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Changes in Turkish Pre-Service Elementary Teachers' Personal Science Teaching Efficacy Beliefs and Science Anxieties during a Science Method Course

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ABSTRACT

This study examines the changes in Turkish pre-service elementary teachers' personal science teaching efficacy (PSTE) beliefs and science anxieties (SANX) during a science methods course. Although a noticeable, but statistically insignificant, decrease in SANX scores was found, participants' PSTE scores did not increase during the semester. Interestingly instead, a slight decline was observed in PSTE scores. No significant gender effect on PSTE and SANX scores was detected. Unlike the relevant data from other countries, Turkish female pre-service elementary teachers were found to have lower SANX and higher PSTE scores than their male peers. Based on the data, while the methods course helped participants slightly reduce their anxieties toward science, around one-third of them expressed that they did not have adequate pedagogical knowledge to teach science effectively in elementary schools. Possible improvements in Turkish elementary teacher education programs are discussed in light of the related literature.

Keywords: Science Teaching Self-efficacy; Science Anxiety; Science Methods Course; Pre-service Elementary Teacher.

INTRODUCTION

Just three decades ago, Bandura (1977) introduced the term self-efficacy to educational literature with his social cognitive theory. His main assertion was the interplay between the behavior, personal factors, and environmental factors. Bandura used the concept of reciprocal determinism to explain that each of the three factors influences and is also influenced by the others. Therefore, the personal factors in the cognitive, affective, and biological forms should not be ignored when investigating the human behavior. Self-efficacy represents the belief that

an individual possesses and defined as "the beliefs in one's capability to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3).

Bandura's new theory was welcomed in research in teaching and Ashton and Webb (1986) defined two types of teaching efficacy [personal teaching efficacy and outcome teaching efficacy] along with the definitions of Bandura. Personal teaching efficacy – or teaching self-efficacy – beliefs indicates a teacher's confidence in his/her own training or experience to develop strategies for overcoming obstacles to student learning. Bandura (1977) hypothesized that "Efficacy expectation is a major determinant of people's choice of activities, how much effort they will expend, and how long they will sustain effort in dealing with stressful situations" (p. 194). Outcome teaching efficacy beliefs, on the other hand, indicates the expected outcomes of teacher actions, and therefore they are beyond an individual teacher's view of his or her personal capabilities.

Since the efficacy beliefs are accepted to be context and subject matter dependent, definitions have been extended to specific subject areas. In the area of science teaching, two forms of efficacy beliefs are defined: personal science teaching efficacy (PSTE) and science teaching outcome expectancy (STOE). PSTE – or science teaching self-efficacy – is a person's belief in his or her ability to teach science effectively and STOE is the belief that effective teaching will have a positive effect on student science learning. As Ashton and Webb (1986) described, PSTE and STOE operate independently, therefore it is possible to see teachers with high PSTE but low STOE or vice versa (Cantrell, Young, & Moore, 2003; Moore & Watson, 1999).

Since the introduction of the concept of self-efficacy to the literature, there has been a growing interest to discover the impact of self-efficacy beliefs in science education. The case is in utmost importance in elementary education because elementary teachers are expected to teach all subjects in their classrooms, but it is highly that they are equally well prepared to teach all of those subjects. It has been repeatedly cited that elementary teachers' negative beliefs about science had resulted in a science anxiety, poor attitudes toward science, and in an unwillingness or hesitancy to spend time for teaching science (Ramey-Gassert & Schroyer, 1992). Similarly, many teachers are reported to dislike, fear, and fail to understand science (Feistritzer & Boyer, 1983). These findings lead to the conclusion that some elementary teachers' negative attitudes toward science negatively affect their science teaching self-efficacy beliefs, which eventually leads to ineffective science instruction.

Low self-efficacious teachers are cited to rely on the overly use of teacher-directed instruction such as lecturing or text-based instruction and characterized by authoritative teacher-centered roles. Due to their low levels of confidence in their effectiveness, these teachers may avoid science experiments and other inquiry experiences to prevent any challenging outcomes. On the other hand, there is ample evidence stating that high self-efficacious teachers use more inquiry and student-centered teaching strategies. These teachers feel confident that they have adequate training or experience to implement teaching strategies for overcoming the barriers to student learning. High-efficacious teachers found to be more effective and more likely to spend the time needed to develop science concepts and also their students had more positive attitudes toward science and achieved higher on achievement tests (Cantrell et al., 2003; Ramey-Gassert & Schroyer, 1992; Riggs, 1991).

