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INVESTIGATING PRESERVICE SCIENCE TEACHERS' LEVEL OF USING SPREADSHEET PROGRAM IN ACCORDANCE WITH THE PURPOSE OF THE COURSES*

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ABSTRACT

Spreadsheet and chart programs are widely used in order to present the current data in a more meaningful and visual manner in the courses related to sciences. Within that context the aim of this study is to provide an answer to the question "What is the level of preservice teachers' application of the most popular spreadsheet program in accordance with the purpose of the course that is measured on performance basis?" The aim of this analysis is to determine the level of preservice science teachers' application of the most popular spreadsheet program in accordance with the purpose of the course that is measured on performance basis. Besides, this study aims to unveil any potential correlation with certain demographic features of preservice teachers. Analysed demographic attributes of preservice teachers are "gender, condition of having a personal computer or not and condition of having a training for using computer or not". In the research, correlational screening model was used. Research group is composed of 54 preservice teachers (43 females, 11 males) who enrolled in 3rd grade of Science Teaching program of Gazi University in spring term of 2013-2014 academic year. Test of Plotting by Using Spreadsheet Program (TPUSSP) was used as data collection tool in the study conducted. This test is composed of 4 performance based questions formed with 1 table and 3 chart plotting items. Findings of the study revealed that there is a significant relation between scores obtained from the TPUSSP by preservice teachers and gender. It is determined that mean TPUSSP

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scores of female preservice teachers were higher compared to males. Besides, it is realized that there was not a significant difference between the condition of having a personal computer and mean TPUSSP scores obtained by preservice teachers. Similarly, it is found that there was not a significant difference existed between the condition of having computer training and mean TPUSSP scores obtained by preservice teachers. It can be seen that preservice teachers achieved the lowest performance in the questions about creating chart whereas the highest performance in questions of creating pie chart and line chart. Based on the mean scores obtained, it can be stated that performances of preservice teachers are at medium level (66 %). As a suggestion, further studies can be conducted considering how drawing skills have changed before and after a Computer course or training offered to improve practical skills to use the mentioned spreadsheet program in line with course purposes. It is also suggested to conduct a further study to investigate how drawing skills improved after taking a training course on Computer competency or attending a developmental class on how to use spreadsheet program in line with course purposes. By negotiating with computer instructors they can be informed about the incompetency of preservice teachers and they can be supported to focus more on the kind of performance skills that preservice teachers would often use in line with the purpose of their course.

STRUCTURED ABSTRACT

Spreadsheet and chart programs are widely used to present the raw data in a more meaningful and a visual way in the lessons related to sciences. Tables and charts are visual assistances to make sense of figures, understand formulas and interpret relations between variables (Temiz and Tan, 2009). "Table and chart drawing" is one of the scientific process skills in science teaching and teachers are supposed to exhibit these skills. A table or a chart can, in certain cases, summarize a long paragraph well, and it can help students to focus on learning. It is vital for teachers to prepare in-class teaching materials beforehand. It is also essential to determine and create table and charts in line with different issues as regards the subject to teach. Preservice teachers are asked to use MS Excel program while drawing skills are determined using spreadsheet program. Different spreadsheet programs are also available except for MS Excel, and it can be indicated as a limitation of the study.

Problem statement of the study can be stated as "What is the level of preservice teachers' application of the most popular spreadsheet program in accordance with the purpose of the course that is measured on performance basis?" The aim of this analysis is to determine the level of preservice science teachers' application of the most popular spreadsheet program in accordance with the purpose of the course that is measured on performance basis. Besides, this study aims to unveil any potential correlation with certain demographic features of preservice teachers. Analysed demographic attributes of preservice teachers are "gender, condition of having a personal computer or not and condition of having a training for using computer or not".

In the research, correlational screening model was used. Research group is composed of 54 preservice teachers (43 females, 11 males) who

enrolled in 3rd grade of Science Teaching program of Gazi University in spring term of 2013-2014 academic year. Test of Plotting by Using Spreadsheet Program (TPUSSP) was used as a data collection tool in the study conducted. This test is composed of 4 performance based questions formed with 1 table and 3 chart plotting items.

