre-service elementary teachers' self-efficacy levels of teaching multi-grade classes (SLTM) are quite rare (Sağ, 2010). Most of the studies (Aksoy, 2008; Little, & Pridmore, 2004; Khan, & Khan, 2007; Şahin, 2003) showed that a considerable number of teachers did not want to teach multi-grade classes, and they explained the reasons for this as "inadequate physical conditions of the schools, insufficient professional guidance services and heavy workload". On the other hand, in another study conducted with teacher candidates, it was revealed that the candidates were anxious about being able to teach multi-grade classes (Sağ, 2009).

The two researchers aimed to examine the effects of program practices developed based on two approaches, i.e. activity theory and technology-supported, on teacher candidates' level of self-efficacy. Two basic points were considered in program practices enriched based on activity theory. One of these is to create a need for getting to know about the notion of schools with multi-grade classes which the teacher candidates would most probably be appointed to after their graduation. According to the theory, individuals, in this case teacher candidates are expected to synthesize their knowledge and beliefs related to multi-grade classes on a need basis after a dialectic process. In this sense, it is assumed that the candidates being faced with real experiences of multi-grade classes and performing the expected actions would make the knowledge gained to be more realistic (Bonnar & Bodkar, 1991; Ilyenkov, 1974; Tolman, 1999). As for the program practices developed based on technology, teacher candidates were exposed to videos recorded in multi-grade classes. It is known that educational videos provide permanent data for different situations and events, which gives individuals the chance for a detailed analysis and unlimited number of replays. In addition to this, videos are extremely effective tools that can be employed as evidence-based discussions and teaching aid when used strategically (Tan, & Towndrowb, 2009). With respect to the benefits of using videos in teaching, what researchers (Barrett, Lewin-Jones, Mitra, & Williamson, 2009; Tezer, 2008) stated that they increase students' interest and motivation, provide permanent learning and improve course achievement.

Besides, teaching candidates being able to teach effectively at schools with multi-grade classes is considered to be directly proportional to their levels of self-efficacy. In this regard, it was aimed to investigate the effect differences between practices within the Teaching Multi-Grade Classes course program developed based on two learning approaches at two different universities. Within this scope, two research questions of the study are as follows:

1. *Is there a significant difference between the pre-test and post-test scores of the candidates participating in the program practices developed based on activity theory and the practices developed based on technology?*
2. *What is the effect of the practices in different programs on the candidates' self-efficacy levels with regard to teaching multi-grade classes?*

## METHOD

### Research Design

The study employed "mixed design" which is described as split-plot. This research design was preferred to determine the effect of the practices in the Teaching Multi-Grade Classes course at two different faculties on teacher candidates' "self-efficacy levels of teaching multi-grade classes (SLTM)". Moreover, the study was also quasi-experimental since the participant groups were not determined through random sampling. The design is presented in Table 1.

Table 1 Two-Way Mixed-Measures ANOVA

Factor A, Groups (2 Level)		Factor B, Measurements (2 Level)	
Group 1 (Prog. based on activity theory)	Pre-test	—————→	Post-test
Group 2 (Faculty-based prog. supported by technology)	Pre-test	—————→	Post-test

As presented in Table 1, there were two factors in the study as group and time (2x2). First of the factors (row factor) shows different experimental conditions (program practices observed in Group 1 and Group 2). As for the second factor (column factor), it defines the repeated measurements (pre-test post-test levels) in order to represent the change based on time. The schools were determined for being convenient since they were the researchers' institutions (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2008).

## Participant Groups

Descriptions of the participants are presented as groups in Table 2.

Table 2 Description of participant groups

Groups	Total Number of Students		Participated Students	
	F	%	F	%
Group 1	84	100	71	85
Group 2	51	100	47	92
Total	135	100	118	87

As can be seen in Table 2, although there were 84 students in Group 1, the number of students taking the pre- and post-test were only 71 and the participation rate was 85%. As for Group 2, 47 of 51 students took the pre- and post-test, and the rate was 92%. Thus, 118 students participated in the study from both groups which was equal to 87%.

## Practices in the Programs

Group 1: Teaching practices in the multi-grade classes in this group were formed by enriching the course contents published by Higher Education Council (1997) based on the findings of the studies (Sağ, 2010) regarding activity theory in the Turkish context. Accordingly, centrally-defined course contents and activities were re-defined in a way to cover teaching and learning along with assessment processes.

For instance, within the scope of the teaching programs, teacher candidates were made to examine the syllabuses of the courses such as Introduction to Science, Social Studies, Science, and Religious Culture and Moral Knowledge which are taught in the same terms without exception of groups. In this process, the candidates participated in discussions on what sort of problems they would encounter and for these, what educational measures they could take while teaching, for instance, younger students, e.g. 1st graders, in order for them to gain the outcomes of the 3rd unit in Introduction to Science. Similarly, the candidates discussed how to solve the motivation problems and what they can do to enrich the course for this time more senior students, for instance 3rd graders gaining the outcomes of the 1st grade Introduction to Science. Another issue in the teaching practices was how the candidates can organize the courses conducted by each class such as Turkish and Mathematics in the form of teacher-/assignment-based. The third issue with regard to the programs was ensuring that each grade focuses on its outcomes while conducting courses such as Visual Arts, Physical Education and Music in three grades at the same time.