An interesting finding reported in relevant studies is the gender impact on teachers' self-efficacy beliefs. Riggs (1991) reported that male elementary teachers experience higher self-efficacy for teaching science than female teachers in both inservice and preservice situations. Also, Brownlow, Jacobi, and Rogers (2000) concluded that "Regardless of their actual science

performance, women are much less self-confident in their capabilities with science and report much more science anxiety than do men" (p. 120). Unlike the studies conducted in other countries, Turkish researchers have found that female Turkish preservice elementary teachers have slightly higher PSTE beliefs than their male peers, but the difference was reported to be statistically insignificant (Cakiroglu, Cakiroglu, & Boone, 2005; Gencer & Cakiroglu, 2007).

Science anxiety has been defined as a fear of aversion toward science concepts, scientists, and science related activities (Mallow, 1981). Compared to the growing body of research on anxiety, it is interesting to note that there is few research on science anxiety. In one of the pioneer studies, Westerback and Long (1990) stated that they could not locate any published study in which science anxiety was considered a separate phenomenon and measured. Likewise, prior to this study, no research study was found where Turkish preservice elementary teachers' science anxiety levels were investigated. Recently, more researchers have become interested in investigating this phenomenon, and science anxiety is viewed as a composition of different forms of anxieties, such as classroom anxiety, test anxiety, performance anxiety, and anxieties toward other content areas, like reading anxiety and math anxiety (Wynstra & Cummings, 1993).

Science methods courses in teacher preparation programs are likely the last opportunity for future elementary teachers to develop teaching strategies, potentially gain positive attitudes toward science and teaching, and also overcome their anxieties toward science before starting their student teaching experiences. Nevertheless, limited student teaching experiences required by Turkish teacher education programs enhances the burden and importance of science methods courses. For these reasons, the main task of Turkish teacher educators should be designing science methods courses that will be beneficial to pre-service teachers in these aspects.

The findings of the previous research about the impact of the science methods courses on pre-service teachers' self-efficacy levels indicate that these courses are likely to increase the teaching self-efficacy levels and decrease the anxieties of most of the prospective elementary teachers (Morrell & Carroll, 2003; Palmer, 2001; Stevens & Wenner 1996). While there is a growing interest in the effectiveness of teacher education programs in many countries, there is a lack of data about the Turkish pre-service elementary teachers in regard to impact of science methods courses on their beliefs about science teaching. Therefore, the major contribution of this study to the present literature is to provide data about the changes in pre-service Turkish teachers' science teaching self-efficacy and science anxiety during a methods course, and discuss possible changes in the format of these courses to improve the success of teacher education programs.

1. Elementary Teacher Preparation Program

Elementary school licensure programs in Turkish universities are four-year-long undergraduate programs and their common curriculum is designed by the Higher Education Counsel (Yüksek Öğretim Kurulu, YÖK). Turkish teacher candidates take introductory pedagogical and science content courses in their first two years, prior to taking the methods courses. The participants of this study had taken the following five science courses prior to this study: biology (3 credits), chemistry (3 credits), physics (3 credits), environmental science (2 credits) and science laboratory (2 credits).

Teaching methods courses in elementary reading and writing, science, mathematics, and social studies are offered in the third year of the program. The year after completing these

methods courses, Turkish pre-service teachers start their student teaching in their final year. Teaching practicum is a seminar course where students practice in schools and share their experiences in their university classroom. For a minimum of 12 weeks, Turkish pre-service teacher are required to attend elementary schools for one full day or two half days. Upon successful completion of the undergraduate program within eight semesters, Turkish pre-service teacher receive elementary school teaching licensure to teach at the 1-5 grades in all public and private elementary schools (YÖK, 1998).

2. Science Methods Course

The science methods course investigated in this study was the final one for teaching science. Further, it was designed in a way that students practiced the theoretical knowledge they learned in the previous science content and methods courses. The science methods course was a three-credit course and two-hour-long class sessions were held twice a week during the thirteen week semester. From the classroom observations, the instruction method was mostly teacher-centered and text-book based. The participants completed a science experiment every week, but they were required to follow the procedures that were given in the course textbook and confirm the results. Since micro teaching at elementary schools was not a requirement, the participants did not do any first-hand teaching experience during the semester as a course assignment. The participants were required to take a midterm and final exam to pass the science methods course and the exam questions required student knowledge about the science content of the activities.