Gradational scoring key (rubric) was used in order to determine scores which preservice teachers got from performance questions in TPUSSP. Teachers tried to complete 4 performance tasks involved in the test in computer environment and scoring was performed for the indicators in each performance task: "0 point" when it was not conducted, "1 point" when it was partially conducted and "2 points" when it was completed. Rubric of 41 articles was prepared for 4 performance questions involved in the test. The highest point to get in TPUSSP is 82 when all drawings are completed accurately. When it is examined according to sub-dimensions formed by four performance questions in the test, the highest scores to take are 24 for table, 16 for pie chart, 24 for column chart and 18 for line chart creating.

Findings of the study revealed that there is a significant relation between scores obtained from the TPUSSP by preservice teachers and gender. It is determined that mean TPUSSP scores of female preservice teachers were higher compared to males. Besides, it is realized that there was not a significant difference between the condition of having a personal computer and mean TPUSSP scores obtained by preservice teachers. Similarly, it is found that there was not a significant difference existed between the condition of having computer training and mean TPUSSP scores obtained by preservice teachers.

It is found that preservice teachers achieved the lowest performance in the questions about creating chart whereas the highest performance in questions of creating pie chart and line chart. Based on the mean scores obtained it can be stated that performances of preservice teachers are at medium level (66 %).

As a suggestion, further studies can be conducted considering how drawing skills have changed before and after a Computer course or training offered to improve practical skills to use the mentioned spreadsheet program in line with course purposes. It is also suggested to conduct a further study to investigate how drawing skills improved after taking a training course on Computer competency or attending a developmental class on how to use spreadsheet program in line with course purposes. By negotiating with computer instructors, they can be informed about the incompetency of preservice teachers and they can be supported to focus more on the kind of performance skills that preservice teachers would often use in line with the purpose of their course.

Keywords: Skills of science teachers, science education and technology, spreadsheet program, creating table, creating chart

