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Although WJEIS is a new journal, it has been welcomed with interest. A lot of journals from various universities are in the evaluation process. We would like to thank cordially our colleagues who work hard in editorial board to evaluate the articles, writers who contribute to our journal and all readers.

1st November, 2017

Best regards

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IMPROVING READING COMPREHENSION LEVEL AND STRATEGY USE THROUGH STRATEGIES-BASED READING INSTRUCTION

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Abstract
The aim of this study is to find out the effects of strategies-based reading instruction on the students’ strategy use and reading comprehension level. The study which was conducted with a Solomon four groups experimental design also focused on the long-term impact of the instruction. English Reading Strategies Scale and Reading Comprehension Test were used as the instruments for gathering data. The sample consisted of 111 second class students enrolled in English class at a state college in Turkey. Fifty-seven students comprised the experimental group and fifty-four students served as the control group. Results gathered on the post tests revealed that strategies-based reading instruction increased the students’ strategy use and led to a statistically important improvement in their comprehension level compared with the control group. Also, results gathered on the delayed test revealed that impact of strategies-based reading instruction on the strategy use and comprehension level is maintained.

Keywords: Strategies-based reading instruction, English reading strategies, Solomon four groups experimental design.

INTRODUCTION
In learning a foreign language process, individual differences can become very important. Learning a foreign language may differ from acquiring the mother language in many ways. Generally people follow similar procedures while acquiring the mother language; however we cannot mention these similarities in learning a foreign language process especially if the learner is adult or older than a certain age. Some of these differences are the need and motivation for learning the language, learning styles that learners have in the process, strategies that are used consciously to facilitate learning, the experiences that the individuals have in the past, gender, and the sociocultural environment (Benson & Gao, 2008; Macaro, 2001).

Though using a strategy in the language learning process is not an individual difference like age, gender and motivation, using of different strategies by different students indicates a strong connection between strategy use and individual differences (Benson & Gao, 2008; Dörnyei, 2005). Learning strategies are steps taken by the learners to facilitate their own learning. Strategies are very significant in language learning because they contribute active self-oriented participation into the process which is necessary for developing communicative competence. Strategies which are used correctly and appropriately increase competence and self-confidence and will lead to more effective language acquisition (Rubin, 2001; Wong & Nunan, 2007; Macaro, 2001).

Language learning is generally considered as a secret process; so, many conscious activities that the learners perform during this process can be ignored. Language teachers may sometimes disregard learning strategies that learners use to comprehend a text, process new information and learn
structures of the language (Macaro, 2001). As a teacher, knowing, using and teaching language learning strategies can make a very important contribution to comprehensible language input.

Comprehensible input is the most important factor that influences language learning, especially at the beginning level. When intensive and comprehensible input is ignored and the effort is put into teaching only linguistic elements, the desired efficiency cannot be obtained. Comprehensible input revealed using authentic materials will contribute to development of reading and listening skills. In this process, knowing and using the reading strategies will be beneficial to language acquisition.

**Reading strategies**

Reading strategies may be defined as a conscious process that the reader follows to solve the problems he/she encounters while reading and enhance their comprehension of the text. Reading strategies:

- are conscious techniques and skills,
- are used to enhance reading comprehension,
- can be behavioral or mental (Pressley, 2006; Brantmeier, 2002).

Though readers use different strategies for different situations, summarizing, asking questions about the passage, answering the questions, collaboration, activation of the existing knowledge about the content, awareness of the text structure, using the visual clues given in the passage, making inference, making mental image, translation, restatement of the sentences, guessing, paraphrasing and note taking are the most commonly used reading strategies (Pressley, 2006; Brantmeier, 2002).

Reading strategies are divided into two main groups: cognitive reading strategies and metacognitive reading strategies. Cognitive strategies like guessing the unknown word from the context, asking questions, finding the main idea and skimming perform directly on the input to make it more comprehensible. On the other hand, metacognitive strategies are about self-awareness and awareness of the passage. Setting goals and objectives, self-monitoring, self-evaluation, self-awareness, organizing and using multiple strategies to enhance learning are some of the metacognitive reading strategies (Pressley, 2006; Brantmeier, 2002; Dörnyei, 2005).

Mokhtari and Sheorey (2002) divide the reading strategies into three sub-categories: global reading strategies, problem solving reading strategies and support reading strategies. Global reading strategies are related to the overall analysis of the text like guessing, evaluating and translating. Problem solving strategies are used to solve the problems which develop in understanding textual information like adjusting reading speed, reviewing the text, thinking about the text, paraphrasing, analyzing the information presented in the text, checking to see if the guesses about the text are right or wrong. Support strategies are functional strategies like taking notes while reading, reading aloud, using reference material, using tables, figure and pictures, underlying or circling information.

**Strategies-Based Reading Instruction**

Strategies-based instruction (SBI) is a student-centered approach and it consists of two main components: explicit and implicit instruction. In explicit instruction, students are taught when, how and why the strategies can be used directly in a separate or integrated sessions. Explicit strategy instruction essentially involves following steps: development of awareness, modeling, practice, evaluation of the strategies used and transferring to new tasks (Cohen, 1996; Chamot, 2004). One of the prominent features of SBI is that responsibility of learners increases when they move from one step to another. Also, according to the learners' knowledge and experience about the objective strategies teachers can adjust their time allocation and support that they give in each step (Nguyen & Gu).

Oxford et all. (2014) suggest many ways of strategy instructions to learners: direct strategy instruction, strategy instruction integrated into the lesson material, strategy instruction in the separate courses, strategy guidance woven into language textbooks and strategy guidance implicitly.
In the separate strategy instruction, teacher defines the target strategy, demonstrates its use as a model, asks students to give examples of their own learning experiences, guides the group or class discussion on the rationale behind the use and effectiveness of the strategy, and encourages students to use different strategies. Those who defend this instruction way argue that the target strategies are not specific to the subject and can be adapted to different topics. It's also more useful to focus on just the target strategy rather than focusing on both the subject and the strategy (Chamot & O'Malley, 1996; Cohen, 1996).

Another way of strategy training is to integrate the target strategies into the lesson materials. The teacher first determines the target strategies and then organizes activities within the course material to teach them. Those who defend this instruction way argue that learning in a context is more effective and permanent and it will be easier to transfer the strategies taught in an authentic linguistic content to the similar topics (Grabe, 2009; Macaro, 2001; Chamot & O'Malley, 1996; Cohen, 1996; Donsereau, 1985).

Many researchers agree on the importance of explicit instruction in strategy training. However, there is less agreement on the issue of whether strategies instruction should be integrated into the language curriculum or taught separately (Chamot, 2004; Oxford & Leaver, 1996).

Strategy training shouldn't be postponed until advanced level, because at the beginning level, students also need learning strategies to enhance their learning. Most probably, during the strategy instruction it will be inevitable to use first language for beginning level (Macaro, 2001; Wenden, 2002; Oxford et al., 2014). The main objective of the strategy training is to help students use the strategies consciously at first, and then gain autonomy (Anderson, 2005). The goal of this kind of instruction is to help the learners (Gascoigne, 2005):
- become more aware about how they learn more effectively,
- realize the ways in which they enhance their own learning,
- become more responsible for their own learning process,
- become more effective learners by individualizing the process.

In this study, the objective reading strategies are integrated with the reading activities and each session is designed according to the following O'Malley's strategies-based instruction procedures.

Table 1: Structure of a Strategies-Based Reading Instruction (SBRI) Session

<table>
<thead>
<tr>
<th>Preparation</th>
<th>Practice</th>
<th>Evaluation</th>
<th>Expanding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation</td>
<td>Group discussion</td>
<td>Discussion of the objective strategy in the classroom</td>
<td>Similar tasks for the assignment</td>
</tr>
<tr>
<td></td>
<td>Modeling the objective strategy</td>
<td>Evaluating the effectiveness of the strategy</td>
<td>Following session</td>
</tr>
</tbody>
</table>

There are some intervention studies to confirm the effect of strategy training on reading performance and strategy use. For example, Gürses (2011) carried out a study in which she tried to find out the effect of the reading strategy instruction based on Cognitive Academic Language Learning Approach on the reading comprehension level and strategy use. Results of this study, which was designed as an action research, showed that strategies-based reading instruction affect the learners’ comprehension level and strategy use in a positive way.

In an intervention study which was designed to ascertain the effect of the separate strategy instruction on reading comprehension achievement Aghaie and Zang (2012) revealed that strategy
Instruction increased the learners’ strategy use and autonomy significantly in acquiring reading skills. Also, Takallou (2011) and Whichadee (2011) came up with the similar result from their studies that strategies-based reading instruction increased the strategy use (especially the metacognitive ones) and significantly contributed to the learners’ reading comprehension level.

In this section, we have reviewed what the literature has said on the strategies-based reading instruction and we found out the following highlights.

- Strategies-based reading instruction increases the students’ strategy use (Kashef, Pandian & Khameneh, 2014; Takallou, 2011; Gürses, 2011; Razi, 2010).

The aim of this study is to find out the effects of strategies-based reading instruction which is integrated into the lesson material on strategy use, gaining autonomy and reading comprehension level.

**Hypothesis of the Research**

H1: Strategies-based reading instruction increases students’ strategy use.

  a: Strategies-based reading instruction increases students’ global reading strategies use.
  b: Strategies-based reading instruction increases students’ problem solving strategies use.
  c: Strategies-based reading instruction increases students’ support reading strategies use.

H2: Strategies-based reading instruction increases students’ reading comprehension level.

**METHODOLOGY**

**Research Design**

This study was designed as an experimental research and the Solomon four groups experimental design was used as the pattern. In Solomon four groups design, the subjects are assigned to two experimental and two control groups randomly. One of the experimental and one of the control groups are pretested on the dependent variable. The next step is to administer the intervention to the experimental groups but not to the control groups. Lastly, each group is posttested on the dependent variable (Kirk, 2009). The aim of the Solomon four groups experimental design is to control the effect of the pretest on the dependent variable. Posttests results of the experimental and control groups are compared. If two experimental groups have the similar results, and the two control groups have the similar results, it means that pretest doesn’t have any effect on the dependent variable. However, if two pretested groups’ results are different from the others, it means that pretest has an effect on the dependent variable (Neuman, 2006).

**Research Sample**

The sample consisted of beginner level 111 second class students enrolled in English class at a state college in Turkey. Fifty-seven students from this group comprised the experimental group and received strategies-based reading instruction for twelve weeks. Fifty-four students served as the control group. The objective reading strategies were incorporated into the regular classroom learning activities as the two sessions for each week.

<table>
<thead>
<tr>
<th>Table 2: Characteristics of Research Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Exper. Group 1</td>
</tr>
<tr>
<td>Exper. Group 2</td>
</tr>
<tr>
<td>Control Group 1</td>
</tr>
<tr>
<td>Control Group 2</td>
</tr>
</tbody>
</table>
Instruments

English Reading Strategies Scale: English Reading Strategies Scale (Mokhtari, & Sheorey, 2002) is a 5-point Likert type reading strategies scale with 30 items. The scale contains three dimensions, namely: (i) global reading strategies, (ii) problem solving reading strategies and, (iii) support reading strategies. Its structural validity was analyzed in 120 students via main component analysis, and factor loads varied between .54 and .74. The Cronbach Alpha internal validity coefficients of the three dimensions varied between .72 and .77.

Reading Comprehension Test: The test is one of the parts of the proficiency test used by Oxford University Press. It is a multiple-choice achievement test with 20 questions about 8 different reading texts. Its structural validity was analyzed in 230 students via test and item analysis. The differentiation of the items varied between .35 and .58, and item difficulties are between .32 and .55. The KR-20 validity of the test is found to be .86.