Another main point is related to learning, teaching and assessment. At this stage, the candidates were made to focus on the three different teaching practices mentioned above and assessment activities. In this sense, the candidates were asked to prepare "entertaining worksheets", performance-based "game activities" and use these in class. Furthermore, they were given the chance to see the structures they would encounter through images and photographs in order for to understand the "in-class dialectic structure" within the framework of activity theory. In the assessment process, the candidates were asked to develop various assessment tools based on the objectives of the lesson plans they prepared. In this regard, the candidates were requested to produce "observation forms" and "graded scales" along with tests measuring high-order thinking skills at "comprehension", "application" and "analysis" levels.

Another practice conducted on this issue was making the candidates to visit village schools with multi-grade classes for two weeks in accordance with the principle of the Higher Education Council (2007) regarding a part of teaching practicum being conducted at such schools. The visit in the first week aimed to make the candidates be familiar with the physical and administrative conditions of the school and how lessons in multi-grade classes are conducted, and meet the teachers and students. As for the visit in the second week, the aim was to provide the candidates an opportunity to teach these multi-grade classes at least two lessons a week. 7 elementary school with multi-grade classes which had easy access to Burdur city centre were determined. Based on the permission obtained from the provincial directorate for national education, the candidates were sent to practice schools in groups of four during April and May, 2013.

Group 2: The contents of the teaching program in this group included the concept of multi-grade classes, formation of these classes, learning-teaching process in such classes, planning teaching activities and organizing seating arrangement, classroom management, measurement and assessment, and teachers' responsibilities. The course contents were taught through video-based teaching by the faculty member. The videos included real classroom practices which were teachers' teaching in class, assigning works to groups, ways of achieving classroom management, and how they conducted measurement and assessment. In addition to this, a teacher working at a school with multi-grade classes was invited to the lesson at the University for an Interview. This provided an environment for exchange of experience for both the teacher and the candidates. Furthermore, the candidates examined the lesson plans used by the teacher who also shared photographs related to application. Apart from all these, the teacher candidates were asked to prepare a daily plan that can be used in a multi-grade class and draw seating arrangement for the classroom. The faculty member provided feedback for the plans and the drawings based on the points that should be strengthened and asked the candidates to revise their plans based on these feedback.

### **Data Gathering Tools**

Two data sets were obtained in the study. One of these were the quantitative data related to the candidates' self-efficacy gathered through the Self-Efficacy Scale for Teaching Multi-Grade Classes (SSTMC) developed by Sağ (2011). The other data set included the focus group interviews in both groups, group reports prepared based on observations of multi-grade classes visited during teaching practicum, and the self-evaluation reports individual teaching experiences within groups.

The initial version of SSTMC had three factors (Sağ, Savaş, & Sezer, 2009). However, the researcher (2011) argued in their following study based on the same data that the factor defined as "school administration" was not placed in the concept of 'teaching multi-grade classes' since it is valid for all teachers. For this reason, the second version of the scale including two factors which are program literacy, and learning-teaching and assessment processes was used. The pilot form was applied to 418 teacher candidates at the last year of the four-year elementary education program who were not selected randomly. Examining the values of the scale before factor analysis consisting of 19 items, it can be seen that the values were quite good for a start (KMO= ,92, BT= 5838,9, sd=171, p=,00, residual rate=% 33) (Büyüköztürk, 2007). The variance of the 9-item program literacy factor of the scale whose total variance being 60% was 31.10%, and the variance of the 10-item learning and assessment factor was 29%. The reliability coefficient ( $\alpha$ ) of the whole scale was calculated as .93, for the first factor .93, and for the second factor .90.

The second data set consisted of the focus group interviews of the teacher candidates, group reports prepared based on observations of multi-grade classes visited during teaching practicum, and the self-evaluation reports. The semi-structured focus group interviews in Group 2 were conducted thought the end of the term. The interviews were recorded with the consent of the participants, and then transcribed. The question that was asked during the interviews was "What is the contribution of the practices included in the course to your learning and self-efficacy related to multi-grade classes?". As for Group 1, group reports observations in multi-grade classes visited during teaching practicum, and the self-evaluation reports prepared based on teaching experiences were asked from the candidates. The

candidates were also requested to gather their reports under the following titles. The first of these was examining the school in terms of its physical condition such as its garden, location in the village, interior of the classrooms, notice boards and cleanness. For the second, the candidates were asked to examine the students while playing in the garden and during classes for their participation in terms of their social and academic characteristics. The third title was related to the candidates conducting multi-grade class activities. Furthermore, self-evaluation reports in which the candidates evaluated their peers' teaching experience were requested. The group reports were examined within the study and a total of six reports were gathered from each candidate. As for the self-evaluation reports, they were chosen among the individuals in the group under investigation.