FEN BİLGİSİ ÖĞRETMEN ADAYLARININ TABLOLAMA YAZILIMINI DERS AMACINA UYGUN ŞEKİLDE KULLANABİLME DÜZEYLERİNİN İNCELENMESİ

ÖZ

Fen bilimleri ile ilgili derslerde, eldeki verilerin daha anlamlı şekilde ve görsel olarak sunulması açısından tablolama ve grafik programları yaygın şekilde kullanılmaktadır. Bu bağlamda yapılan araştırma ile “Öğretmen adaylarının tablolama yazılımları içerisinde en yaygın kullanılan bir programı, performansa dayalı bir yöntemle ölçülen dersin amacına uygun olarak kullanabilme düzeyleri nedir?” sorusuna yanıt aranmak istenmiştir. Araştırmanın amacı, Fen bilgisi öğretmen adaylarının tablolama yazılımları içerisinde en yaygın olarak kullanılan bir programı, performansa dayalı bir yöntemle ölçülen dersin amacına uygun olarak kullanabilme düzeyleri ile öğretmen adaylarının bazı demografik özellikleri arasında ilişkinin olup olmadığının belirlenmesidir. Öğretmen adaylarının incelenen demografik özellikleri “cinsiyet, kendilerine ait bilgisayarı olup olmama ve bilgisayarla ilgili bir eğitim alıp almama” durumlarıdır. Araştırmada ilişkisel tarama modeli kullanılmıştır. Araştırmanın çalışma grubunu, 2013-2014 eğitim-öğretim yılı bahar döneminde Gazi Üniversitesi Fen Bilgisi Öğretmenliği programının 3. sınıfında öğrenim görmekte olan toplam 54 (43 kadın, 11 erkek) öğretmen adayı oluşturmaktadır. Yapılan araştırmada veri toplama aracı olarak, Tablolama Programını Kullanarak Çizim Yapma Testi (TPKÇYT) kullanılmıştır. Bu test, 1 adet tablo ve 3 adet grafik çizme becerisine ait toplam 4 adet uygulama sorusundan oluşmaktadır. Araştırma sonucunda, öğretmen adaylarının TPKÇYT’den elde edilen puanlar ile öğretmen adaylarının cinsiyetleri arasında anlamlı bir ilişkinin olduğu görülmüştür. Kadın öğretmen adaylarının TPKÇYT’deki puan ortalamalarının erkeklere göre daha yüksek olduğu belirlenmiştir. Ayrıca, öğretmen adaylarının kendilerine ait bilgisayarları olup olmama durumu ile TPKÇYT’den aldıkları puanların ortalamaları arasında anlamlı bir farklılık olmadığı saptanmıştır. Benzer şekilde, öğretmen adaylarının bilgisayarla ilgili bir eğitim alıp almama durumları ile TPKÇYT’den aldıkları puanların ortalamaları arasında da anlamlı bir farklılık olmadığı tespit edilmiştir. Öğretmen adaylarının en düşük performansı tablo oluşturma sorusunda ve en iyi performansı pasta grafiği ve çizgi grafiği oluşturma sorularında gösterdiği görülmektedir. Genel ortalama açısından öğretmen adaylarının testteki performansların orta düzeyde (% 66) olduğu ifade edilebilir. Öneri olarak, Bilgisayar dersini veya belirtilen tablolama programını ders amacına uygun şekilde kullanabilme becerisini geliştirme amaçlı olarak eğitim almadan önce ve aldıktan sonra çizim becerilerinin nasıl değiştiğiyle ilgili olarak başka bir araştırma yapılabilir. Bilgisayar derslerini okutan öğretim elemanları ile görüşülerek, bu araştırma ile ortaya çıkan adayların yetersiz oldukları ve alanlarında derslerinin amacına uygun olarak uygulamada sık kullanacakları becerileri geliştirmeye yönelik bilgisayar uygulamalarına ağırlık vermeleri önerilebilir.

Anahtar Kelimeler: Fen bilgisi öğretmen yeterlikleri, fen eğitimi ve teknoloji, tablolama programı, tablo oluşturma, grafik oluşturma

Introduction

In our day, teachers who have improved themselves and had knowledge and technical equipment suitable for today's conditions have replaced with teachers who have used the information obtained before teaching. In this century, computer use and its integration with courses are important parts of skills that can be classified among abilities and competencies of any qualified teacher. It is detected that individuals whose computer self-efficacy perception is high are more successful in computer use, maintain self-confidence and they are ready to take responsibility and more successful in fulfilling their responsibilities. In terms of training qualified teachers of the future, providing high quality training to preservice teachers in the education faculties is remarkably salient.

Teachers use technology to increase diversity and attraction of class activities (Ruthven et al., 2004). Computers are used as a tool to achieve curriculum purposes (Akker et al., 1992). A successful computer aided learning is related to pedagogical knowledge of a teacher (Pétursdóttir, 2012). Teachers need to be supported so as to be active in using technology in their classes. In the technical domain assistant personnel should be available in order to prevent and solve any potential hardware and software problems (Bitner and Bitner, 2002).

There is a significant relationship between certain elements such as computer self-efficacy, attitude towards the internet and achievement in computer lesson (Serin et al., 2010). Yıldırım (2000), in his study in which he analyzed attitudes of preservice teachers and in-service teachers towards computers after they taking computer lessons determined that there is a considerable improvement in the attitudes of teachers after attending lessons on computer literacy. Ocak and Akdemir (2008) determined as a result of their study that computer literacy developed by science teachers can increase use of computer and also provide integration in class as a teaching instrument. Mitra (1998) in a research with students at undergraduate level found that the most frequently used application was first Word processor followed by calculation programs.