Procedure

During the first stage of the study, the teachers who would instruct the reading strategies-based reading program were trained about the program and reading strategies for six sessions. After the teacher training program, the pilot version of the program was applied for four weeks in a group which was equivalent in feature to the research sample. Then, English Reading Strategies Scale and Reading Comprehension Test were applied to one of the experimental and control groups as a pretest. Table 3 displays the results of the independent t-test which was used to see if there was a difference between the experimental and control group in terms of the English Reading Strategies Scale and Reading Comprehension Test. According to the results, there wasn’t any significant difference between the experimental and control groups (\(p > .05\)). Therefore, it could be deduced from this result that experimental and control groups were similar in terms of pretests scores.

Table 3: T-test Results of English Reading Strategies Scale and Reading Comprehension Test Means of Experimental and Control Groups

<table>
<thead>
<tr>
<th>Factors</th>
<th>Group</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Reading Strategies</td>
<td>Experimental</td>
<td>27</td>
<td>41.66</td>
<td>8.09</td>
<td>.182</td>
<td>.856</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>24</td>
<td>41.25</td>
<td>8.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Solving Reading Strategies</td>
<td>Experimental</td>
<td>27</td>
<td>29.88</td>
<td>5.94</td>
<td>1.22</td>
<td>.227</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>24</td>
<td>27.87</td>
<td>5.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support Reading Strategies</td>
<td>Experimental</td>
<td>27</td>
<td>5.73</td>
<td>5.73</td>
<td>.821</td>
<td>.417</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>24</td>
<td>5.98</td>
<td>5.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Strategies (Total)</td>
<td>Experimental</td>
<td>27</td>
<td>96.33</td>
<td>18.34</td>
<td>.211</td>
<td>.833</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>24</td>
<td>95.25</td>
<td>18.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Comprehension Test</td>
<td>Experimental</td>
<td>27</td>
<td>26.66</td>
<td>10.53</td>
<td>.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>24</td>
<td>26.66</td>
<td>9.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DF=49

After the application of the pretest, the instruction of the objective reading strategies to the experimental groups began. The strategies were integrated with the 12 reading texts of the book “More True Stories” and each session is designed according to O’Malley’s strategies-based instruction procedures: preparation, presentation, practice, evaluation and expanding. The experimental part of the study continued for 12 weeks, 2 hours per week. In each two-hour period one of the reading texts was taught. Summarizing, asking questions about the passage, answering the questions, collaboration, activation of the existing knowledge about the content, awareness of the text structure, using the visual clues given in the passage, making inference, making mental image, translation,
After the two-week period, English Reading Strategies Scale and Reading Comprehension Test were applied to two experimental and control groups as the posttests. The experimental process was completed by applying retention tests to all groups two months after the instruction period. An analysis of covariance (ANCOVA) was used to analyze the data gathered from posttests and retention tests scores. In order to prevent the effect of the pretests on the posttests and retention tests, the significance of the differences between the means of two experimental and two control groups’ posttests and retention tests scores were adjusted using the pretests results.

**FINDINGS**

**Findings About The Hypothesis 1: Strategies-Based Reading Instruction Increases Students’ Strategy Use.**

**Findings About Posttests Scores**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Eta-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>Model</td>
<td>3258.527</td>
<td>2</td>
<td>1629.264</td>
<td>52.40</td>
<td>.000</td>
<td>.63</td>
</tr>
<tr>
<td>Reading</td>
<td>Group</td>
<td>3249.602</td>
<td>1</td>
<td>3249.602</td>
<td>104.51</td>
<td>.000</td>
<td>.63</td>
</tr>
<tr>
<td>Strategies</td>
<td>Error</td>
<td>1492.453</td>
<td>48</td>
<td>31.093</td>
<td>50.80</td>
<td>.076</td>
<td>.62</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4750.980</td>
<td>50</td>
<td>95.039</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Problem     | Model   | 1551.088       | 2  | 775.544     | 42.167 | .000 | .63         |
| Solving     | Pretest | 72.629         | 1  | 72.629      | 3.949  | .053 | .076        |
| Reading     | Group   | 1485.403       | 1  | 1485.403    | 80.762 | .000 | .62         |
| Strategies  | Error   | 882.834        | 48 | 18.392      | 42.89  | .076 | .61         |
| Total       |         | 2433.922       | 50 | 48.719      |       |      |             |

| Support     | Model   | 1442.214       | 2  | 721.107     | 39.043 | .000 | .62         |
| Reading     | Pretest | 2.835          | 1  | 2.835       | .153   | .976 | .003        |
| Strategies  | Group   | 1410.971       | 1  | 1410.971    | 76.395 | .000 | .61         |
| Error       |         | 886.531        | 48 | 18.469      | 42.89  | .076 | .61         |
| Total       |         | 2328.745       | 50 | 48.719      |       |      |             |

In Table 4, the results of the covariance analysis for Reading Strategies Scale posttest scores which were adjusted according to the pretest scores were displayed. There was a statistically significant difference in reading strategies mean scores of the experimental and control groups in favor of the experimental group after adjusting for pretest differences between groups. This difference supports hypothesis H1, H1a, H1b and H1c. These results show that strategies-based reading instruction increases the students’ global reading strategies use, problem solving reading strategies use, support reading strategies use and as a whole reading strategies use. The strength of the relationship assessed with Eta-square was moderately strong with the treatment variable accounting for 70% of the variance in total reading strategies use, %61 of the variance in support reading strategies use, %62 of the variance in problem solving reading strategies use and % 63 of the variance in global reading strategies use.
Findings About Retention Test Scores

In Table 5, the results of the covariance analysis for Reading Strategies Scale retention test scores which were adjusted according to the pretest scores were displayed. There was a statically significant difference in reading strategies mean scores of the experimental and control groups in favor of the experimental group after adjusting for pretest differences between groups. This difference supports hypothesis H1, H1a, H1b and H1c. These results show that strategies-based reading instruction increases the students’ global reading strategies use, problem solving reading strategies use, support reading strategies use and as a whole reading strategies use. The strength of the relationship assessed with Eta-square was moderately strong with the treatment variable accounting for 78% of the variance in total reading strategies use, % 64 of the variance in support reading strategies use, %64 of the variance in problem solving reading strategies use and %67 of the variance in global reading strategies use.

Table 5: The Results of the Covariance Analysis for the Reading Strategies Scale Retention Test Mean Scores, Adjusted According to the Pretest Scores

<table>
<thead>
<tr>
<th>Scale</th>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Eta-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Pretest</td>
<td>.017</td>
<td>.017</td>
<td>1</td>
<td>.017</td>
<td>.001</td>
<td>.979</td>
<td>.000</td>
</tr>
<tr>
<td>Reading Group</td>
<td>2451.938</td>
<td>2451.938</td>
<td>1</td>
<td>98.639</td>
<td>.000</td>
<td>.67</td>
<td></td>
</tr>
<tr>
<td>Strategies</td>
<td>1193.168</td>
<td>24.858</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>95897.000</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Group</td>
<td>43.663</td>
<td>43.663</td>
<td>1</td>
<td>3.461</td>
<td>.069</td>
<td>.067</td>
<td></td>
</tr>
<tr>
<td>Solving Group</td>
<td>1089.571</td>
<td>1089.571</td>
<td>1</td>
<td>86.371</td>
<td>.000</td>
<td>.64</td>
<td></td>
</tr>
<tr>
<td>Reading Error</td>
<td>605.522</td>
<td>12.615</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategies</td>
<td>1734.157</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1822.745</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support Group</td>
<td>3.801</td>
<td>3.801</td>
<td>1</td>
<td>.284</td>
<td>.597</td>
<td>.006</td>
<td></td>
</tr>
<tr>
<td>Reading Group</td>
<td>1158.293</td>
<td>1158.293</td>
<td>1</td>
<td>86.467</td>
<td>.000</td>
<td>.64</td>
<td></td>
</tr>
<tr>
<td>Strategies</td>
<td>642.995</td>
<td>13.396</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1822.745</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Group</td>
<td>17993.185</td>
<td>8996.593</td>
<td>2</td>
<td>86.607</td>
<td>.000</td>
<td>.78</td>
<td></td>
</tr>
<tr>
<td>(Total)</td>
<td>17993.119</td>
<td>173.118</td>
<td>1</td>
<td></td>
<td>.103</td>
<td>.750</td>
<td>.002</td>
</tr>
<tr>
<td>Error</td>
<td>4986.148</td>
<td>103.878</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td>.78</td>
</tr>
<tr>
<td>Total</td>
<td>19421.176</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Findings about the Hypothesis 2: Strategies-based reading instruction increases students’ reading comprehension level.

Findings about posttests scores

Table 6: The Results of the Covariance Analysis for the Reading Comprehension Test Posttest Mean Scores, Adjusted According to the Pretest Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Eta-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>2103.890</td>
<td>2</td>
<td>1051.945</td>
<td>6.665</td>
<td>.003</td>
<td>.217</td>
</tr>
<tr>
<td>Pretest</td>
<td>44.385</td>
<td>1</td>
<td>44.385</td>
<td>.281</td>
<td>.598</td>
<td>.006</td>
</tr>
<tr>
<td>Group</td>
<td>2059.504</td>
<td>1</td>
<td>2059.504</td>
<td>13.049</td>
<td>.001</td>
<td>.214</td>
</tr>
<tr>
<td>Error</td>
<td>7575.522</td>
<td>48</td>
<td>157.823</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9679.412</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In Table 6, the results of the covariance analysis for Reading Comprehension Test posttest scores which were adjusted according to the pretest scores were displayed. There was a statistically significant difference in reading comprehension test mean scores of the experimental and control groups in favor of the experimental group after adjusting for pretest differences between groups. This difference supports hypothesis H2. These results show that strategies-based reading instruction increases the students’ comprehension level. The strength of the relationship assessed with Eta-square was moderately strong with the treatment variable accounting for 21% of the variance in reading comprehension level.

**Findings about retention test scores**

Table 7: The Results of the Covariance Analysis for the Reading Comprehension Test Retention Test Mean Scores, Adjusted According to the Pretest Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Eta-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>2440.021</td>
<td>2</td>
<td>1220.010</td>
<td>7.813</td>
<td>.001</td>
<td>.246</td>
</tr>
<tr>
<td>Pretest</td>
<td>133.893</td>
<td>1</td>
<td>133.893</td>
<td>.857</td>
<td>.359</td>
<td>.018</td>
</tr>
<tr>
<td>Group</td>
<td>2306.127</td>
<td>1</td>
<td>2306.127</td>
<td>14.769</td>
<td>.000</td>
<td>.235</td>
</tr>
<tr>
<td>Error</td>
<td>7495.273</td>
<td>48</td>
<td>156.152</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9935.294</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In Table 7, the results of the covariance analysis for Reading Comprehension Test retention test scores which were adjusted according to the pretest scores were displayed. There was a statistically significant difference in reading comprehension test mean scores of the experimental and control groups in favor of the experimental group after adjusting for pretest differences between groups. This difference supports hypothesis H2. These results show that strategies-based reading instruction increases the students’ comprehension level. The strength of the relationship assessed with Eta-square was moderately strong with the treatment variable accounting for 24% of the variance in reading comprehension level.

**DISCUSSION AND CONCLUSION**

The findings of the study show that strategies-based reading instruction increases students’ strategy use and comprehension level. The eta-square values show that the experimental application significantly explained the variability of the post and retention test scores.