### **Data Analysis and Interpretation**

In order to identify the effect of different programs on the candidates' self-efficacy levels, Two-Way Mixed-Measured ANOVA was employed. Characteristics such as the data gathering tool being a scale, Kolmogorov-Smirnov results of the pre- and post-test scores in Group 1, and Shapiro-Wilks results of the pre- and post-test scores in Group 2 having a significance value higher than .05 showing a normal distribution of group scores, group co-variances being equal for the dual combinations of measurement sets ( $F=1,59$ ,  $df_1=3$ ,  $df_2=1616100,61$ ,  $p>,05$ ), and the measurements being conducted separately for each examinee as pre- and post-tests shows that the necessary assumptions for this statistical test was met (Büyüköztürk, 2007, p. 79). In addition, Field (2006, p. 32) stated that "effect sizes are useful for providing an objective measurement of the significance of an effect...and clues for the reader in terms of presenting its contribution to the whole process" (p. 32-33). Field also mentioned that effect sizes being reported in studies are recommended by the American Association of Psychology (APA). In this study, the effect size was calculated and reported using the following formula:

$$\text{"Group 1 } \times \text{ Group 2} = \sqrt{(F(1, dfR)/F(1, dfR) + dfR)}$$

(Field, 2006, p. 294).

As mentioned above, the interviews were transcribed prior to the analysis. Both the interview transcripts and the reports were examined based on descriptive analysis. The analysis was conducted using a two-dimensional matrix as "interview notes, group reports and self-evaluation x contribution of the course and its effect on self-efficacy" as proposed by Miles and Huberman (1994). Due to the fact that there were few studies on teaching multi-grade classes, the themes and the codes used in documentary analysis were obtained from the transcripts. In this sense, documentary analysis aimed to reveal "the contribution to teaching multi-grade classes", and consequently "the effect on the candidates' self-efficacy" themes. Since the themes and codes were touched upon in the findings sections, they were not repeated here.

## **FINDINGS**

### **Existing of the Significant Difference between Two Program Practice**

In the study, it was firstly aimed to determine whether there was a significant difference between the pre- and post-test scores of the candidates participated in the program practices enriched based on activity theory, and the faculty-based practices supported by technology. First of all, the descriptive statistics regarding the scores obtained in the groups are presented in Table 3.

While the pre-test mean score towards the program literacy of the participants engaged in the practices enriched based on activity theory (Group 1) was 20.89, it increased to 31.34 in the post-test. On the other hand, the pre-test mean score of the participants engaged in the technology-supported practices (Group 2) was 16.00, and it increased to 37.11 in the post-test. As for the learning and assessment dimension, the pre-test mean score of the participants in Group 1 was 34.54, and it went up to 35.84 in the post-test. The pre-test mean score of the participants in Group 2 regarding this dimension was 27.23,

and the post-test mean score was calculated as 41.38. If examined based on the scale, the pre-test mean scores of the participants in Group 1 was 55.43, and the post-test mean was 67.18. As for Group 2, the pre-test mean score of the participants was 43.23, and the post-test mean was 78.47 (Table 3).

Table 3 Mean and standard deviation of self-efficacy scores based on factors and scale

Groups	Factors	n	Pre-test		Post-test	
			$\bar{x}$	sd	$\bar{x}$	sd
Practices based on activity theory	Program literacy	61	20.89	6.91	31.34	5.39
	Learning and assessment	61	34.54	7.45	35.84	6.38
	Scale	61	55.43	12.29	67.18	11.01
Technology-supported practices	Program literacy	47	16.00	5.21	37.11	4.61
	Learning and assessment	47	27.23	6.86	41.38	5.43
	Scale	47	43.23	9.74	78.47	9.68

Whether the pre- and post-test scores with regard to self-efficacy level of the two groups significantly differed was tested using Two-Way ANOVA. The results are presented in Table 4.

Table 4 Two-way ANOVA results for SSTMC pre- and post-tests

Source of Variance	KT	Sd	KO	F	p	r
Between groups	14127.051	107				
Group (Activity theory/Technology-supported)	10.857	1	7317.590	.082	.776	.001
Error	14111.049	106	102.744			
Within groups	47314.049	108				
Measurement (Pre-test/Post-test)	29305.590	1	29305.590	285.229	.000	.729
Group*Measurement	7317.590	1	7317.590	71.222	.000	.402
Error	10890.869	106	102.744			
Total	61441.100	215				

As seen in Table 4, SSTMC scores of the candidates participated in two different Teaching Multi-Grade Classes program practices significantly differed between the start and end of the experiment. In other words, it was determined that the factors being different intervention groups and repeated measurements had a significant and high effect on self-efficacy scores towards teaching multi-grade classes [ $F_{(1,106)}=71,22$   $p < ,05$ ,  $r=,402$ ]. This finding shows that the practices in both programs had different effects on the candidates' self-efficacy levels towards teaching multi-grade classes. It can be seen in Table 3 that the technology-supported faculty-based practices had a greater effect on the candidates self-efficacy levels than that of the ones enriched based on activity theory.