Spreadsheet and chart programs are widely used to present the raw data in a more meaningful and a visual way in the lessons related to sciences. Tables and charts are visual assistances to make sense of figures, illustrate formulas and interpret the relations between variables (Temiz and Tan, 2009). "Table and chart drawing" is one of the scientific process skills in science teaching and teachers are expected to possess such skills. A table or a chart can at times summarize a long paragraph well, and it can help students to focus on learning. It is salient that teachers prepare in-class teaching materials. It is also highly imperative to determine and create table and charts in accordance with any conditions encountered about the subject to teach. Preservice teachers are asked to use MS Excel program while drawing skills are reliant upon the use of spreadsheet program. Different spreadsheet programs are also available except for MS Excel and it can be classified as a limitation.

Problem statement of this study is "What is the level of preservice teachers' application of the most popular spreadsheet program in accordance with the purpose of the course that is measured on performance basis?" The aim of this analysis is to determine the level of preservice science teachers' application of the most popular spreadsheet program in accordance with the purpose of the course that is measured on performance basis. Besides, this study aims to unveil any potential correlation with certain demographic features of preservice teachers. Analysed demographic attributes of preservice teachers are "gender, condition of having a personal computer or not and condition of having a training for using computer or not".

Method

In the research, correlational screening model was used. According to Karasar (2004), this model is intended to determine presence and degree of covariance between two or more variables. Research group is composed of 54 preservice teachers (43 females, 11 males) who enrolled in

3rd grade of Science Teaching program of Gazi University in spring term of 2013-2014 academic year.

Although a few performance based tests were developed for evaluating students' skills on creating and plotting handmade tables and charts, there was not any computer and performance based instrument detected related to creating tables and charts in accordance with the purposes of science classes (Ateş, 2001; Uyan and Önen, 2013).

Test of Plotting by Using Spreadsheet Program (TPUSSP) was used as data collection tool in the study conducted. Teacher candidates were provided with TPUSSP as color prints and they were asked to fulfill drawings in the test by applying computer environment. Implementation took nearly 60 minutes. An arrangement was made in a way to deliver a computer for each teacher candidate in computer laboratory. In addition, prepared objects were saved as a file on desktop screen which teacher candidates would use in drawing, and teacher candidates were informed on use of these objects.

The reason why small images needed in the practice stage was provided as already prepared for preservice teachers is because drawing abilities of preservice teachers could not be measured. It was only intended to measure their abilities to put these small images into proper places in tables or charts. In a similar way, the reason why the needed in creating chart during practice was provided already prepared is to help preservice teachers save time. Ability of placing input data in the table was measured in table creation therefore, it wasn't required to measure ability of placing input data in the table for other applications once more.

TPUSSP, a computer and performance based test, was developed by the researchers and used in order to measure abilities of preservice science teachers to create tables and charts by using spreadsheet program. The test is composed of 4 performance questions in which drawing skill is measured (1 table, 1 pie chart, 1 column chart and 1 line chart). Tables and charts included in the test in terms of content validity were determined based on drawings in the current science, textbooks and workbooks. All tables and charts in the textbooks and workbooks were collected inside a data pool and classified by their common properties. Upon consulting to experts their opinions were used and the final version of this classification revealed that the test would consist of 4 performance questions (Yenikalaycı, 2015). The table and graphs in the test are presented in Figure 1, Figure 2, Figure 3 and Figure 4 respectively.

Kas Çeşitleri	Resim	Çalışma Şekli		Vücuttaki Yeri						Yapısı	
		İsteğimizle	İsteğimiz Dışında	Kol	Böbrek	Mide	Bacak	Kalp	Parmak	Çizgili	Düz
Kalp Kası	Resim 1										
Çizgili Kas	Resim 2										
Düz Kas	Resim 3										

Figure 1. Table in TPUSSP

Figure 2. Pie Chart in TPUSSP

Figure 3. Column Chart in TPUSSP

Figure 4. Line Chart in TPUSSP

Gradational scoring key (rubric) was used in order to determine scores which preservice teachers got from performance questions in TPUSSP. Integrative and analytical are the two types of scoring instructions that describe performances of students and involve a certain number of categories and that are effectively bordered. In this research performance of preservice teachers was determined by analytical scoring method. Analytical scoring requires independently grading the performance or product parts and followed by computing total score by adding this partial score (MEB, 2005).