With this study, it was found that strategies-based reading instruction has a significant effect on the two dependent variables, namely strategy use and comprehension level. According to the post and retention tests scores, after the experimental application students’ strategy use considerably improved in behalf of the experimental group. This result of the study was very similar to the previous study results that had revealed strategies-based instruction improved the strategy use (Çubukçu, 2008; Gürses, 2011; Arpacıoğlu, 2007; Çiçekoğlu, 2003; Kashef ve ark., 2014). The result of this study that strategies-based instruction improved the students’ comprehension level was also consistent with the other study results (Durgun, 2010; Razı, 2010; Gürses, 2011; Vardar, 2011; Aslan, 2007; Kürüm, 2012, Arpacıoğlu, 2007; Çiçekoğlu, 2003; Takallou, 2011; Aghaie ve Zang, 2011; Whichadee, 2011).

The main objective of the strategy training is to help the students use the strategies consciously at first, and then gain autonomy (Anderson, 2009). The goal of this kind of instruction is to help the learners become more self-awareness about how they learn more effectively, realize the ways in which they enhance their own learning, become more responsible for their own learning process and become more effective learners by individualizing the process. With the application of the strategies-based reading instruction the study can be said to achieve this objective. The use of the strategies increases during the experimental process, and this increase continued after the application. The results of the covariance analysis confirmed that strategies-based reading instruction has % 70 effects.
on the reading strategies use after the experimental process. This amount became %78 after the retention test which was conducted two months later.

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**REFERENCES**


RETHINKING THE SUPPORT SYSTEM FOR ADULT STUDENTS IN ONLINE LEARNING ENVIRONMENT

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Abstract
Adult students enrolling in online courses are confronted with a different to conventional learning environment which they have to adapt to immediately. New learning mode presents unique situations, initiatives and motivations which are inherently reflect on learners’ academic performance. Scholars argue that adults may feel lost in the educational transition and it is critical to consistently encourage and provide a supportive learning environment for them (Dahan and Baba, 2005).

In online and distance learning adequate support named among main factors that determine students success and findings stress that adult learners who feel unsupported may decide to withdraw from the program (Park & Choi, 2009; Bourdeaux & Schoenack, 2016).

There is an assumption that adult learners have a clear goals when returning to schools and, as a consequence, tend to be independent and self-directed in their educational journey. However, high drop-out rates indicate that adults’ perceptions of and experiences in online programmes are not well understood and it is not very clear how to address the difficulties students’ might have in order to support them better.

Keywords: Adult learning, support, online education.

INTRODUCTION

The popularity of online programmes is continuously increasing with the major demand coming from “adult learners who have no opportunity to access traditional education” (Ilgaz & Gülbahar, 2015; p. 171). It is stated that the main advantage of online education is that it allows adults who might not have otherwise been able to complete a college degree program to get a “second chance” (Dwyer, Thompson & Thompson, 2013).

The increase in number of adult students, also known in the literature as “non-traditional” (Dwyer et al., 2013), “returning” (Ladell-Thomas, 2012), or “back door” (Lee, 2017) students has resulted in a need for colleges and universities to look at the various factors and attributes of this population and what institutions need to do in order to serve their unique needs (Wyatt, 2011:10).

Recent studies recognise the diversity of adult learners population due to “dissimilar life experiences and academic backgrounds” (see Malinovski et al., 2016; Hsu et al., 2015). However, in the literature there is still a simplistic view on adult learners’ characteristics, which is mainly based on Knowles’ theory of andragogy (Lee, 2017), and on difficulties adults’ have or may have in online programmes. Little is currently known regarding the successful support practises that proved to work for adults with various personal and learning backgrounds in a unique online environment. And, unfortunately, adults who feel unsupported, facing additional barriers such as work and family commitments, may discontinue their enrollment in the course (Park & Choi, 2009).
ADULT STUDENT POPULATION

Cross referred to the term “non-traditional” more than twenty years ago (Cross, 1981). The reasons that led to increased enrolment of adult students into online courses and expectation of that group of “non-traditional” students since then had changed to some extent. As Cross noticed in the early periods mature students tended to be more grateful for the opportunities educational institutions offer to them, pointing out that current students are “client- service oriented, resources-stressed, and credential-oriented”; have higher expectations and less patient when encountering forms of inconvenience; see their education as “an investment of time and finances” (Cross, 1981).

Despite the recently emerged discussions on variations in adults’ perceptions, experiences or needs (see Kim and Frick, 2011; Baloyi, 2013; Dwyer, Thompson& Thompson, 2013; Kuo & Belland, 2016) in an online learning environment in the research literature actual differences of adults and difficulties they may have in online environment are not clearly understood (Taylor and House, 2010). There are debates on barriers faced by that particular population in online environment and what kind of support system is better for adult students but those discussions are mainly built on the basis of andragogical assumptions (see Merriam, 2001; Merriam & Caffarella, 1999) with a simplistic view on diverse adult population (see Lee, 2017). Taylor & House (2010) argue that “previous research has been simplistic in viewing differences among adult student population” and emphasised the need to analyse the varieties of that particular group of students (Taylor & House, 2010: 48).

There are also debates on what approaches in leaning and teaching are more appropriate for mature students. Some scholars state pedagogical, even andragogical, educational methods are no longer fully sufficient in dealing with adult learners, and a more self-directed and self-determined approach is needed (Kamenetz, 2010; Blaschke, 2012) while other argue that less mature learners require more instructor guidance and course scaffolding (Canning & Callan, 2010; Kenyon & Hase, 2010).

Today, several theories and models attempt to explain adult learning. However, there is no one theory that explains how adults learn (Brookfield, 1995) as every adult is different, “shaped by his or her history” and influenced by many variables (Cercone, 2008: 145). Existing theories provide frameworks or models, “each of which contributes something to our understanding of adults as learners” (Merriam & Caffarella, 1999: 271). Andragogy is one of the most well-known theories on adult learning that had been designed to address the particular needs of adults. It is based on the idea that there are significant differences in learning characteristics between children and adults (Knowles, 1980) and presents crucial assumptions about the characteristics of learners that consider the whole-person perspective in terms of the diagnosis of needs, learning climate, and the role of the learners’ experience. The assumptions of andragogy contrast sharply with the assumptions of pedagogy, which are that learners are dependent personalities who bring little or no experience to the educational activity. However, there is an evidence that assumptions developed by Knowles are not always true for adults. Scholars criticized the assumption about self-directedness of adults, stating that not all adult learners are self-directed (Cheren, 1983; Brookfield, 1995; Robinson, 1992; Schapiro, 2003). Robinson (1992) reported that learners do not prefer to be self-directed because they specifically indicated a desire for clear instructions as well as precise information from the course facilitator.

While andragogy has been widely criticized by scholars this framework is one of the most enduring and widely cited theories of adult learning (Merriam, 2001; Ross-Gordon & Jovita, 2011). Andragogy is not a perfect theory and it does not give the total picture of how adults learn. However authors pointing out that andragogy can be used as a starting point for approaching the adults in online learning environment (Brookfield, 1995). Andragogical assumptions can be viewed as a “goals for educators and might be used to guide the online course facilitator” to understand the realities of adult learners (Blondy, 2007). On the other hand, current technological changes pose important challenges to adult learning principles and some scholars argue that there is a “need to develop new
andragogical principles that are more relevant to the requirements of adults” (Ahedo, 2010: 240) and that learners with different characteristics may not only prefer, but benefit, from different instructional features and goals (Ausburn; 2004).

THE ISSUES OF LEARNING SUPPORT

The importance of learners’ support was named among critical factors that determine students success in an online program (Baloyi, 2013). For the purposes of this research, the concept of the learning support in an online and distance learning will be defined as “all activities and elements in education that respond to a known learner or group of learners, and which are designed to assist in the cognitive, affective, and systemic realms of the learning process” (Brindley, et. al, 2004).

The issue of support provided for adult students is broadly discussed in the literature. Niemann (2017) argue that the limited or no face-to-face interaction in distance education needs to be overcome by providing meaningful learning support focused on content and learning facilitation, while acknowledging the need for some personal advice and guidance (Niemann, 201). Kazis et al. (2007: 17) states that adult learners need a wide range of online support services, including “tutoring, financial aid advising and personal counselling” as well as career counselling. Rinear (2003: 5) reports that services provided to distance education students should minimally consist of a “technical support system, online library services, online administrative support (such as registration and financial aid), and instructional support (such as online tutoring)”. Study exploring adult students experience of learning support often report feelings of isolation, “little sense of connection and belonging” (Baloyi, 2013: 555) among learners, stress the difficulty to maintain engagement in, and motivation for, learning (Boyle et al, 2010; Baloyi, 2013).

Although studies suggest that adults’ profiles are unique and differ from one another (see, for example, Bates, 2005; Miller & Lu, 2003; Wyatt, 2011) there is not much discussion on what actual difficulties adult students have in online learning programmes and how these difficulties can be addressed.

METHOD

The Pilot study was developed to explore international adult students’ perceptions of, and experiences in, UK-based PhD distance programmes.

The learners received invitation to participating in one semi-structured interview (35- 60 mins in length). Potential participants who responded to the invitation email, were contacted, and convenient dates/times and the format of the interview (face-to-face, online, by telephone) were discussed. Eventually, the interview schedule was created. The interviews were held between April 2017 and July 2017. The students in total number of 22 from E-Research and Technology Enhanced Learning programme, Higher Education: Research, Evaluation and Enhancement programme and Health Research programme in Lancaster University were recruited to participate in the project. Interviews were conducted by author via Skype, telephone call or face-to-face using a semi-structured protocol where students were asked about their experience in online environment. The interviews were later transcribed after being completed.

The pilot study was used as a tool for a ‘soft’ research, allowing author to become aware of the differences in perceptions and experiences of each and every learner and test the feasibility of research methods before committing to a full-blown study. Participation in the pilot project helped researcher to determine the design for the further research study with a particular focus on adults’ differences in perceptions of and experiences in online learning, difficulties faced by learners and on support that may be provided to address these difficulties.
FINDINGS AND DISCUSSION

It was argued that online education is a perfect educational mode for adults who are usually work and have family commitments. But recent research shows that attracting students is not enough and emphasises that adults may be “lost in the educational transition” (Dahan and Baba, 2005) It is believed that in order to facilitate effective learning instructors should solicit and act upon the expectations of students (Houser, 2005; Bourdeaux & Schoenack, 2016). But as Lee (2017) pointing out the provision of the learning opportunities that serve learners’ diverse needs is a more challenging and complex task than just letting learners to enrol in the online program (Lee, 2017).

For the current article Moore’s interaction framework (1989) was used as a lens to look at the meaningfulness of different types of interaction for students: learner–learner interaction, learner–tutor interaction, and learner–content interaction. Kuo and Belland (2016) named learner–tutor interaction among the main factors influencing positive experience of students in online setting (Kuo & Belland, 2016). Overall the results of the pilot study correspond with the Kuo and Belland’s suggestion and showed that those of students who had a good connection with and a timely feedback from tutors were generally reporting more positive personal learning experience.

While stressing that in fully online learning programmes, learner–content interaction and learner–tutor interaction appear to be the significant factors for student satisfaction Kuo et al. (2014) argue that Interaction among students themselves does not usually have much influence on learners (Kuo et al. 2014). However, pilot study findings showed that for some students learner- learner interaction might be critical as well. Student 1 reported that connectedness with other learners and their support influenced her decision not to take the intercalation: “...in November I hadn’t done much and I was feeling, oh like it’s just too much work and maybe I should just defer to take an intercalation...But then I was encouraged by everybody [in What App chart group] saying, oh don’t bother with intercalation…”

Literature analysis showed that assumptions developed by Knowles are not always true for adults. Scholars often argue that not all adult learners are self-directed (Cheren, 1983; Lam, 1985; Brookfield, 1995; Robinson, 1992; Schapiro, 2003). Robinson (1992) reported that learners do not prefer to be self-directed because they specifically indicated a desire for clear instructions as well as precise information from the course facilitator. Although pilot study results also showed that in general learners prefer clear instruction and timely feedback from tutors, it is too early to make any conclusions or to open discussion about adults’ learning behavior in online environment. Moreover, it might be dangerous to criticize andragogical assumptions. The fact that adult learners prefer tutors or online institutions to give them clear instructions does not necessarily mean adults’ lack of self-direction or independency.