Moreover, since another aim of the researchers was to test the effect of two different program practices on the participants' SSTMC scores, the basic effect tests for group and measurement were also included. As presented in Table 4, SSTMC pre- and post-test mean scores of the participants in Group 1 and Group 2 were not significantly different, in other words, showed similarities, [ $F_{(1,106)}=,082$   $p>,05$ ,  $r=,007$ ]. Examining the statistics in terms of measurement effect, without the exception of groups, the difference in the participating candidates' SSTMC scores from the start and end of the experiment was significant and had a large effect [ $F_{(1,106)}=285,229$ ,  $p<,05$ ,  $r=,729$ ].

Büyüköztürk (2007) described the limitation of two-way ANOVA statistic as "*this test does not provide clear data on sources of the change in individuals, either.*" (p.89). For this reason, the candidates' evaluations had an important role in obtaining meaningful interpretations with regard to the programs

implemented. In this sense, the candidates' evaluations were examined. The next section covers the examination of the qualitative data.

### **The effect of the practices in different programs on the candidates' self-efficacy levels with regard to teaching multi-grade classes**

The qualitative data obtained from the candidates were defined under two themes being "the contribution of the course" and "its effect on the candidates' self-efficacy" in terms of the contribution of the practices included in the programs to the candidates' learning on teaching multi-grade classes. At the same time, the codes were defined based on the activities implemented in each group.

#### ***The contribution of the practices to the candidates' learning***

This theme focused on the candidates' evaluations of how and to what extent the practices/activities in the groups enhanced their learning on the elements forming "the structure of multi-grade classes".

*The group exposed to program practices enriched based on activity theory:* It was seen based on their visits during teaching practicum and their own experiences that the candidates in Group 1 made an effort to become familiar with and understand the characteristics of the schools they will work at, the school climate, and the structure and the mechanism of multi-grade classes. For this reason, the candidates' evaluations were considered to be defined under the codes "understanding" and "becoming familiar".

The schools: One of the candidates described the school they visited as *"The surrounding area is mainly green and there is a small lake near the trees where the ducks swim. I don't know whether it is selective perception, but I couldn't help thinking that 'Students would slip and fall in it, I wish they would surround it'."* based on its location in the village and the environmental characteristics (Group 1, self-evaluation report).

Another candidate group visiting a different school described the school location as *"The school is located in the village, but in an upland area... It is surrounded by walls which are not tall... Since it is located in a higher position, there are cliffs around it...these are dangerous for the children,"* (Group 2 report).

Another group mentioned that *"The school got 6 rooms, two of them being classrooms, one is the administrative room, and the other two are used as storage rooms. There is central heating, but it is not used due to high costs, instead a stove is used. It doesn't have a library. There is a large school garden, however it is not very useful. The grass being too long makes it hard to move on. The school has a toilet 50 meters away which is not that healthy."* (Group 3 report)

A group defined their school saying that *"Since it has an uninhabitable report, the school uses a temporary building which is actually a Quran course."* (Group 4 report).

Another candidate described their school stating that *"The school is a one-storey building and the toilet is outside. It is cleaner and more organized than I expected. However, the school garden can be a problem for students and teachers. The garden in front of the school is completely sandy and there is a cloud of dust while the students are playing around. It was me who was most afflicted with this situation since I have asthma,"* (Group 5, self-evaluation report).

A candidate in another group illustrated the school garden and its appearance mentioning that *"When I came to the school entrance, I had to go through a gate full of mud. Fortunately, after all the difficulty, I was able to get to the school which was a neglected building,"* (Group 6, self-evaluation report).

The classrooms: One of the groups described the classrooms stating that “<sup>1</sup>*There were 5 first graders, 2 second graders, 6 third graders and 4 fifth graders (in a classroom) and the seating arrangement was not suitable at all. They were in a very crowded environment,*” (Group 1 report).

With respect to the classrooms, another group asserted that “two teachers were working at the school and although the classrooms were clean, *the classroom of the first group in which first and second graders are taught together was small, and that of the second group in which third and fourth graders are taught was spacious,*” (Group 2 report)

About another school, the candidates stated that “*wall paint was old and crumbling, the school and the classrooms were neglected. It had a large corridor, unsuitable spaces for cleaning. The stove was placed just near the door. The distance between desks was narrow and difficult for students to pass through... All the furniture was spread around the classroom, nothing but a visual pollution. Furthermore, the classroom facing the north side effected the heating negatively. As soon as we entered the classroom, there was a cold and airless environment,*” (Group 3 report).