The purpose of this study is to:

- Investigate the impact of a science methods course on personal science teaching efficacy (PSTE) beliefs of Turkish pre-service elementary teachers.
- Investigate the impact of a science teaching methods course on science anxieties (SANX) of Turkish pre-service elementary teachers.
- Investigate whether there is any gender effect on Turkish pre-service elementary teachers' personal science teaching efficacy (PSTE) beliefs.
- Investigate whether there is any gender effect on Turkish pre-service elementary teachers' science anxieties (SANX).

METHODOLOGY

a) Sample

The purposive sample of this study consisted of 154 junior Turkish elementary teacher candidates from three classrooms. The participants were enrolled in a science methods course at a mid-sized Anatolian University. The course was taught by the same instructor in the same building at different times of the week. The participants were in their third year of a four-year teacher education program; 87 of them were male, and 67 were female. Their ages were between 19 and 30 years, with a median age of 21. The data used in the paired-samples analysis was collected from 115 students (66 males and 49 females) who appeared in both the pretest and the posttest. Prior to the methods course, all participants had taken the previous licensure courses required by the teacher education program. In addition to the science

methods course, participants were also enrolled in elementary mathematics, social science, and reading methods courses during the research study.

b) Instruments and Data Analysis

The Science Teaching Efficacy Belief Instrument (STEBI-B) (Enochs & Riggs, 1990) and the Science Anxiety (SANX) survey were administered at the beginning and end of the science methods course as traditional pre- and post-test to measure the changes in participants' scores in those respective variables. To analyze the changes in participants' self-efficacy beliefs and anxiety levels during the science methods course period, paired-samples t tests were used to compare the pre- and post-test data.

The Science Teaching Efficacy Belief Instrument (STEBI-B) was developed by Enochs and Riggs in 1990, and it is a widely used instrument to assess self-efficacy beliefs of pre- and in-service teachers regarding science instruction in schools. The instrument consists of two subsets: personal science teaching efficacy (PSTE) and science teaching outcome expectancy (STOE). PSTE consists of 13 items and STOE consists of 10 items, each to be rated by the respondent on a one (strongly disagree) to five (strongly agree) rating scale. Personal science teaching efficacy beliefs refer to the extent that teachers believe they have the capacity to positively affect students' achievement. The internal reliability alpha coefficient of the PSTE scale of the STEBI-B was calculated to be .90 (Enochs & Riggs, 1990).

On the other hand, some researchers reported their reservations on the use of the STOE scale of the STEBI-B in today's classrooms. As Enochs and Riggs (1990) noted, outcome expectancy is a difficult construct to measure due to its complex nature. Research since the introduction of the STEBI often cites that the outcome expectancy construct is usually viewed inconsistently among preservice teachers, as opposed to the consistent results from the PSTE scale. Mullholland, Dorman, and Odgers (2004) argue that one of the reasons for the low reliability of the STOE scale in recent studies is the evolving view of teachers' roles in today's classrooms. According to them, the STOE items emphasize the teacher-centered approach, while student-centered teaching is highly encouraged in current teacher preparation programs. Mullholland et al. concludes that, "within this new mindset, teachers are learning facilitators and it is plausible that contemporary pre-service teachers cannot see the relevance of STOE items" (p. 327). Since the goal in this study is to investigate the changes in personal efficacy, only the PSTE scale of the STEBI-B instrument was administered in pre- and post-test.

The STEBI-B survey was translated into Turkish by the author and a Turkish doctoral student majoring in elementary science education at an American university. The factor analysis data showed that all items in the Turkish version of the STEBI-B provided higher contribution than .440 in the pretest and .308 in the posttest, but item 1 in the pretest which had a factor loading of .275. Since item 1 contributed at significant level in the posttest (factor loading = .308), it was kept in the analysis for the paired-samples comparison. The Cronbach's alpha reliability coefficient for the PSTE scale was found to be .89 for the pretest and .83 for the posttest data. These data show that Turkish version of the STEBI-B used in this study was a valid and reliable instrument to measure Turkish elementary pre-service teachers' science teaching self-efficacy beliefs. Detailed STEBI-B factor analysis results can be found in Appendix A.

The Science Anxiety (SANX) survey was designed by the author to measure pre-service teachers' science anxiety levels and contains 20 statements, each to be rated by the respondent on a one (no anxiety) to five (high anxiety) rating scale (Possible scores range from 20 to 100).