CONCLUSION

Scholars argue that many non-traditional students view online education as “an opportunity to shift to a different occupation”, coming back to school to invest in their future or because they “felt stuck with their current jobs” (Chao &Good, 2004:8), while others state that they enter or return to college after having faced a significant change or transition in their personal lives (Brickell, 1995; Haynes-Burton, 2003). The non-traditional students enrolled in these programmes have a distinct demographic profile from traditionally aged students, typically work full time and struggle to balance competing priorities. Thus effective support system is critical for their successful learning (Dahan and Baba, 2005). Many scholars highlight that understanding the perceptions, experiences and needs of learners is important in order to support learners better and emphasizing that negative experience in learning may cause frustration, loss of confidence, social isolation and economic loss (Ausburn, 2004; Moore & Kearsley, 1996; Poellhuber, Chomienne & Karsenti, 2008).
Cheren (1983) stated that while learners may express a desire to be self-directed in their learning, most lack the required understanding of learning necessary to be self-directed. It might be true that some adults need directions and encouragement in the learning process and that it is can be especially critical in the online environment (Cheren,1983; Conrad & Donaldson, 2004).

Despite potential difficulties, online learning environment allows adults to have input into their own learning goals and this can enhance the value of education for them (Palloff & Pratt, 2003). Scholars suggest that facilitator must encourage learners to become as self-directed as possible through the use of creative assignments and projects, encouraging their input and suggestions, while being available to provide guidance when needed (Palloff & Pratt, 1999; Blondy, 2007). But as it is also true that current technological changes and educational paradigm shift pose important challenges to adult learning and some authors argue that there is a “need to develop new andragogical principles that are more relevant to the requirements of adults” (Ahedo, 2009: 240). Adult learners with different characteristics may not only prefer, but benefit, from different instructional features and goals, and we tend to agree with Hsu and Hamilton (2008) that diverse adult learner population has a need for the use of varied and focused pedagogical approaches (Hsu and Hamilton, 2008).

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REFERENCES


FREE TIME MANAGEMENT, LEISURE PARTICIPATION AND SATISFACTION IN UNIVERSITY STUDENTS

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Abstract
The aim of the study is to examine free time management, leisure participation, leisure satisfaction and life satisfaction in university students. Population consisted of 3665 students taking elective physical education courses. From the sampling formula \( n = \frac{Nt^2pq}{d^2(N-1) + t^2pq} \) sample size was 348 and 400 students were included in the study. For data collection "Free time management", "Leisure Satisfaction" and "Life Satisfaction" scales were utilized. Mann Whitney U test and Spearman Correlation Coefficient were used in statistical analyses. Life satisfaction scores showed positive correlation with Leisure Satisfaction and Free time management subscales \((p<0.05)\). Goal setting, evaluating and leisure attitude subscales showed positive corelations. Women participants achieved higher scores in psychological, relaxation subscales of leisure satisfaction and leisure attitude and programming subscales of free time management scales \((p<0.05)\). For future studies free time management can be associated with leisure concepts such as perceived freedom and leisure meaning.

Keywords: Recreation, Leisure, Free Time Management, Life Satisfaction, Leisure Satisfaction.

INTRODUCTION

Being defined as one of the six domains of satisfaction from life (Headey, Veenhoven, & Wearing, 1991), leisure is an important concept in an individual's life. A definition by Stebbins (2005) states that "leisure could be defined as uncoerced activity undertaken during free time where such activity is something people want to do and at a personally satisfying level using their abilities and resources, they succeed in doing" (Schmiedeberg & Schröder, 2017). In short leisure refers to use free time for participating various physical, spiritual or social activities (Liang, Yamashita & Brown, 2013). According to Robinson and Godbey (1999), free time provides a good opportunity to individuals to do what they want to do and derive pleasure, happiness and self-expression (Wang, Wu, Wu, & Huan, 2012). The utilization of free time in a positive way is important and may result in personal and social improvement meanwhile if used negatively this may cause individual and social problems (Karaküçük, 2008).

Literature Review
The concept of free-time management refers to the situation that individuals use this uncommitted time efficiently by making an arrangement about their goals and setting priorities among the planned activities. According to a study applied to university students in Taiwan, free time management and quality of life showed positive significant relationships (Wang, Kao, Huan, & Wu, 2011). In another study, free-time management showed negative correlations with leisure boredom. This is important because when individuals can not use their free time healthily and constructively they may kill their time or even participate in destructive activities (Wang, Wu, Wu, & Huan, 2012). According to Wang...
and Kao (2006) free time management consists of steps like setting goals and priorities, adopting procedures, organizing and making schedules and cultivating an appropriate attitude towards free time. Besides all positive effects, the effective management of free time is expected to bring satisfaction with leisure which is the subjective valuation of leisure experience (Ateca Amestoy, Serrano-del-Rosal, Vera-Toscano, 2008). Leisure satisfaction is defined by Beard and Ragheb (1980) as the positive satisfaction or emotions an individual shows, achieves or obtains due to leisure participation. This is the satisfaction level that individual obtains from general leisure experiences. Beard and Ragheb (1980) suggested that it would be useful to inquire how satisfaction obtained from leisure choices relates to personal and social adjustment, mental health and overall happiness in order to improve quality of life of individuals (Ito, Walker, Liu, & Mitas, 2017). Beard and Ragheb (1980) measured leisure satisfaction in six dimensions such as psychologic, education, social, relaxation, psychiologic and aesthethic. The concept of leisure satisfaction was one of the main topics examined in leisure literature and was often connected with positive feelings referring to an individual’s life. There were various studies giving evidences for the positive relationship of leisure satisfaction with subjective well being (Ito Walker, Liu, & Mitas, 2017), happiness (Kaya, 2016), psychological health (Pearson, 2008), psychological well-being (Shin & You, 2013). One of the main concepts that leisure satisfaction was related to is leisure literature is life satisfaction. Life satisfaction is defined by Diener, Emmons, Larsen & Griffin (1985) as evaluation of an individual’s own life by the criteria set by himself/herself. In various studies life satisfaction is found to be related with leisure satisfaction (Agyar, 2014; Brown & Frankel, 1993; Ercan, 2016; Huang & Carleton, 2003; Kim, Roh, Kim, & Irwin, 2016).

University education is the last step towards the life of adulthood and the last step to gain habits and a healthy life style. Besides positive health and psychological effects (Carrutters & Hood, 2004; Haines, 2001; Todd, Czysczcon, Carr & Pratt, 2009), leisure participation provides opportunities for students to get rid of the intensity of academic life and go beyond the borders of classrooms and laboratories (Balca & Ilhan, 2006). So managing free-time and gaining awareness for the benefits of leisure is important for university students. According to the literature above mentioned the current study focuses on free-time management, leisure satisfaction and life satisfaction in university students.

METHOD

This study is a descriptive and cross-sectional study. Population of the study consisted of 3665 students participating in elective physical education courses. Sample size of the study was calculated with the formula \( n = \frac{N \times p \times q}{d^2 (N-1)} + t^2 pq \) and a sample size of 348 was obtained. After considering the data loss, 400 voluntary university students were selected randomly. Mean age of participants were 22.03± 1.819. Demographic information about participants were presented in Table 1.

| Table 1: Demographic Information of the Participants |
|-----------------------------------------------------|------|----------------|
| Gender                                             | n 231 | % 57.8         |
| Men                                                | 231  | 57.8          |
| Women                                              | 169  | 42.3          |
| Total                                              | 400  | 100           |
| Place of Birth                                     |     |               |
| City                                               | 358  | 89.5          |
| Town                                               | 33   | 8.3           |
| Village                                            | 9    | 2.3           |
| Total                                              | 400  | 100           |
| Perceived Economical Status                        |     |               |
| Very Good                                          | 33   | 8.3           |
| Good                                               | 214  | 53.5          |
| Average                                            | 134  | 33.5          |
| Poor                                               | 17   | 4.3           |
| Very Poor                                          | 2    | 0.5           |
| Total                                              | 400  | 100           |
Data collection tool of the study is a questionnaire consisting of five parts. In the first part demographic information, in the second part recreational activity participation are inquired. The third part of the data collection tool is “Life Satisfaction” scale developed by Diener, Emmons, Larsen, & Griffin (1985) and adapted to Turkish language by Köker (1991). The scale consisted of 5 questions with 7 point Likert scale that make up one dimension. Köker (1991) stated that the test re-test reliability coefficient of the scale was α= 0.85. The internal reliability of the scale was found as α= 0.903 in this current study. The fourth part of the questionnaire consisted of "Leisure Satisfaction Scale” developed by Beard and Ragheb (1980) and adapted to Turkish by Karlı, Polat, Yılmaz, & Koçak (2008). After the reliability and validity analyses, the Turkish version had 39 items of Likert 5-type with six subscales (Psychologic, Education, Social, Relaxation, Physiological, Aesthetic). The variance explained by factors was %45.277 and Cronbach Alpha was α=0.92. In this current study the Cronbach Alpha was 0.946 and between 0.772-0.859 for subscales. In the fifth part of the questionnaire form, “Free Time Management” scale developed by Wang, Kao, Huan, & Wu (2011) and adapted Turkish by Akgül and Karaküçük (2015) was used. According to the validity analyses, 4 factors explaining the 61% of variance were found. The number of items was 15. Goodness of fit indexes validated the factor structure (RMSEA=0.056; S-RMR=0.076; CFI=0.97; GFI=0.90 and RFI=0.87). Cronbach alpha level was 0.83 and test re-test reliability was 0.86. In this current study alpha coefficients were between 0.761-0.887 for subscales.

Statistical Analysis: Statistical analyses were carried out by SPSS 18.0. Besides descriptive statistics, Mann Whitney U test was used as data showed non-parametrical distribution. Non-parametrical Spearman Correlation test was utilized.

FINDINGS

In the findings section of the study, findings concerning recreational activity participation, life satisfaction, leisure satisfaction and free time management of the participants are presented. In Table 2 participants were asked with whom and why they join recreational activities and they were allowed to mark more than one choice.

Table 2: Recreational activity participation: With whom and why they participate?

<table>
<thead>
<tr>
<th>Level of Income</th>
<th>Frequency of ticks</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1000 TL.</td>
<td>14</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>1001-2000 TL.</td>
<td>120</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>2001-3000 TL.</td>
<td>62</td>
<td>15.5</td>
<td></td>
</tr>
<tr>
<td>3001-4000 TL.</td>
<td>45</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td>4001-5000 TL.</td>
<td>124</td>
<td>31.0</td>
<td></td>
</tr>
<tr>
<td>≥5001 TL</td>
<td>35</td>
<td>8.8</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I participate in recreational activities...</th>
<th>Frequency of ticks</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alone</td>
<td>289</td>
<td>72.3</td>
<td>400</td>
</tr>
<tr>
<td>With friends</td>
<td>365</td>
<td>91.3</td>
<td>400</td>
</tr>
<tr>
<td>With family</td>
<td>151</td>
<td>37.8</td>
<td>400</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.3</td>
<td>400</td>
</tr>
<tr>
<td>I participate in recreational activities...</td>
<td>It is enjoyable</td>
<td>342</td>
<td>85.5</td>
</tr>
<tr>
<td>I want to be with friends</td>
<td>264</td>
<td>66.0</td>
<td>400</td>
</tr>
<tr>
<td>I want to relax</td>
<td>255</td>
<td>63.7</td>
<td>400</td>
</tr>
<tr>
<td>I want to cope with stress</td>
<td>211</td>
<td>52.8</td>
<td>400</td>
</tr>
</tbody>
</table>
I want to enter a new environment 115 28.7 400
People around me motivate me 104 26.0 400
I want to cope with loneliness 98 24.5 400
I want to be happy 274 68.5 400
I want to learn new skills 159 39.8 400

According to Table 2, “participating with friends” was marked with highest frequency. Among 400 students 365 (91.3%) marked this choice. Additionally students were asked why they participate in recreational activities. Most of the tics were for the choice “It is enjoyable” with 85.5% and “I want to be happy” with 68.5%. In Table 3 the level of participation in recreational activities are given.