Another group wrote that “*...the students in the second group were arranged to sit separate to be able to work individually... Another point need to be mentioned is that while a teacher had a projector to use in in-class activities, another teacher only had a computer, other than that it was observed that almost all the classrooms had pictures and posters on the side of the wall for the grade close to it. For instance, on the wall close to the first graders, there were posters of number and letter while second graders had posters on social and current events,*” (Group 4 report).

Another group focused on seating arrangements during the classes: “*The seating arrangements of both groups were traditional and grade-based*” (Group 5 report).

The students: Based on the candidates' statements, it was seen that they observed the students to get to know them, played with and talked to them as well as participating their learning-teaching process.

A candidate described their interaction with students stating that “*We asked them about their dreams, played with them, had photographs taken together*” (Group 1, self-evaluation report)

Another group said that “*We met and talked to students, and played with them. They are really into playing. They kept calling us to play with them. In their free time, they always played games...*” (Group 2 report)

With respect to out of class interactions, another group asserted that “*We taught them some games. At first, we started playing with first and second graders. Then, third and fourth graders, and finally students from preschool joined us. With such a crowded group, we played entertaining games. They said that they never played these games and loved them,*” (Group 3 report).

Focusing on the students' transportation to school and their nutrition, a candidate stated that “*Since the school is far from many settlements, the students come to school by the shuttle service. They eat what they bring in their lunch box.*” (Group 4, self-evaluation report).

A candidate from another school focused on lack of technology skills expressing that “*We experienced the lack of technological devices and their use. However, we also saw that how the students were interested in what slipped out from our mouths.. The students who were already ignored by their parents were willing to listen to their teachers. There were children who were very smart and producing practical solutions, however if ignored, I'm worried about their future.*” (Group 5, self-evaluation report).

Another candidate stated that “*I randomly asked a few students how it is to be taught in a multi-grade course. The children were very shy and said they were not happy with it while glancing at their teacher. Moreover, there was one saying that 'our teacher always forgets us'. However, their biggest complaint is the chaos and the noise in the class. Well, it is also interesting that they were complaining about the chaos and noise that they create*” attracting the attention to the irony in the teachers' interest and complaints while questioning the students' satisfaction with the multi-grade class application (Group 6 self-evaluation report).

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<sup>1</sup> The reader explanation was added by the researchers to clarify the context.

Working life and climate: Another observation of the candidates focused on the teachers' working life and the schools' relationship with the environment. For instance, in one of these observations, they mentioned that the teachers used shuttle service, buses between districts and their cars in turns for transportation. The candidates learnt that some of the works at school such as cleaning and heating were done with the donations from the parents and the villagers by hiring workers in the village. Besides, the candidates observed that such works were done by staffed servants in two schools.

Another point that the candidates focused was the quality of the relationship among the teachers and between the teachers and the villagers. For instance, one of the candidates described the school climate *“like a family”*. It is seen that they reached this conclusion in the break of the first morning they visited stating that *“We buttered the bread toasted on the stove, and had organic and fresh-smelling tomatoes. In fact, we weren't hungry, but the atmosphere was so warm that we couldn't say no.* (Group 3 report).

Another observation was related to the teachers' communication with the villagers. Although there weren't any serious communication problems between the teachers and the villagers, the candidates described their relationship as *“advising villagers”*, *“knowing only the ones that have children”* and *“being not related to”* (Group 5 report).

With regard to their learning on multi-grade classes, the candidates in Group 1 mostly featured their visits to the application schools and their teaching experiences. It is understood that the candidates 'became familiar' with many characteristic related to multi-grade classes such as *“the schools' garden, toilets, appearance and location in the villages/the wall paints of the classrooms, posters on the notice boards/seating arrangements, the students' behaviours in and out of the classroom/the teachers' working life and climate, the nutrition problem of the students coming from distant areas, lack of technology skills, negligence of the teachers and complaints about the chaos and the voice in the classroom”* .

In addition, their statements such as *“(Referring to the cliffs near the school garden) the students may slip and fall, I wish they would surround it/ there is a cliff right behind it, these are dangerous for the children/ it has a toilet which is not healthy/ there is a dust cloud while the students play. Since I have asthma, it was me most afflicted with this situation/fortunately, I was able to reach the school which was a neglected building, inferences towards the nutrition of the students coming from distant places/lack of technological devices, the students' insufficiency in the subject areas/the teachers' negligence and the students' hunger for learning/the quality of the teacher-parent relationship”* shows that they started to 'understand' the structure of multi-grade classes.

*Technology-supported teaching practices:* Since the practices were conducted with a faculty-based approach, the candidates did not have a teaching experience in a multi-grade class. Therefore, with regard to the theme *“contribution of the course”* in the focus group interviews, the candidates talked about their expectations before taking the Teaching Multi-Grade Classes course and to what extent these expectations were met at the end of the term. For this reason, it was considered that the codes can be defined with the codes "expectations" and "effectiveness".

Two teacher candidates pointed out *“the reasons for opening schools with multi-grade classes and how they are organized, how the teaching is conducted in these classes, classroom management, planning lessons, teaching methodology, and how the seating is arranged”* .