The statements describe everyday life and academic situations requiring scientific thought or tasks, and are rated as to the degree of anxiety that the respondent perceived he/she would experience in the given situations. Cronbach's alpha reliability coefficients of .91 were calculated for both the pre- and post-test SANX data. The factor analysis data showed that all items in the SANX survey contributed to the "science anxiety" factor. The cut-off point was selected .3, as traditionally accepted, and all items in pre- and post-tests provided higher contributions than .329 and .428 respectively. Therefore, this study also serves as the validation of the SANX survey for the Turkish pre-service elementary teacher population. A copy of the SANX survey and factor analysis results can be found in Appendixes B and C.

In addition to the surveys, a questionnaire was designed by the author, which consisted of two likert-scale questions. The questions investigated students' self-perceptions about their enjoyment level of studying in science and pedagogical knowledge level to teach science at elementary schools. The first question included a five-point rating scale of "very much dislike (1)" to "very much enjoy (5)" with a neutral option, and the second question included a four-point rating scale of "incompetent (1)" to "competent (4)".

c) Observation

During the science methods course semester, the researcher attended 60 two-hour class periods with the participants in three different classrooms. The researcher's role was the participant observer. Along with the notes from informal conversations, field notes were used to record the types of classroom activities, student participation, and the interactions between the instructor and the students. After every class period, field notes were reread and summarized into a one page summary. The observation data was compared with the quantitative findings to explain the pretest and posttest survey results.

FINDINGS

The summary of the participants' mean scores for the PSTE subset of the STEBI-B and SANX surveys are given in Table 1. The paired-samples test results indicate that the mean PSTE score of the participants slightly declined (ΔPSTE=-0.16; $p=.817$) during the science methods course. Also, a noticeable, but statistically insignificant (ΔSANX=-2.36: $p=.07$), decline in the mean SANX score was observed from pretest to posttest.

Table 1. *Participants' Pre- and Post-test PSTE and SANX Scores*

	PSTE		SANX	
	Mean	**S. D.**	**Mean**	**S. D.**
Pretest	49.23	7.44	49.42	13.69
Posttest	49.07	6.45	47.06	13.28

To investigate the changes in students' beliefs about each STEBI item, the percentages of participants who agreed/strongly agreed with the STEBI items are reported in Table 2. When reporting the percentages, the negative STEBI items are reworded as positive items and their percentages for the disagree/strongly disagree options are reported. Table 2 indicates that

at least 70% of the participants felt confident in ten of the STEBI statements, but at the same time, 43% of them still did not agree that they knew necessary steps to teach science effectively (Item 3), and one-third of them did not feel confident enough to be effective in monitoring science experiments (Item 4) at the end of the course. Also, about half of them expressed their unwillingness to be observed by a supervisor (Item 10). Since this course is the final science methods course in the program, based on the data, a significant portion of these pre-service teachers are likely to complete the methods courses without a desired level of self-efficacy. It is also equally disturbing that, compared to 76% agreement in item 2 of the pretest; a smaller percentage of the participants (70%) agreed that they will teach science as well as other subjects in the posttest.

Table 2.*Percentages of Participants Who Agreed With STEBI Items*

STEBI Items	Pretest (A/SA)	Posttest (A/SA)
1. Will find better ways to teach science.	82%	91%
2. Will teach science as well as other subjects. *	76%	70%
3. Knows the steps necessary to teach science effectively.	39%	57%
4. Will be effective in monitoring science experiments. *	70%	67%
5. Will teach science effectively. *	81%	80%
6. Understands science concepts well enough to be effective.	74%	77%
7. Will be able to explain why science experiments work. *	65%	72%
8. Will be able to answer student questions	75%	80%
9. Will have necessary skills to teach science. *	63%	70%
10. Willing to be observed by supervisor. *	60%	53%
11. Will be able to help students understand science concepts. *	79%	82%
12. Will welcome student questions.	94%	95%
13. Knows what to do to turn students on to science. *	74%	77%

A: Agree, SA: Strongly Agree
*: Denotes the negative item rewritten in positive form.

Table 3. *Pre- and Post-test PSTE and SANX Scores by Gender*

	Male		Female	
	Mean	**S. D.**	**Mean**	**S. D.**
Pre-PSTE	48.31	8.22	50.53	6.02
Post-PSTE	48.36	7.41	50.09	4.67
Pre-SANX	49.95	15.28	48.72	11.40
Post-SANX	48.07	13.64	45.72	12.81

Table 3 summarizes the PSTE and SANX score comparisons of the participants by gender. The mean scores from Table 3 indicate that Turkish female preservice elementary teachers in this sample had higher PSTE and lower SANX scores than their male peers in both the pretest and the posttest, but neither of the differences was statistically significantly at .05 alpha level.