Table 3: Recreational Activity Participation of Participants

<table>
<thead>
<tr>
<th>Participation</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Duration of Participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5 hours</td>
<td>90</td>
<td>22.5</td>
</tr>
<tr>
<td>6-10 hours</td>
<td>227</td>
<td>56.8</td>
</tr>
<tr>
<td>11-15 hours</td>
<td>54</td>
<td>13.5</td>
</tr>
<tr>
<td>≥16 hours</td>
<td>29</td>
<td>7.2</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100</td>
</tr>
<tr>
<td>Weekly Frequency of Participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 times</td>
<td>75</td>
<td>18.8</td>
</tr>
<tr>
<td>3-4 times</td>
<td>210</td>
<td>52.5</td>
</tr>
<tr>
<td>5-6 times</td>
<td>93</td>
<td>23.3</td>
</tr>
<tr>
<td>≥7 times</td>
<td>22</td>
<td>5.5</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.0</td>
</tr>
<tr>
<td>Participation in Sport Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>328</td>
<td>82.0</td>
</tr>
<tr>
<td>Passive</td>
<td>72</td>
<td>18.0</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.0</td>
</tr>
<tr>
<td>Participation in Social Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>342</td>
<td>85.5</td>
</tr>
<tr>
<td>Passive</td>
<td>58</td>
<td>14.5</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.0</td>
</tr>
<tr>
<td>Participation in Cultural activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>225</td>
<td>56.3</td>
</tr>
<tr>
<td>Passive</td>
<td>175</td>
<td>43.8</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.0</td>
</tr>
</tbody>
</table>

When the findings in Table 3 is examined it is found out that participants mostly preferred to participate 6-10 hours (56.8%) and 3-4 times (52.5%) weekly. Active participation was preferred in sport activities (82.0%) and social activities (85.5%), and cultural activities (56.3%). In Table 4 descriptive statistics that participants obtained from scales are presented.

Table 4: Descriptive statistics obtained from scales

<table>
<thead>
<tr>
<th>Scales</th>
<th>n</th>
<th>X</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td>400</td>
<td>4.75</td>
<td>1.20</td>
</tr>
<tr>
<td>Leisure Satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychologic</td>
<td>400</td>
<td>3.93</td>
<td>0.68</td>
</tr>
<tr>
<td>Education</td>
<td>400</td>
<td>3.90</td>
<td>0.62</td>
</tr>
<tr>
<td>Social</td>
<td>400</td>
<td>3.78</td>
<td>0.64</td>
</tr>
<tr>
<td>Relaxation</td>
<td>400</td>
<td>4.13</td>
<td>0.78</td>
</tr>
</tbody>
</table>
According to the results in Table 4, participants have more than an average level of life satisfaction (4.75 ±1.20). When we consider leisure satisfaction scores the highest satisfaction is achieved from relaxation and aesthetic subscales. Among free time management subscales, leisure attitude has the highest score. This means that individuals consider leisure meaningful and important. In Table 5 the correlation between life satisfaction and leisure satisfaction is presented.

Table 5: Correlation Coefficients and Significance Levels for Life Satisfaction and Leisure Satisfaction

<table>
<thead>
<tr>
<th>Life Satisfaction</th>
<th>Leisure Satisfaction</th>
<th>Psychologic</th>
<th>Education</th>
<th>Social</th>
<th>Relaxation</th>
<th>Physiologic</th>
<th>Aesthetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life satisfaction</td>
<td>1</td>
<td>0.382***</td>
<td>0.350***</td>
<td>0.277***</td>
<td>0.235***</td>
<td>0.256***</td>
<td>0.308***</td>
</tr>
<tr>
<td>Free Time Management</td>
<td>0.174***</td>
<td>0.114***</td>
<td>0.258***</td>
<td>0.288***</td>
<td>-0.119*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05; **p<0.01, ***p<0.001

When the correlation coefficients between life satisfaction and leisure satisfaction scales are examined it was found out that there are significant positive correlations for all subscales. The highest correlation was between life satisfaction and overall leisure satisfaction levels \((r=0.382, p<0.001)\). In Table 6, correlation between life satisfaction and free time management is presented.

Table 6: Correlation Coefficients and Significance Levels for Life Satisfaction and Free Time Management

<table>
<thead>
<tr>
<th>Life Satisfaction</th>
<th>Free Time Management</th>
<th>Goal setting and technique</th>
<th>Evaluating</th>
<th>Leisure Attitude</th>
<th>Scheduling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life satisfaction</td>
<td>1</td>
<td>0.174***</td>
<td>0.114***</td>
<td>0.258***</td>
<td>-0.119*</td>
</tr>
</tbody>
</table>

*p<0.05; **p<0.01, ***p<0.001

When the correlation coefficients between life satisfaction and free time management are considered except scheduling subscale all the subscales had positive correlations with life satisfaction. The highest
correlation of life satisfaction was with leisure attitude ($r=0.288$, $p<0.001$). In Table 7, correlation between leisure satisfaction and free time management is presented.

Table 7: Correlation Coefficients and Significance Levels for Leisure Satisfaction and Free Time Management

<table>
<thead>
<tr>
<th>Leisure Satisfaction</th>
<th>Free Time Management</th>
<th>Goal setting and technique</th>
<th>Evaluating</th>
<th>Leisure Attitude</th>
<th>Scheduling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leisure satisfaction</td>
<td>1</td>
<td>0.410***</td>
<td>0.165**</td>
<td>0.499***</td>
<td>0.557***</td>
</tr>
<tr>
<td>Free Time Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal setting and technique</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leisure Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheduling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$p<0.05; **p<0.01, ***p<0.001$

When the correlation coefficients between leisure satisfaction and free time management are considered except scheduling subscale all the subscales had positive correlations with leisure satisfaction. The highest correlation of leisure satisfaction was with leisure attitude ($r=0.557$, $p<0.001$). In Table 8 comparisons of life satisfaction, leisure satisfaction and free time management according to sport participation are given.

Table 8: Comparisons according to active and passive sport participation

<table>
<thead>
<tr>
<th>Life satisfaction</th>
<th>Active Participants (n=328)</th>
<th>Passive Participants (n=72)</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL SCORE</td>
<td>4.82 1.16</td>
<td>4.46 1.37</td>
<td>-2.035</td>
<td>0.042</td>
</tr>
<tr>
<td>Leisure Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychologic</td>
<td>3.97 0.69</td>
<td>3.74 0.64</td>
<td>-3.044</td>
<td>0.002</td>
</tr>
<tr>
<td>Education</td>
<td>3.94 0.61</td>
<td>3.76 0.62</td>
<td>-2.292</td>
<td>0.022</td>
</tr>
<tr>
<td>Social</td>
<td>3.80 0.64</td>
<td>3.67 0.65</td>
<td>-1.900</td>
<td>0.057</td>
</tr>
<tr>
<td>Relaxation</td>
<td>4.16 0.77</td>
<td>3.98 0.81</td>
<td>-1.66</td>
<td>0.097</td>
</tr>
<tr>
<td>Physiologic</td>
<td>3.92 0.68</td>
<td>3.71 0.72</td>
<td>-2.155</td>
<td>0.031</td>
</tr>
<tr>
<td>Aesthetic</td>
<td>3.98 0.72</td>
<td>3.87 0.76</td>
<td>-1.140</td>
<td>0.254</td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td>3.94 0.54</td>
<td>3.76 0.55</td>
<td>-2.743</td>
<td>0.006</td>
</tr>
<tr>
<td>Free Time Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal setting and technique</td>
<td>3.07 0.98</td>
<td>3.32 0.93</td>
<td>-1.972</td>
<td>0.049</td>
</tr>
<tr>
<td>Evaluating</td>
<td>3.66 0.79</td>
<td>3.67 0.84</td>
<td>-0.165</td>
<td>0.869</td>
</tr>
<tr>
<td>Leisure Attitude</td>
<td>4.01 0.88</td>
<td>3.92 1.01</td>
<td>-0.490</td>
<td>0.624</td>
</tr>
<tr>
<td>Scheduling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td>3.38 0.56</td>
<td>3.43 0.55</td>
<td>-0.553</td>
<td>0.581</td>
</tr>
</tbody>
</table>

Comparisons were made in life satisfaction, leisure satisfaction and free time management according to sport participation. Life satisfaction, overall leisure satisfaction, psychologic, education and physiologic levels are higher in active sport participants ($p<0.05$). When free time management scores are considered, goal setting and technique was lower in active sport participants ($p<0.05$).
Table 9: Comparisons according to gender

<table>
<thead>
<tr>
<th></th>
<th>Males (n=231)</th>
<th>Females (n=169)</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(\bar{X})</td>
<td>Sd</td>
<td>(\bar{X})</td>
<td>Sd</td>
</tr>
<tr>
<td>Life satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td>4.61</td>
<td>1.16</td>
<td>4.87</td>
<td>1.25</td>
</tr>
<tr>
<td>Leisure Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychologic</td>
<td>3.84</td>
<td>0.71</td>
<td>4.06</td>
<td>0.62</td>
</tr>
<tr>
<td>Education</td>
<td>3.86</td>
<td>0.65</td>
<td>3.96</td>
<td>0.57</td>
</tr>
<tr>
<td>Social</td>
<td>3.76</td>
<td>0.65</td>
<td>3.80</td>
<td>0.64</td>
</tr>
<tr>
<td>Relaxation</td>
<td>4.05</td>
<td>0.76</td>
<td>4.22</td>
<td>0.79</td>
</tr>
<tr>
<td>Physiologic</td>
<td>3.85</td>
<td>0.72</td>
<td>3.92</td>
<td>0.64</td>
</tr>
<tr>
<td>Aesthetic</td>
<td>3.92</td>
<td>0.74</td>
<td>4.02</td>
<td>0.70</td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td>3.86</td>
<td>0.57</td>
<td>3.97</td>
<td>0.51</td>
</tr>
<tr>
<td>Free Time Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal setting and technique</td>
<td>3.06</td>
<td>1.03</td>
<td>3.18</td>
<td>0.90</td>
</tr>
<tr>
<td>Evaluating</td>
<td>3.60</td>
<td>0.81</td>
<td>3.74</td>
<td>0.77</td>
</tr>
<tr>
<td>Leisure Attitude</td>
<td>3.94</td>
<td>0.86</td>
<td>4.07</td>
<td>0.96</td>
</tr>
<tr>
<td>Scheduling</td>
<td>2.98</td>
<td>1.04</td>
<td>3.17</td>
<td>1.07</td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td>3.33</td>
<td>0.57</td>
<td>3.46</td>
<td>0.53</td>
</tr>
</tbody>
</table>

Comparisons were made in life satisfaction, leisure satisfaction and free time management according to gender and significant results were obtained. Life satisfaction, overall leisure satisfaction, psychologic, relaxation, overall free time management levels, leisure attitude, scheduling are higher in female participants (p<0.05).