Structure validity of the test is ensured as rubrics were developed to evaluate any performance question involved in the test, and requires stages and performance indicators for the performance question. Performance indicators in the rubrics were determined based on performance indicators specified for the relevant drawing in computer course program taught at undergraduate level.

Teachers attempted to complete 4 performance tasks involved in the test in computer environment, and scoring was performed for the indicators in each performance task: “0 point” when it was not conducted, “1 point” when it was conducted partially, and “2 points” when it was completed. Rubrics and performance indicators prepared for each performance question are presented in Table 1, Table 2, Table 3 and Table 4.

Table 1. Rubric and Performance Indicators for Creating Table

Performance question	Performance indicators
Creating table	1) To be able to create general frame of table
	2) To be able to add line, column and set cell
	3) To be able to delete line, column and set cell
	4) To be able to change row height, column width
	5) To be able to enter text and figure into table
	6) To be able to change font properties of data
	7) To be able to align data by angle into set cell
	8) To be able to remove header line of table
	9) To be able to add prepared small image from file to table
	10) To be able to form table borders
	11) To be able to compound cells using merge and center button
	12) To be able to save work page

Table 2. Rubric and Performance Indicators for Creating Pie Chart

Performance question	Performance indicators
Creating pie chart	1) To be able to create a proper pie chart using chart wizard
	2) To be able to change dimensions of the chart
	3) To be able to move the chart near the table involving data
	4) To be able to add textbox over the chart
	5) To be able to change font, size and thickness of the types on chart
	6) To be able to put percentage value (%) and text on charts
	7) To be able to change design (color-filling) properties of chart
	8) To be able to save work page

Table 3. Rubric and Performance Indicators for Creating Column Chart

Performance question	Performance indicators
Creating column chart	1) To be able to create a proper column chart using chart wizard
	2) To be able to add title into chart
	3) To be able to name x and y axes of chart
	4) To be able to change chart sizes
	5) To be able to convert columns of chart into 3-dimensional form
	6) To be able to move the chart near the table involving data
	7) To be able to add horizontal gridlines on the chart
	8) To be able to add textbox on the chart
	9) To be able to change font, size and thickness of the types on chart
	10) To be able to put percentage value (%) and text on charts
	11) To be able to change design (color-filling) properties of design
	12) To be able to save work page

Table 4. Rubric and Performance Indicators for Creating Line Chart

Performance question	Performance indicators
Creating line chart	1) To be able to create a proper line chart using chart wizard
	2) To be able to add title into chart
	3) To be able to name x and y axes of chart
	4) To be able to change chart sizes
	5) To be able to move the chart near the table involving data
	6) To be able to add horizontal and vertical gridlines on the chart
	7) To be able to add prepared small image from file to chart
	8) To be able to put images at proper points on chart
	9) To be able to save work page

When tables are examined, it is seen that a rubric of 41 articles was prepared for 4 performance questions involved in the test. The highest point to get in TPUSSP is 82 when all drawings are completed accurately. When it is examined according to sub-dimensions formed by four performance questions in the test, the highest scores to take are 24 for table, 16 for pie chart, 24 for column chart and 18 for line chart creating.

Reliability is the indicator whether or not measurements obtained by the assessment instrument applied on a particular population or sample are consistent and whether or not similar results are obtained when assessment instrument is applied again (Bademci, 2006). Cronbach Alpha coefficient was calculated as $\alpha=0.74$ according to reliability analysis conducted at the end on the data obtained from TPUSSP. As reliability is sample dependent dissimilar reliability values can be obtained when this assessment instrument is applied on different groups. It is safe to argue that reliability value which is calculated according to data obtained from population is accurate.

Results

Descriptive statistics of teacher candidates in performance test are presented on Table 5.