Another group of three candidates emphasized *“time management”* and *“unwanted behaviour problems, possible gifted students or physically-, or mentally-challenged students in the class, and how to teach them, how to minimize the effect of student types that should not be modelled with peer victimization”* .

Besides, a teacher candidate said that they looked answers for the questions: *“what kind of advantages and disadvantages of multi-grade classes are there for teachers and students? For how long there is multi-grade class application? Is this only in our country? How can one teach to more than one grade at the same time?”* .

In their statements regarding to what extent they got answers for these questions after taking the course, the candidates generally agreed that the teaching practices were productive for them. In this respect, a teacher candidate stated that *“the course satisfied my curiosity and acknowledged me. I learnt about the classroom arrangement, planning lessons and their implementation.”*

Another candidate expressed that *“I don't overrate teaching multi-grade classes any more. I have an idea on what and how to do things after I learnt something, which helped me overcome my fears”* .

The 'expectations' of the teacher candidates participated in the faculty-based practices supported by technology included “*why there was a need for teaching practice in multi-grade classes, how it is organized and implemented/classroom management, how the lesson plans are prepared, how teaching methods are employed/seating arrangements, how teaching different types of students should be organized, peer victimization, minimizing the effects of student types that should not be modelled/advantaged and disadvantages of multi-grade classes, applications in other countries, and how to teach a class with more than one grade*”. At the end of the term, most of the candidates stated that their expectations were met, in other words the course was productive: “*the course helped me to satisfy my curiosity/I learnt about the structure of the class, lesson planning and implementation/I don't overrate teaching multi-grade classes any more*”.

### ***The effect of practices on the candidates' self-efficacy***

*The group exposed to program practices enriched based on activity theory:* It was seen that the candidates had complicated opinions and feelings since they would do such a practice for the first time. Based on the evaluations, it was understood that the candidates self-efficacy perceptions (themes) were mostly on the codes "anxiety", "facing difficulties, but achieving at the end" and "self-efficacy". Defining the candidates' evaluations under three steps being starting the lesson, implementing the lesson and post-lesson was considered to be beneficial in terms of understanding the process.

At the beginning of their teaching experience, a candidate in Group 1 asserted that “*This week, I will teach a multi-grade class for the first time in my life. I'm very excited, and hurried as well.*” (Self-evaluation report).

Another candidate said: “*It is indeed difficult to assign a work to a group, and take care of another group, but it is not impossible*” Group 2, self-evaluation report).

About their feelings before the lesson, a candidate said: “*I was nervous since I didn't have such experience before... I thought if I could do it or not until I started teaching in the village school...*” (Group 4, self-evaluation report).

Based on the pre-lesson statements of the candidates from three different groups, it was seen that they experienced some sort of 'anxiety' that could be defined as 'excited', 'hurried', 'difficult but not impossible', 'nervous' and 'I thought if I could do it or not'.

With respect to implementing the lesson as the second step, the candidates' evaluations are as follows.

The candidate implementing a math course in a class of first and second graders described the process stating that *I taught math to first and second graders. First graders were teacher-based, and the second graders were assignment-based. Since I had only 2 students in second grade, I achieved my goals in the lesson. One of the students, Şafak was very successful and I benefited from him in Fatma's assignments in peer teaching. After distributing the work sheets and making the necessary explanations, I started my lesson with the first graders. The beans that I took to the class as a material were effective in attention getting. Similarly, I didn't have any trouble with this grade since there were only 5 students. However, my students had some trouble in counting down. Another difficulty I face was that the students didn't express themselves orally.*” (group 1, self-evaluation report).

Another candidate described their teaching experience expressing that “*I tried to use cooperative learning, brainstorming, and six thinking hats, however the students had trouble in these since they were not used to. We tried to arrange the desks in groups. However, we couldn't be more effective since we didn't have enough materials.*” (group 2, self-evaluation report).

Based on the statements of the two candidates, it can be seen that they tried to use many practices related to teaching multi-grade classes such as teacher-/assignment-based teaching unique to multi-grade classes, and "preparing worksheets", "peer teaching", "cooperative learning", and "brain storming and six thinking hats". Yet, with regard to implementing the practices, the candidates were in the opinion that they had "difficulties" and "were not very effective".

After the experience, the candidates' self-efficacy levels were observed to show differences, similar to the previous steps.

A candidate described their experience as *“At the end of the first lesson, we learnt how to find the subtracted which is not provided in subtraction in first grade. When I checked the worksheets of the second graders in the break, I saw that all the answers were correct,”* (group 1, self-evaluation report).

It can be said that they were aware of their lacking aspects and hopeful about the future based on what a candidates stated after their teaching experience *“I think I challenged myself in "making an introduction and attention getting" compared to the previous lesson. I believe that I will improve my lacking aspects, and my first year and experiences are very important for this. I wasn't distracted as I thought.”* (Group 2, self-evaluation report).