DISCUSSION AND RESULTS

The aim of the study was to evaluate the findings of recreational activity participation, life satisfaction leisure satisfaction and free time management in university students. When demographic findings are considered, the group consisted of individuals who were 57.8% males, mostly born in cities, perceiving themselves with good and average socio-economic status. When the situation of participation in recreational activities is considered it was found out that students preferred to join activities with friends and they join the activities because they find activities enjoyable. Students preferred to join activities weekly 6-10 hours and 3-4 times a week. They participate sport, social and cultural activities actively. Life satisfaction level of the participants was average level. When leisure satisfaction derived from leisure participation is considered the highest scores were obtained from «Relaxation» subscale. In a study conducted to students who had played digital games in Taiwan «Psychological» subscale had the highest score (Hou, Tu, & Young, 2007). Among free time management subscales, leisure attitude has the highest score. This means that individuals consider leisure meaningful and important. Life satisfaction had positive and significant correlations with all subscales of leisure satisfaction. It can be concluded that the positive perceptions derived from leisure participation has a significant relationship with the satisfaction one derives from his/her life according to the criteria he/she sets. In leisure literature there are many studies with parallel results to these findings. There are studies where leisure satisfaction has positive correlation with life satisfaction. Griffin & McKenna (1998) and Gökçe (2008) found a significant relationship between life satisfaction and leisure satisfaction, Brown & Frankel (1993), Huang & Carleton (2003) and Agyar (2014) reported that there was a positive linear relationship between these two satisfactions. In this study positive perceptions of leisure such as leisure satisfaction showed positive correlation with free-time-management subscales except scheduling. In a study by Wang, Wu, Wu, and Huan (2012) negative perceptions of leisure such as leisure boredom showed negative correlations with free time
management in university students in Taiwan. In this current study life satisfaction showed positive correlations with goal setting and technique, evaluating and leisure attitude, while in a study by Akgül, Senol, and Karaküçük (2016), additionally scheduling subscale showed a positive correlation with life satisfaction. Wang, Kao, Huan, and Wu (2011) found positive correlation with quality of life for university students in Taiwan. According to the results women participants had higher scores from most of the leisure satisfaction subscales. There are studies parallel to these results (Gökçe, 2008; Vong Tze, 2005). But there are also studies which could not find any differences between genders concerning leisure experiences (Lu & Hu, 2005; Siegenthaller & O'Dell, 2000). When free time management is considered in this current study leisure attitude and scheduling was higher in females. In a study by Akgül, Senol and Karaküçük (2016) females had higher scores in scheduling. One of the limitations of the study was the size and representation of the sample. A sample representing the university students of Turkey would enable us to make generalizations. Further validity studies are recommended for leisure satisfaction scale. These concepts could be further used in relation with other psychological variables such as psychological well-being, self esteem and other perceptions of leisure activity participation. University education is the last step towards the life of adulthood and the last step to gain habits and a healthy life style. Gaining awareness for the benefits of leisure is also important. Therefore the literature concerning university students shows importance.

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**REFERENCES**


THE EFFECTS OF GAMING METHOD ON STUDENTS’ PROGRAMMING ACHIEVEMENT

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Abstract
In this study, the effects of using a game program developed for instruction of algorithms in programming lesson on students’ programming achievement was investigated. The randomized pretest-posttest control group design was used. The study was carried out for 10 weeks in the Alanya Aladdin Keykubat University-Akseki Vocational School in the Computer Programming department students who are studying in the 2015-2016 academic year. The randomized sampling method has been applied in the determination of experimental and control groups in these groups, the same lecturer organized lessons. The data were collected by pre-test and post-test. For analyzing data were used SPSS 20.0 for descriptive statistics and t-test analysis with 5% significance level. It was determined that the achievement of the group that was supported by learning with game differed significantly from the control group.

Keywords: Programming education, gaming method, vocational school.

INTRODUCTION

Programming is the important skills of 21st century. Everything in our lives is programmable: for example, on wearable technologies, smartphones and tablets. Developed programs are applications developed to solve problems with programmable tools. They are developed in a special programming language. For this reason, programmers need to have programming/coding skills (Pea, Kurland, 1984; Salomon & Perkins, 1987).

Coding can be expressed in the form of problem solving with an abstract language (Blackwell, 2002). It is one of the basic subjects of computer science (CS). Although it is such an important subject, learning programming languages can be complicated and difficult for many students (Milne & Rowe, 2002). It requires creativity. This situation can lead students to develop negative attitudes towards lectures, develop their thoughts that they can not succeed, and consequently fail (Robins, Rountree & Rountree, 2003).

Some students use memorization instead of learning, and they are again failing. In order to increase the motivation of the students, digital game supported programming tools are effective. In this point, visual programming tools can be used as a solution (Maloney, Resnick, Rusk, Silverman & Eastmond, 2010).

Visual Programming Tools
When a classical programming language is started to be taught to students, a complexity perception of language can occur in students (Chang, 2005). If the environment in which the programming language is developed has a graphical interface, or if the language is a visual programming language, it can cause less complexity perception than classical language learning or can’t cause complexity perception (Lewis, 2010). The simpler programming of visual blocks, without the need for coding, removes this problem almost entirely (Maloney, Peppier, Kafai, Resnick & Rusk, 2008).

Coding learning with visual tools allows students to see more concrete results of the applications they have developed. They have a design and production-oriented structure. Environments such as
Code.org, Scratch, Alice, and Code Game Lab are interactive visual programming environments that save students who use visual blocks from the complexity of the programming language semantics. It's easy to use with drag and drop technology. Language support is available. The students are trying to gain the programming skills with the related applications which are gained in the world of Coding Education (Resnick et al., 2009; Resnick, Martin, Sargent & Silverman, 1996; Rodger et al., 2009).

The most basic way to learn coding is to learn algorithms. Algorithm knowledge and skills of students are developing with these visual programming tools. Many countries in the world are still developing programming skills without improving their literacy skills (Kumar, 2014). For example, according to Code.org, with the Hour of Code activity in the code.org application, every year the program is being launched in the 180 countries (Eguchi, 2014). In these countries, these activities are supported at a high level (Layton, 2013). Participation in such visual programming activities is perhaps more than participation in traditional programming activities.

In many countries, like Spain, Hong Kong, Germany, programming education is included in school curricula (Wong, Cheung, Ching & Huen, 2015). At university level, classical programming trainings are carried out (Bennedsen & Caspersen, 2005). Generally, educators have used visual programming tools to facilitate lectures, to motivate and activate students, to provide individual learning and give homework (Asad, Tibi & Raiyn, 2016; Hwang, Shadley, Wang & Huang, 2012).

In this study, a visual programming tool including with game learning was used in algorithm teaching, and the effect of this method on the success of the algorithm course of the students was investigated. The visual programming tool used in this study is "code.org". The internet can be connected to the system with any device. It's free. If you are a member, individual development can be followed by both the student and the teacher. It has a user-friendly interface. Graphical and auditory elements are utilized. Interaction with the user is provided at a high level (Kalelioğlu, 2015).

Code.org also has some features that are different from other visual programming tools. Because of consisting gaming method, this programming tool is more attractive and more choice than others. It can be said that the platform is like a puzzle as a game. According to Tutgun Ünal et al. (2013) in digital game platforms, puzzle style games are the most preferred games. Because puzzles are games in which cognitive skills are employed and pieces are appropriately brought together. In the teaching of algorithmic logic, students can also offer trial opportunities. In the current research, one of the puzzle-style electronic games-code.org has been used.

The Purpose of the Study
The purpose of the study is to investigate the impact of the game-based algorithm program code.org on the success of students entering the programming course. In addition, this study compares the achievements of students learning with code.org and students taught using traditional approach. The research question of this study is “Is there a significant difference between the achievement of students in the control group and the experimental group in the introduction to programming course?”

The answer was sought. In order to answer this question, the following sub-questions have been answered.

a) Is there a significant difference between pre-test results of experimental and control group?
b) Is there a meaningful difference between the pre-test and post-test results of the experimental group?
c) Is there a significant difference between the pre-test and post-test results of the control group?
d) Is there a significant difference between post-test results of experimental and control group?
METHOD

The quantitative method is used to determine the effect of the algorithm learning method on the success of the students at the entrance to the programming lesson. The randomized pretest-posttest control group design was used.

Setting
The teaching of the algorithm topic has been realized within the course labeled the basics of programming. This course is one of the main courses taken in the fall semester.

In the traditional design of programming language course, control group students were taught algorithms, variables, decision-control structures, cycles, functions and debugging subjects during the first four weeks.

In the experiment group, students should first be a member of code.org site and the interface of the site is explained. A road map was drawn to help students navigate their learning within the site. Students were informed about completing Lesson 3 and Lesson 4 activities. It was stated that they could complete these applications outside the course. If students complete this application, they will be supported with additional applications. Activities in Lesson 3 and Lesson 4 relate to variables, decision-control structures, loops, functions, and debugging issues.

Both groups completed the basic programming lessons and then wrote the program with the C # programming language, one of the most used languages in the World, for 6 weeks. Total instruction completed in 10 weeks.

Sample
The study was carried out in the Alanya Aladdin Keykubat University Akseki Vocational School in the Computer Programming department students who are studying in the 2015-2016 academic year. The students were taken on a voluntary basis for research. The randomized sampling method has been applied in the determination of experimental and control groups. A pre-test has been conducted to measure the students' programming knowledge. Experimental and control groups were determined in the direction of very close results.

Data Collection
The data were collected by tests. At the beginning of the course, different instructional strategies were applied in the control group and experimental group in order to understand the logic of the algorithm for the first 4 weeks.

Throughout of the course, in experimental group “code.org” was used. All students in the experiment group have completed all the activities on course3 and course4 on code.org. Individual controls were performed. Through the system, the progress of the students was followed. At the same time, students in the control group were taught algorithmic logic with traditional approaches. The researcher used the projector to provide examples of algorithms and showed flow charts on the board. Subsequently, both the control group and treatment group students took a C # programming language course together for a period of six weeks. After the instruction is completed, all students complete the C # achievement test.

Data Collection Tools
The data of the study were obtained by pre-test and post-test. While the pre-test is aimed to measuring algorithm knowledge of students, the post test is aimed to measure the ability to write programs using the c # programming language.
The pre-test questions developed by the researcher and revised according to the opinions of the four field experts consist of 3 classical questions.

These questions were created for the creation of equivalent groups by the researcher. The post test involves 3 classical questions that should be answered using the C # language. Questions were developed by the researcher and checked by experts.

Data Analysis
The quantitative data collected from the tests were analyzed using SPSS 20.0 for descriptive statistics and t-test analysis with 5% significance level.

FINDINGS

Findings Related with Research Question 1
Findings related to pre-test scores to measure programming success of experimental and control groups are below in the Table 1.

Table 1: Pre-test Scores to Measure Programming Achievement of Experimental and Control Groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>x</th>
<th>Ss</th>
<th>Sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>50</td>
<td>35,83</td>
<td>20,06</td>
<td>60</td>
<td>0.037</td>
<td>0.986</td>
</tr>
<tr>
<td>Control</td>
<td>50</td>
<td>35,98</td>
<td>20,01</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A difference of 0.15 between the arithmetic mean of the experimental and control groups. T-test for understanding whether this difference is meaningful t = 0.037 and P = 0.986 > 0.05 (at the 95% confidence interval), there was no significant difference between the experimental group and the control group. Therefore, experimental and control groups are equivalent.

Findings Related with Research Question 2
Findings related to pre-test and post-test scores to measure programming success of experimental group are below in the Table 2.