Table 5. Success Levels by Sub-Dimensions in TPUSSP

Performance questions	$\bar{X}$	s	Success level (%)
Creating table	11.4	8.1	47
Creating pie chart	12.7	1.7	80
Creating column chart	16.0	4.3	67
Creating line chart	14.0	3.1	78
Sum	54.1	12.4	66

As seen in Table 5, average of total points in TPUSSP is $\bar{X}=54.1$ and standard deviation is $s=12.4$. General success levels of teacher candidates are 66 % in TPUSSP. When sub-dimensions of the test are examined, it is seen that teacher candidates showed success level at 47 % in “creating table”, 80 % in “creating pie chart”, 67 % in “creating column chart” and 78 % in “creating line chart” performance questions. It is evidenced that preservice teachers got the lowest score in creating table and the highest performances were in creating pie chart and line chart.

Table 6 presents the results of independent samples for t-test conducted so as to determine if there is a significant relation between total points of teacher candidates in TPUSSP and certain demographic features of teacher candidates (gender, having a personal computer or not and having a training for computer or not).

Table 6. T-test Results on TPUSSP according to Certain Demographic Features

Certain demographic features		N	$\bar{X}$	s	Sd	t	p
Gender	Female	43	56.56	11.46	52	3.05	.004*
	Male	11	44.64	12.02			
Creating table	Female	43	12.77	7.92	52	2.64	.011*
	Male	11	5.91	6.66			
Creating pie chart	Female	43	12.98	1.60	52	2.21	.031*
	Male	11	11.73	1.95			
Creating column chart	Female	43	16.56	3.84	52	1.92	.060
	Male	11	13.82	5.53			
Creating line chart	Female	43	14.26	3.19	52	1.02	.314
	Male	11	13.18	2.86			
Having a personal computer or not	Yes	49	54.00	12.72	52	-.238	.813
	No	5	55.40	10.31			
Having a training for computer or not	Yes	38	54.08	12.56	52	-.046	.964
	No	16	54.25	12.56			

*p<.05

When Table 6 is examined, there is a significant difference between mean scores of female and male preservice teachers in TPUSSP $t_{(52)}=3.05$; $p=.004$; $p<.05$. Mean score of females $\bar{X}=56.56$ is higher than mean score of males $\bar{X}=44.64$. Gender difference has an effect on the mean scores obtained in TPUSSP. Effect size is calculated as $\mu^2=.1517$ at the end of analysis conducted to determine to what

extent gender is a determinant over scores they got in TPUSSP. Accordingly 15.17 % of the scores in TPUSSP can be explained by gender difference.

When achievement level at sub-dimensions of performance test is examined in terms of gender, there is a significant difference between mean scores of female and male preservice teachers in "creating table" $t_{(52)}=2.64$; $p=.011$; $p<.05$. Mean score of males $\bar{X}=5.91$ is lower than average of females $\bar{X}=12.77$. Gender difference has an influence on the mean scores in performance based question like "creating table". Effect size is computed as $\mu^2=.1180$ at the end of analysis conducted to determine to what extent gender is a determinant over scores they got in performance question "creating table". Accordingly 11.80 % of the scores in performance question "creating table" can be explained by gender.

When achievement level at sub-dimensions of performance test is examined in terms of gender, there is a significant difference between mean scores of female and male preservice teachers in "creating pie chart" $t_{(52)}=2.21$; $p=.031$; $p<.05$. Mean score of males $\bar{X}=11.73$ is lower than average of females $\bar{X}=12.98$. Gender difference has an effect on the mean scores in performance question "creating pie chart". Effect size is computed as $\mu^2=.086$ at the end of analysis conducted to determine to what extent gender is a determinant over scores they got in performance question "creating pie chart". Accordingly 8.6% of the scores in performance question "creating pie chart" can be explained by gender.

There is not any significant difference between mean scores of females and males preservice teachers in "creating column chart" $t_{(52)}=1.92$; $p=.060$; $p>.05$. Mean score of males $\bar{X}=13.82$ is lower than that of females $\bar{X}=16.56$. However, this difference in between their mean scores is insignificant. Gender difference has no effect on the scores in performance question "creating column chart".