A candidate in another school said: *“...I spent a lot of time with the students there doing many things. They were so sweet and willing to learn that their energy was reflected in me... I realized that this profession was very suitable for me,”* (Group 4, self-evaluation report).

The statements of the candidates after the teaching practice, for instance the first candidate "seeing the result of their actions", the second candidate "being aware of lacking aspects and confidence" and the last candidate "realizing how suitable is the profession for them", refer to their levels of self-efficacy beliefs. As seen, these levels were observed to change based on the quality of the candidates' experiences.

*The group exposed to faculty-based teaching practices supported by technology:* In order for the opinions of the candidates in this group to be comparable with the previous group, the statements were examined under the theme 'self-efficacy'. Besides, defining the codes based on the candidates' opinions was considered to be more appropriate in terms of the quality of the teaching practices in the group. Accordingly, it was seen that two characteristics emerged from the statements which were "feeling good" and "self-confidence".

For instance, the descriptions such as *“I can now plan a lesson for a multi-grade class by myself and while doing this, I can question what I included in the plan”* or *“I feel myself better compared to the beginning of the term considering the conditions of the schools which I will probably work at”* showed the perspective of the candidates related to such schools turned to positive.

Likewise, two other candidates asserted that the knowledge they gained in the teaching program strengthened their willingness to work in multi-grade classes: *"I think I improve myself in organizing the seating arrangement based on the lesson. I'm looking forward to starting the profession" "Am I ready? Sometimes yes, sometimes no; however compared to the beginning of the term, I'm definitely ready."*

On the "classroom management" dimension stated frequently with respect to the reality aspect of the teaching program, a candidate express that *“the course helped me be confident since I knew what to do for classroom management.”*

"Feeling better" and "self-confidence" were considered to define the candidates' statements, which were *“I can now plan a lesson, and question what I included in it”, "I feel better compared to the beginning of the term”, “I am definitely ready compared to the beginning of the term.”* and *“knowing what to do helped me be confident”*.

## CONCLUSION AND DISCUSSION

Having a comparative aspect in a sense, the main of this study was not to compare to faculties implementing the Teaching Multi-Grade Classes course, on the contrary, it was to make descriptions and conclusions with regard to the differences in self-efficacy levels emerged due to program practices enriched based on two different theories. The study was described as quasi-experimental since the groups were not assigned randomly. Furthermore, it is known that due to this aspect being one of the limitations of the study, the results of the analysis cannot be explained as "only the effect of the programs implemented". The reason is that there could be many other factors affecting the candidates' SLTM such as the individuals' perception of teaching profession and faculty-based factors that could not be controlled (Cook, & Wong, 2008). To overcome this problem, the programs implemented by the faculties were

defined with a theoretical background in detail. In this respect, the candidates' opinions regarding the practices were also obtained in addition to the quantitative data gathered through the scale to determine self-efficacy levels, and data triangulation was tried to be achieved by asking for the reports they prepared (Şimşek & Yıldırım, 2007). Moreover, according to Woolfolk Hoy's (2000) remark that the studies on self-efficacy should cover a long period of time, the fact that the current study was conducted in a way to spread throughout the term is one of its positive aspects. Likewise, the same entrance requirements being used in both faculties and the cities in which these faculties are located being geographically far from each other were two other positive aspects in terms of ensuring the homogeneity of the participants and preventing interaction in-between.

Two different findings were revealed in the current study. The first of the findings in the first group and obtained based on the quantitative data was that the program practices implemented in both faculties and measurements at different times affected the participants' self-efficacy levels significantly in a positive way. The second finding in this group was that there were no significant differences between the effects of program practices in both groups. Finally, SLTM scores of the candidates participated in the study without the exception of groups significantly increased from pre-test to post-test.

The descriptive analysis findings based on qualitative data was the dimension of the study. The findings in this respect were examined in two steps as "the contribution to the candidates' learning of multi-grade classes" and "the effect on their self-efficacy towards teaching multi-grade classes" in a way to support each other. With regard to their learning on multi-grade classes, the candidates in Group 1 mostly featured their visits to the application schools and their teaching experiences. In this regard, based on their visits and experiences, it can be seen that the candidates *'became familiar'* with many characteristics of multi-grade classes and started to *'understand'* the structure of these classes. On the other hand, the candidates participated in the faculty-based practices supported by technology mostly had *'expectations'* about their curiosity and stated that the course was *'productive'*.

The effect of the program on the candidates' self-efficacy levels is the second finding based on the qualitative data. The effect of the program practices enriched based on activity theory on the candidates' self-efficacy seems to be under three levels which are "*seeing the result of their actions*", "*becoming aware of their lacking aspects and the existence of self-confidence*" and "*realizing that the profession is suitable for them*". In this process, it was observed that at the beginning, the candidates were *'anxious'* about whether they could carry out those skills, *'having difficulties, but achieving at the end'* related to the problems they encountered in classroom management, and at the end of the process, they had *'self-confidence'* and looked at the future with hope. The effect of faculty-based practices supported by technology on the candidates' self-efficacy levels revealed as *'feeling better'* and *'having self-confidence'*. Feeling better was defined as *'organizing a multi-grade lesson by for instance planning the lesson/questioning the lesson/knowing what to do for classroom management/implementing what was designed in a multi-grade class/feeling ready'*. It can be said that its effect on self-efficacy levels was very positive: "*Compared to the beginning of the term, definitely yes, I'm ready/knowing what to do made me feel self-confident*".