Table 2: Comparison of Pre and Post Test Scores of the Experimental Group

<table>
<thead>
<tr>
<th>Tests</th>
<th>n</th>
<th>x</th>
<th>Ss</th>
<th>Sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>50</td>
<td>35,83</td>
<td>20,06</td>
<td>30</td>
<td>-6.961</td>
<td>0.000</td>
</tr>
<tr>
<td>Post-test</td>
<td>50</td>
<td>75,06</td>
<td>35.06</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The difference between the pretest-posttest arithmetic mean of the experimental group was 40.03. T-test for understanding whether this difference is meaningful t = -6.961 and P = 0.000 (at the 95% confidence interval) There was a significant difference between pre-test and post-test scores.

Findings Related with Research Question 3
Findings related to pre-test and post-test scores to measure programming success of control group are below in the Table 3.
Table 3: Comparison of Pre and Post Test Scores of the Control Group

<table>
<thead>
<tr>
<th>Tests</th>
<th>n</th>
<th>x</th>
<th>Ss</th>
<th>Sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>50</td>
<td>35,98</td>
<td>20,06</td>
<td>30</td>
<td>4,628</td>
<td>0.000</td>
</tr>
<tr>
<td>Post-test</td>
<td>50</td>
<td>50,89</td>
<td>10,81</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The difference between the pretest-posttest arithmetic mean of the control group was 14.91. T-test for understanding whether this difference is meaningful \( t = -4.628 \) and \( P = 0.000 \) (at the 95% confidence interval) There was a significant difference between pre-test and post-test scores.

Findings Related with Research Question 4

Findings related to post-test scores to measure programming success of experimental and control groups are below in the Table 1.

Table 4: Post-test Scores to Measure Programming Achievement of Experimental and Control Groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>x</th>
<th>Ss</th>
<th>Sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>50</td>
<td>75,06</td>
<td>35,06</td>
<td>60</td>
<td>4,666</td>
<td>0.002</td>
</tr>
<tr>
<td>Control</td>
<td>50</td>
<td>50,89</td>
<td>10,81</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The t-test results showed that the experimental group for gaming method implemented had a higher mean score than the control group for which traditional methods were implemented. There is a significant mean difference between the experimental group (\( x = 75.06, SD = 35.06 \)) and the control group (\( x = 50.89, SD = 10.81 \)) with the mean difference of 24.17; \( t (60) = 4.666, p <.05 \). There was a significant difference between the arithmetic mean of the experimental group and the control group. As you can see, the difference was favored by the experimental group.

DISCUSSION AND RESULTS

In this study, the effects of using a game developed for instruction of algorithms in programming lesson on students’ programming achievement was investigated. The achievement of students using game was compared with the achievement of students learning through the traditional approach. The quantitative method is used to determine the effect of the algorithm learning method on the success of the students at the entrance to the programming lesson. The randomized pretest-posttest control group design was used. Results showed that the experimental group, game was used, had a higher mean score than the control group, traditional methods were implemented. A significant mean difference between the groups was found. It has been seen that gaming method has been applied in the teaching of programming and it has been positively affecting the success of the student.

Studies of Bergin & Reilly (2005) and Shellington, Humphries, Morsi & Rizvi (2015) overlap with this research results. Shellington et al. (2015) highlights that students enjoy games when especially learning programming and students’ skills develop related with identify correct and incorrect syntax. Likewise, Dogan & Kert (2016) stated that learning with games has a positive effect on critical thinking skills and algorithmic achievements according to the classical methods.

Gaming method which is active in the process of student learning, encourages independent learning individuals to encourage their own or group solving of the problems that lead to their ideas; can be
used alone or in combination with other methods in teaching programming as a teaching method among the new approaches.

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**REFERENCES**


LEISURE PARTICIPATION, INTERNET ADDICTION AND LEISURE BOREDOM IN UNIVERSITY STUDENTS

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Abstract
The aim of the study is to examine the leisure participation, internet addiction and leisure boredom in university students. Population consisted of 3665 students taking elective physical education courses. From the sampling formula \( n = Nt \frac{pq}{d^2} (N-1) + t^2 pq \) sample size was 348 and 498 students were selected as sample. For data collection “Internet Addiction” and “Leisure Boredom” scales were utilized. Mann Whitney U test and Spearman Correlation Coefficient were used in statistical analyses. Leisure boredom scores showed positive correlation with social isolation and withdrawal, meanwhile leisure satisfaction scores showed negative correlations with control difficulty, withdrawal, disorder in functionality and social isolation. Active sport participants had lower boredom, lower satisfaction, lower withdrawal levels. Women participants showed higher boredom, satisfaction and lower withdrawal scores \((p<0.05)\). For future studies internet addiction can be associated with various leisure concepts such as family leisure or leisure education.

Keywords: Recreation, Leisure, Internet Addiction, Leisure Boredom.

INTRODUCTION

The Internet is a network of millions of computers used for exchanging information, academical research, entertainment, communication and commerce (Frangos, Frangos & 2010). Despite the benefits that people derive from internet, the negative impacts of internet on an individual’s daily life function, family relationships and emotional stability were mentioned as terms like “Internet addiction”, “Problematic internet usage” or “Pathological internet use”(Dalbuk et al., 2013; Ko, Yen, Yen, Chen, & Chen, 2012). The problematic usage of Internet or “Internet Addiction” is defined as “inability to control one’s use of the Internet which leads to negative consequences in daily life” (Scherer, 1997; Young, 1998; Li, O’Brien, Snyder, & Howard, 2015). With increasing concern on this problem there were many studies comparing excessive Internet users with others, case studies of these groups, psychometric properties of these groups, heavy usage and problems like depression, loneliness, academic performance, or different vulnerable groups like students (Niemz, Griffiths, & Banyard, 2005).

Literature Review
Positive way of using the Internet was explained with the term “healthy internet use” which was defined as “using the Internet to achieve a specific aim within and appropriate time frame with no conceptual or behavioral difficulties ”(Davis, 2001; Odacı & Kalkan, 2010). For the unhealthy way of internet usage different researchers used different terms such as “Internet Addiction”(Goldberg, 1997), “Internet Dependency”(Scherer, 1997) or “Pathological Internet Use” (Davis, 2001) taking into
consideration the length of time spend on the internet, being restless, tense and irritable while not using the Internet and feeling a strong need to be longer on the internet (Young & Rodgers, 1998; Odaci & Kalkan, 2010). In another study common criteria to define Internet Addiction are excessive use of internet that is loss of sense of time, concept of withdrawal, that is having feelings of anger, tension or depression when one can not access computer, needing more advanced equipment and more hours of use, negative social results (Tao et al., 2010). In some studies there are findings showing that internet users began to show parallel behaviours of drug, alcohol or gambling addicts (Young 1998; Ceyhan, Ceyhan, & Gurcan, 2007). Internet addiction was related with different psychological variables such as depression and in a recent study applied to students, internet addiction had positive correlation with depression as well as anxiety and stress (Akin & Iskender, 2011). Depression was related with internet addiction besides loneliness and a positive relationship was obtained in Turkish university students meanwhile a negative correlation was found with social support (Keser Ozcan & Buzlu, 2007). The relationship of loneliness and internet addiction was inquired in Turkish university students and a positive relationship was obtained with loneliness, and communication anxiety (Odaci & Kalkan, 2010). Excessive internet usage was found to be causing academic, social and interpersonal problems and these users showed lower levels of self-esteem (Niemz, Griffiths & Banyard, 2005). Other problems reported in university students who are overusing Internet are sleep deprivation, academic failure in achievement, lack of exercise, failure in engaging face-to-face social activities, decreased ability to concentrate (Li, O’Brien, Snyder, & Howard, 2015). In Hong Kong, heavy users of internet showed lower likelihood of engaging in healthy activities such as exercising but shows unhealthy behaviours such as skipping meals or sleeping late (Kim et al., 2010). Internet addiction was also related with personality traits and agreeableness and extraversion was negatively associated with internet addiction in Italian university students (Servidio, 2014). Among English university students, frequent online shopping and social online activities, high neuroticism and low agreeableness increased the chances of having Internet addiction (Kuss, Griffiths, & Binder, 2013).

One of the important problem that internet addicts are facing is time management problems (Chou, Condron, & Belland, 2005; Lin, Lin & Wu, 2009) which may result from being unable to allocate time properly to different leisure activities. In a study conducted to Korean adolescents showed that the concept of leisure constraints was an important determinant on the level of problematic involvement in Internet gaming. If young people can overcome leisure constraints, manage leisure and feel satisfied with different leisure activities in the real life they may not need to spend time online so much. But if they feel bored and lack satisfaction during leisure activities they may see Internet as an alternative way of spending leisure (Lin, Lin & Wu, 2009). The concept of boredom is described as “an anxiety about the absence of meaning or loss of purpose in an activity or situation, accompanied by feelings of dissatisfaction, irritability, restlessness, stress and a sense of entrapment” (Wegner, 2011). Leisure boredom occurs when individuals do not feel enough satisfaction from their leisure experiences, their needs are not met during these leisure experiences, they lack necessary skills to participate in activities and they do not find the activities challenging enough (Iso-Ahola & Weissinger, 1990; Wegner, Flisher, Chikobvud, Lombard, & King, 2008). According to Iso-Ahola and Weissinger (1987) there are six psychological factors which decrease the perception of leisure boredom: a larger leisure repertoire, lower perception of leisure constraints, higher level of awareness for leisure value, higher leisure ethic, lower work ethic and higher level of self-motivation (Barnett, 2005). One of the studies highlighting the importance of leisure boredom showed no significant relationship between alcohol use and leisure boredom in university students in Australia but in another study the combined influence of peer pressure and leisure boredom predicted substance use among adolescents in South Africa (Hendricks, Savahl, & Florence, 2015). According to a study conducted to adolescents in Taiwan, leisure boredom and involvement in internet increases the likelihood of internet addiction meanwhile family and outdoor activities decrease the probability of internet addiction (Lin, Lin & Wu, 2009). When all the above mentioned literature is examined it can be observed that Internet addiction is a worldwide problem among university students. As internet use is stated to be highest during ages 16-24 according to studies conducted (Kandell, 1998; Öztürk et al., 2007; Odaci, 2010), it can be proposed that university students are a potential risk group for internet addiction (Odaci & Kalkan, 2010).
So the aim of the study is to examine internet addiction and leisure boredom in university students.

**METHOD**

This study is designed as descriptive and cross-sectional study. Population of the study consisted of 3665 students taking elective physical education courses in Akdeniz University. From the sampling formula \( n = N \frac{t^2pq}{d^2(N-1) + t^2pq} \) sample size was calculated as 348 and 500 students were taken to sample where 498 students returned back the questionnaires (rate of return=99.6%). Mean age of participants was 20.99± 2.43. Demographic information about participants were presented in Table 1.