There is no significant difference between mean scores of females and males preservice teachers in "creating line chart" $t_{(52)}=1.02$; $p=.314$; $p>.05$. Mean score of males $\bar{X}=13.18$ is lower than mean score of females $\bar{X}=14.26$. However, this difference between their mean scores is insignificant. Gender difference has no effect on the scores in performance question "creating line chart".

There is not any significant difference between the condition whether preservice teachers have personal computers or not and mean scores they got in TPUSSP $t_{(52)}=-.238$; $p=.813$; $p>.05$. Mean score of those who have personal computers $\bar{X}=54.00$ is lower than the mean score of those who do not have personal computers $\bar{X}=55.40$, but this difference between mean scores is not significant. For this reason, not any further analysis was initiated on the relation between achievement level at sub-dimensions of performance test and whether or not preservice teachers have personal computers.

Likewise, there is no significant difference between the condition whether or not preservice teachers have training for computer and point averages they got in TPUSSP $t_{(52)}=-.046$; $p=.964$; $p>.05$. Mean score of those who have computer training $\bar{X}=54.08$ is almost equal to the mean scores of those who had no computer training $\bar{X}=54.25$ and there is no significant difference between their mean scores. For this reason, not any further analysis was initiated on the relation between achievement level at sub-dimensions of performance test and whether or not preservice teachers had computer training.

Conclusions and Discussion

It was evidenced that 90 % of preservice teachers participated in this study have personal computers and 70 % of them attended a training on computer. Besides, it can be stated that in terms of their general performance preservice teachers are at an average level (66 %). It is seen that preservice teachers achieved the lowest performance in creating table and the highest performance in creating pie chart and line chart.

It is thus construed that there is a significant difference between total scores in TPUSSP and gender of preservice teachers. It is determined that females are more successful compared to males in

drawing in TPUSSP. However, number of males is lower than number of females in the study conducted. For this reason, it is required to take this inequality into consideration while the result is interpreted. This research can be implemented by taking the same number of males and females preservice teachers into the scope of analysis.

According to the results of correlation analysis conducted to determine the relation between scores which preservice teachers got in TPUSSP and also gender of preservice teachers, there is a significant difference between females and males in terms of performance based questions like “creating table” and “creating pie chart”. There is not any significant difference between females and males in terms of performance questions which cover “creating column chart” and “creating line chart”.

When relevant literature is examined, a number of studies revealed that male teachers are more willing to use technology according to a research conducted regarding technology use among teachers (Vural, 2004). As a result of the study conducted by Akkoyunlu and Orhan (2003), a significant difference was measured in favor of males as regards high level of computer skills while no significant difference is found between female and male students in terms of computer use self-efficacy beliefs and basic computer skills. This difference may be linked with the format of measurement tool used in determining the perceptions against computer skills and technologies in the researches conducted. Performance measurement intended to measure knowledge and skills collectively has been performed in this study while Likert scales are used in other researches. Buabeng Andoh and Totimeh (2012), in their study in which they have analysed use of computer technologies by secondary school teachers in their classes, demonstrated that male teachers access to the computers more than female teachers. In the study carried out by Kahveci et al. (2011) it has been determined that having a personal computer is an important factor in terms of computer experience and training.

According to results of independent samples t-test conducted to determine if there is a significant relation between total scores of preservice teachers in TPUSSP and demographic features of preservice teachers, it is seen that there is not any significant difference between the condition in which preservice teachers have a personal computer or not and mean scores obtained in TPUSSP. It is seen that there is not any significant difference between the condition in which preservice teachers had training for computer and mean scores they obtained in TPUSSP. Scores in TPUSSP manifested not a significant difference in terms of demographic features, and it indicates that conditions in which teachers have had a computer course or had personal computers are not sufficient to improve abilities to use the mentioned applications according to course purposes and requirements. It is thus required to determine how these applications are used in both computer teaching and the relevant courses within science curriculum and to improve knowledge and skills in this way.

Further studies can be conducted on how drawing skills change before and after computer class or how table drawing performance can improve. By negotiating with computer instructors they can be informed about the incompetency of preservice teachers and they can be supported to focus more on the kind of performance skills that preservice teachers would often use in line with the purpose of their course.

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