It can be argued that the participants in the group implementing practices based on activity theory having chance to see the physical conditions of the multi-grade classes, observing the process in class and teaching in these classes were provided an opportunity to make more realistic judgements towards their self-efficacy levels. As also seen in the findings based on the qualitative data, while the codes "becoming familiar" and "understanding" were featured in the candidates' observations related to their self-efficacy beliefs, the codes related to the profession were evident based on their actual teaching experience. As for the findings obtained from the candidates participating faculty-based practices supported by technology, their statements including "being curious", "meeting their expectations" and "feeling better" were based on very abstract images rather than real observations and experiences. However, although there were no statistically significant difference on which program practices had a greater effect on the candidates' self-efficacy levels, the self-efficacy scores of the candidates participating in technology-supported practices (Group 2) were higher than that of those participating in the practices based on activity theory (Group 1). Yet, as can be inferred from the findings based on the qualitative data, it is argued that the quantitative

findings should be interpreted carefully. The reason is that while the findings of Group 1 reflects the candidates' observations and experience in multi-grade classes, the findings of Group 2 represents the candidates' abstract images of these classes. Even though the findings of some research (Bümen and Özaydin, 2013) indicate student teachers' self-efficacy rising from first year to last year of pre-service education, Pendergast, Garvis and Keogh (2011) state that the arithmetic mean of the candidates' self efficacy levels in post-test scores are lower than the arithmetic mean of the post-test scores in three programs they examined similarly, and that might be the reason for the teaching practices may have a "shock" effect on them. A similar finding overlaps Atay's (2007) findings that candidates' post-test self-efficacy level scores, in terms of teaching strategies, after teaching practice significantly decreased compared to their pre-test scores. However, Bandura (1997) stated that although one of the most important factors affecting individuals' self-efficacy beliefs is their personal experiences, there is a direct propositional relationship between their achievement level in personal experiences and level of self-efficacy beliefs, and an inverse relationship between the difficulty of these experiences and level of self-efficacy beliefs. Consequently, the participants in Group 1 focus on the schools' negative aspects in terms of physical conditions, students not being taught at desired levels and having difficulties while teaching could be the key reason for the higher post-test mean scores in Group 2.

Based on the results of the study, the visits for seeing the multi-grade classes on-site, giving the candidates opportunities for teaching practice, bringing sample practices to class via videos and meeting teachers working at schools with multi-grade classes within the Teaching Multi-Grade Classes course can be said to affect the candidates' level of self-efficacy perception in a positive way. This finding is consistent with that of Sağ (2010) who found, in their study comparing traditional and activity theory based program practices that "although both types of practices had a positive effect on the candidates self-efficacy perceptions, the practices based on activity theory was more effective". Based on these findings, the following suggestions can be offered towards elementary teacher candidates' being able to teach multi-grade classes and their self-efficacy perceptions in this respect: 1) making observations and spending time with students/teachers on a planned-basis whenever required by the profession, 2) conducting teaching practices, and participating in discussing with peers and experienced teachers on these practices, 3) using videos regarding multi-grade classes, 4) meeting teachers of multi-grade classes at faculties, and 5) designing activities for more than one grade and different levels, and implement these in class.

On the other hand, as can be inferred, the findings related to the self-efficacy levels of the candidates participating the practices based on activity theory were limited to the visits within teaching practicum and teaching practice. However, practices such as visits and teaching practices are two different applications which complete each other. When the candidates were asked to make evaluations based on the course practices, it was seen that they limited these only to visits and teaching practices, ignoring all the other practices at the faculty. However, this problem was not observed in the data of the group participated in faculty-based practices supported by technology. For this reason, researchers who will study the effect of different types of programs on self-efficacy levels in a comparative way are recommended to be careful about the holism of the program. Another suggestion is for researchers considering conducting a study towards the self-efficacy levels of teacher candidates teaching multi-grade classes. Only the primary source of data was used in this study. However, as stated by Bandura (1996), self-efficacy belief is a result of individual's own thinking and psychological state at that time (Bandura, 1977, 1993, 1997; Pintrich & Schunk, 1996), as well as the opinions of those in the social environment related to his/her experiences at practice schools and their attitudes (Woolfolk, & Hoy, 1993; Wollfolk Hoy, 2000). Another issue that needs to be examined is the relationship between the difficulty of the personal experiences that mostly affect the candidates' self-efficacy perceptions, and environmental factors such as the physical conditions of the classrooms and receiving professional guidance.

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