To investigate the participants' self-perceptions about their enjoyment in studying science and pedagogical knowledge level to teach science, their responses to the questionnaire are summarized in Table 4. As seen in Table 4, consistent with the STEBI percentages, one-fourth of the sample indicated that they disliked studying science and one-third felt incompetent about their pedagogical knowledge level. Also, consistent with the mean SANX scores comparisons by gender; more males were found to dislike studying in science than the females in this sample. Furthermore, consistent with the mean PSTE scores analysis by gender, females tended to express more confidence in their pedagogical competence than the males in the sample.

Table 4. *Participants' Self-Perceptions about Their Attitudes toward Science and Pedagogical Knowledge Levels*

	Female	Male	Total
Attitude toward science*			
Dislike/Very Much Dislike	20%	27%	25%
Enjoy/Very Much Enjoy	57%	52%	54%
Pedagogical knowledge level to teach science			
Incompetent/Somewhat Incompetent	29%	36%	33%
Somewhat Competent/ Competent	71%	64%	67%

* The percentages for the neutral option are not reported.

DISCUSSION AND CONCLUSIONS

The data from this study indicates that, although there has been a noticeable, but not statistically significant, decline in participants' science anxieties during the science methods course, their PSTE scores did not increase as expected, but slightly decreased. These results show that the science methods course investigated in this study helped participants somewhat reduce their science anxieties that had been formed in previous science content courses; however, the course did not have a similar positive impact on participants' beliefs about their personal science teaching skills. Another disturbing result of this study for the Turkish teacher educators was finding that a significant number of Turkish pre-service elementary teachers in this study lacked enjoyment in studying science and expressed their lack of pedagogical knowledge to teach science, even after completing a science methods course.

Consistent with the few other studies conducted in Turkey (e.g. Gencer & Cakiroglu, 2007) and unlike the case in many countries (Brownlow et al., 2000; Riggs, 1991), gender effect was not found a significant factor in Turkish pre-service elementary teachers' science anxiety or science teaching self-efficacy levels. Although the differences were not statistically significant, quite contrary to the findings from other countries, Turkish female pre-service elementary teacher were found to have slightly higher science teaching self-efficacy levels and

lower science anxieties than their male peers. These results indicate that further research is needed to investigate the possible factors that positively impact Turkish pre-service female elementary teachers compared to their male peers.

In light of the related literature, a major factor impacting pre-service teachers' lack of self-efficacy to teach science would be the format of the previous science content courses they had taken and the science methods course investigated in this study. It is a common problem reported in the literature that preservice teachers in all over the world develop anxieties toward science in science content courses (Morrell & Carroll, 2003; Palmer, 2006; Stevens & Wenner 1996), which are usually taught by professors from natural science departments. Furthermore, since changing beliefs requires time (Pajares, 1992), the limited student teaching experiences of Turkish pre-service teachers do not provide enough opportunities to them for developing strong science teaching self-efficacy beliefs. For these reasons, it is almost the case that science methods courses are the only option left for Turkish teacher educators to help their students overcome the negative attitudes toward science. A science methods course consisting of science experiments, as in this study, is likely to help pre-service teachers reduce their anxiety toward science, but this does not mean that pre-service teachers will improve their self-efficacy beliefs through the same activities. From the classroom observations and informal conversations, participants have considered the content of methods course easier than the previous science courses, and therefore improved their attitudes toward science; however, it can be concluded that a teacher-centered science methods course without actual student teaching experiences is unlikely to enhance pre-service teachers' self-efficacy beliefs to teach science.

To be able to prepare more self-efficacious elementary teachers, Turkish teacher educators should consider the factors that are reported in the literature as enhancing pre-service teachers' self-efficacy beliefs. For example, the use of hands-on science inquiry activities (Bleicher, 2006; Cox & Carpenter, 1989; Mullholland & Wallace, 1996) and student teaching experiences at elementary schools (Cantrell et al. 2003; Huinker & Madison, 1997; Palmer, 2006) are likely to improve students' attitudes toward science and science teaching. Science experiments are strongly recommended not to emphasize the science content knowledge, be appropriate to the elementary school level, and relate to everyday life (Cox & Carpenter, 1989). Foremost, students should be having fun during these activities (Palmer, 2001).

Due to the nonrandom sampling method used in this study, the results may not be generalizable to the whole Turkish pre-service elementary teachers population, but since student teaching in elementary schools is not a part of the science methods courses in all Turkish universities, the suggestions for the improvement of the science methods course investigated in this study would certainly apply to most teacher education programs around the country. Based on the findings from this study and the previous research, Turkish teacher educators should consider enhancing the effectiveness of science methods courses by:

- Incorporating student teaching activities at elementary schools into science methods courses.
- Employing more hands-on science inquiry activities – activities relevant to everyday life and can be used directly in elementary classrooms – via student-centered teaching methods.

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APPENDIX A

Validity Analysis for the Turkish Version of the STEBI-B PSTE Scale

PRETEST		**POSTTEST**	
STEBI Item	**Factor Loading**	**STEBI Item**	**Factor Loading**
Item 9	,738	Item 5	,766
Item 7	,737	Item 11	,738
Item 11	,730	Item 9	,585
Item 2	,711	Item 10	,572
Item 10	,671	Item 6	,557
Item 5	,662	Item 7	,532
Item 4	,657	Item 13	,515
Item 8	,641	Item 12	,515
Item 3	,623	Item 2	,460
Item 13	,550	Item 8	,429
Item 6	,522	Item 3	,407
Item 12	,440	Item 4	,393
Item 1	,275	Item 1	,308

APPENDIX B

Science Anxiety Survey

Some of the following activities may cause anxiety toward science and science learning.
Please select one of the boxes to indicate the level of anxiety you may or may not experience in each situation.

	None	Some	Moderate	Much	Very Much
1. Discussing scientific theories with my friends outside school	☐	☐	☐	☐	☐
2. Explaining my ideas to people about a novel event in nature	☐	☐	☐	☐	☐
3. Being asked to justify an everyday life decision by using science	☐	☐	☐	☐	☐
4. Helping an elementary student with his/her science project	☐	☐	☐	☐	☐
5. Walking to a science class	☐	☐	☐	☐	☐
6. Working on a project for my science class	☐	☐	☐	☐	☐
7. Waiting for the result of a science exam	☐	☐	☐	☐	☐
8. Reading science textbooks	☐	☐	☐	☐	☐
9. Reporting scientific data from tables and charts in class	☐	☐	☐	☐	☐
10. Doing a science experiment in lab	☐	☐	☐	☐	☐
11. Presenting my findings from science experiments to the teacher	☐	☐	☐	☐	☐
12. Taking a science exam	☐	☐	☐	☐	☐
13. Being asked to justify my answer in a science class	☐	☐	☐	☐	☐
14. Asking questions about what I do not understand in a science class	☐	☐	☐	☐	☐
15. Thinking about an abstract scientific concept in class	☐	☐	☐	☐	☐
16. Being asked by my teacher to explain a novel event	☐	☐	☐	☐	☐
17. Using units in science classes	☐	☐	☐	☐	☐
18. Using mathematical equations in science exams	☐	☐	☐	☐	☐
19. Recalling the textbook definition of scientific laws	☐	☐	☐	☐	☐
20. Being asked to explain scientific laws in my own words	☐	☐	☐	☐	☐

Note: The Turkish version of the SANX survey can be requested from the author. (*mbursal@cumhuriyet.edu.tr*)

APPENDIX C

Science Anxiety (SANX) Survey Validity Analysis

PRETEST		POSTTEST	
SANX Item	**Factor Loading**	**SANX Item**	**Factor Loading**
Item 13	,787	Item 13	,757
Item 11	,739	Item 11	,746
Item 20	,681	Item 6	,689
Item 9	,679	Item 16	,677
Item 16	,663	Item 20	,652
Item 15	,645	Item 5	,651
Item 6	,637	Item 9	,641
Item 12	,636	Item 4	,613
Item 10	,629	Item 10	,611
Item 8	,614	Item 3	,597
Item 17	,609	Item 8	,595
Item 3	,593	Item 12	,594
Item 5	,588	Item 14	,572
Item 7	,569	Item 15	,539
Item 18	,540	Item 17	,536
Item 14	,540	Item 7	,529
Item 19	,484	Item 2	,515
Item 4	,463	Item 1	,472
Item 2	,394	Item 18	,465
Item 1	,329	Item 19	,428