**Table 1: Demographic Information of the Participants**

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>155</td>
<td>31.1</td>
</tr>
<tr>
<td>Women</td>
<td>343</td>
<td>68.9</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Place of Birth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>388</td>
<td>77.9</td>
</tr>
<tr>
<td>Town</td>
<td>83</td>
<td>16.7</td>
</tr>
<tr>
<td>Village</td>
<td>27</td>
<td>5.4</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Perceived Socio-Economical Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low</td>
<td>2</td>
<td>.4</td>
</tr>
<tr>
<td>Low</td>
<td>56</td>
<td>11.2</td>
</tr>
<tr>
<td>Middle</td>
<td>319</td>
<td>64.1</td>
</tr>
<tr>
<td>High</td>
<td>121</td>
<td>24.3</td>
</tr>
<tr>
<td>Very High</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Level of Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤2000 TL.</td>
<td>248</td>
<td>49.8</td>
</tr>
<tr>
<td>2001-3000 TL.</td>
<td>129</td>
<td>25.9</td>
</tr>
<tr>
<td>3001-4000 TL.</td>
<td>59</td>
<td>11.8</td>
</tr>
<tr>
<td>4001-5000 TL.</td>
<td>19</td>
<td>3.8</td>
</tr>
<tr>
<td>≥5001 TL.</td>
<td>43</td>
<td>8.6</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Data collection tool of the study is a questionnaire consisting of four parts. In the first part demographic information, in the second leisure participation are inquired. In the third part of the data collection tool, “Leisure Boredom Scale” developed by Iso-Ahola and Weissinger (1990) and adapted to Turkish by Kara, Gürbüz and Öncü (2014) was used. According to the explanatory factor analysis, 47.96% of the variance was explained. Reliability coefficients were \( \alpha=0.72 \) for both subscales named “Boredom” and “Satisfaction”. The scale consisted of 10 questions of 5-point Likert type. The goodness of fit indexes obtained from confirmatory factor analysis validated the factor structure of the scale. (Chi-square/df=1.83, RMSEA=0.05, SRMR=0.05, CFI=0.95, GFI=0.96, NFI=0.90). Reliability coefficients were found to be \( \alpha=0.764 \) and \( \alpha=0.727 \) for “Boredom” and “Satisfaction” subscales respectively. The fourth part of the questionnaire form was “Internet Addiction Scale” developed by Günüç (2009). The scale was developed by examining the literature and students’ views. The reliability coefficient was found as \( \alpha=0.944 \). According to the exploratory factor analysis, 47.463% of the variance is explained. The scale consisted of 35 questions of 5-point Likert type which were distributed under four subscales named “Withdrawal”, “Controlling difficulty”, “Disorder in functionality”, “Social isolation”. The goodness of fit indexes obtained from confirmatory factor analysis validated the factor structure of the scale (Chi-square=1187.430, RMSEA=0.039, CFI=0.870, GFI=0.830). Reliability coefficients were found to be \( \alpha=0.859 \), \( \alpha=0.904 \), \( \alpha=0.936 \) and \( \alpha=0.900 \) respectively for the subscales in this current study.
Statistical analyses were carried out by SPSS 18.0. Besides descriptive statistics, Mann Whitney U test, Kruskall Wallis tests were used as data showed non-parametrical distribution. Non-parametrical Spearman Correlation test was utilized.

FINDINGS

In the findings section of the study, findings concerning leisure participation, internet addiction and leisure boredom are presented.

Table 2: Recreational activity participation: With whom do they participate

<table>
<thead>
<tr>
<th></th>
<th>Frequency of ticks</th>
<th></th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>I participate in recreational activities...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>135</td>
<td>27.1</td>
<td>498</td>
</tr>
<tr>
<td>With friends</td>
<td>422</td>
<td>84.7</td>
<td>498</td>
</tr>
<tr>
<td>With family</td>
<td>262</td>
<td>52.6</td>
<td>498</td>
</tr>
</tbody>
</table>

According to Table 2, “participating with friends” was marked with highest frequency. Among 498 students 422 (84.7%) marked this choice. In Table 3 the level of participation in recreational activities are given.

Table 3: Recreational Activity Participation of Participants

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Duration of Participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5 hours</td>
<td>175</td>
<td>35.1</td>
</tr>
<tr>
<td>6-10 hours</td>
<td>162</td>
<td>32.5</td>
</tr>
<tr>
<td>11-15 hours</td>
<td>105</td>
<td>21.1</td>
</tr>
<tr>
<td>≥16 hours</td>
<td>56</td>
<td>11.2</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Frequency of Participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 times</td>
<td>195</td>
<td>39.2</td>
</tr>
<tr>
<td>3-4 times</td>
<td>220</td>
<td>44.2</td>
</tr>
<tr>
<td>5-6 times</td>
<td>68</td>
<td>13.7</td>
</tr>
<tr>
<td>≥7 times</td>
<td>15</td>
<td>3.0</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participation in Sport Activities</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>313</td>
<td>62.9</td>
</tr>
<tr>
<td>Passive</td>
<td>185</td>
<td>37.1</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participation in Social Activities</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>394</td>
<td>79.1</td>
</tr>
<tr>
<td>Passive</td>
<td>91</td>
<td>18.3</td>
</tr>
<tr>
<td>Total</td>
<td>485</td>
<td>97.4</td>
</tr>
<tr>
<td>Missing</td>
<td>13</td>
<td>2.6</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participation in Cultural Activities</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>253</td>
<td>50.8</td>
</tr>
<tr>
<td>Passive</td>
<td>204</td>
<td>41.0</td>
</tr>
<tr>
<td>Total</td>
<td>457</td>
<td>91.8</td>
</tr>
<tr>
<td>Missing</td>
<td>41</td>
<td>8.2</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>100.0</td>
</tr>
</tbody>
</table>

When the findings in Table 3 is examined it is found out that participants mostly preferred to participate 1-5 hours (35.1%) and 3-4 times (44.2%) weekly. Active participation was preferred in sport activities (62.9%) and social activities (79.1%), meanwhile passive participation was preferred in cultural activities (50.8%). In Table 4 descriptive statistics that participants obtained from scales are presented.
Table 4: Descriptive statistics obtained from scales

<table>
<thead>
<tr>
<th>Scales</th>
<th>n</th>
<th>X</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leisure Boredom Scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boredom</td>
<td>498</td>
<td>2.62</td>
<td>0.94</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>498</td>
<td>3.27</td>
<td>0.87</td>
</tr>
<tr>
<td><strong>Internet Addiction Scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td>498</td>
<td>2.99</td>
<td>0.81</td>
</tr>
<tr>
<td>Controlling Difficulty</td>
<td>498</td>
<td>2.31</td>
<td>0.81</td>
</tr>
<tr>
<td>Disorder in Functionality</td>
<td>498</td>
<td>2.29</td>
<td>1.09</td>
</tr>
<tr>
<td>Social Isolation</td>
<td>498</td>
<td>1.98</td>
<td>0.83</td>
</tr>
</tbody>
</table>

According to the results in Table 4, the highest scores from “Leisure Boredom” were achieved from “Satisfaction” subscale. When “Internet Addiction Scale” is considered, the highest score was obtained from “Withdrawal” subscale. In Table 5 the correlation scores between Leisure Boredom and Internet Addiction Scales are presented.

Table 5: Correlation Coefficients Between Leisure Boredom and Internet Addiction Scales

<table>
<thead>
<tr>
<th></th>
<th>Boredom</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boredom</td>
<td>1.00</td>
<td>.065</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>.065</td>
<td>1.00</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>.153**</td>
<td>-.186**</td>
</tr>
<tr>
<td>Controlling Difficulty</td>
<td>.087</td>
<td>-.205**</td>
</tr>
<tr>
<td>Disorder in Functionality</td>
<td>.008</td>
<td>-.230**</td>
</tr>
<tr>
<td><strong>Social Isolation</strong></td>
<td>.149**</td>
<td>-.264**</td>
</tr>
</tbody>
</table>

* p<0.05; ** p<0.01, *** p<0.001

According to the results in Table 5, “Boredom” subscale of “Leisure Boredom” scale showed positive correlations with “Withdrawal” and “Social Isolation” subscales of “Internet Addiction Scale” (r= .153 and r=.149 respectively, p<0.05). When participants feel bored, they do not know what to do in leisure time and do not have knowledge and skills in leisure activities, they may feel more lacking for internet usage, they may need to run away from problems and use internet or their happiest time may be when they are using the internet. Or vice versa. Similarly, when leisure boredom increases internet becomes a better friend and social isolation increases or vice versa. “Boredom” subscale had positive correlations with “Control disability” and “Disorder in functionality” subscales but the correlations were not significant (p>0.05). When “Satisfaction” subscale of “Leisure Boredom” scale is considered it is found out that all subscales of Internet Addiction scale had negative and significant correlations with Satisfaction levels (p<0.05). The more participants perceived leisure as an important part of their life quality and feel excited and motivated, the lower they got from the withdrawal, controlling difficulty, disorder in functionality and social isolation subscales. The highest negative correlations of “Satisfaction” subscale was with “social isolation” subscale (r= -.264, p<0.05. When participants derive higher satisfaction from leisure experiences their tendency to socialize in internet environment and socialization problems with friends decrease. In table 6, the scores that participants obtained from “Leisure Boredom” and “Internet Addiction” scales are compared according to participating actively and passively to leisure sport activities.
Table 6: Comparison of Leisure Boredom and Internet Addiction Scores According to Sport Participation

<table>
<thead>
<tr>
<th></th>
<th>Active Participants (n=313)</th>
<th>Passive Participants (n=185)</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leisure Boredom Scale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boredom</td>
<td>2.42</td>
<td>2.96</td>
<td>-5.638</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>3.17</td>
<td>3.46</td>
<td>-4.079</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td><strong>Internet Addiction Scale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td>3.04</td>
<td>2.92</td>
<td>-2.191</td>
<td>0.028</td>
</tr>
<tr>
<td>Controlling Difficulty</td>
<td>2.17</td>
<td>2.53</td>
<td>-3.360</td>
<td>0.001</td>
</tr>
<tr>
<td>Disorder in Functionality</td>
<td>2.28</td>
<td>2.31</td>
<td>-0.925</td>
<td>0.355</td>
</tr>
<tr>
<td>Social Isolation</td>
<td>1.96</td>
<td>2.02</td>
<td>-0.017</td>
<td>0.986</td>
</tr>
</tbody>
</table>

The scores that participants obtained from “Leisure Boredom” and “Internet Addiction” scales are compared according to participating actively and passively to leisure sport activities and according to the results, active sport participants had lower boredom scores and lower satisfaction scores. Also withdrawal is higher in active participants and controlling difficulty is higher in passive participants (p<0.05). In table 7, the scores that participants obtained from “Leisure Boredom” and “Internet Addiction” scales are compared according to participating actively and passively to social activities.

Table 7. Comparison of Leisure Boredom and Internet Addiction Scores According to Social Activity Participation

<table>
<thead>
<tr>
<th></th>
<th>Active Participants (n=394)</th>
<th>Passive Participants (n=91)</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leisure Boredom Scale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boredom</td>
<td>2.64</td>
<td>2.51</td>
<td>-0.307</td>
<td>0.759</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>3.34</td>
<td>2.91</td>
<td>-1.658</td>
<td>0.097</td>
</tr>
<tr>
<td><strong>Internet Addiction Scale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td>2.92</td>
<td>3.32</td>
<td>-5.664</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Controlling difficulty</td>
<td>2.20</td>
<td>2.82</td>
<td>-7.525</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Disorder in functionality</td>
<td>2.09</td>
<td>3.23</td>
<td>-8.430</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Social Isolation</td>
<td>1.80</td>
<td>2.88</td>
<td>-10.910</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

The scores that participants obtained from “Leisure Boredom” and “Internet Addiction” scales are compared according to participating actively and passively to social activities and according to the
results, internet addiction is lower in all subdimensions of internet addiction scale (p<0.05). Meanwhile leisure boredom levels did not reveal any significant results (p>0.05).

Table 8: Comparison of Leisure Boredom and Internet Addiction Scores According to Gender

<table>
<thead>
<tr>
<th></th>
<th>Males (n=155)</th>
<th>Females (n=343)</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leisure Boredom Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boredom</td>
<td>2.41 0.84</td>
<td>2.71 0.97</td>
<td>-2.797</td>
<td>0.005</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>3.10 1.01</td>
<td>3.36 0.78</td>
<td>-2.253</td>
<td>0.024</td>
</tr>
<tr>
<td>Internet Addiction Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td>3.19 0.81</td>
<td>2.90 0.79</td>
<td>-2.746</td>
<td>0.006</td>
</tr>
<tr>
<td>Controlling difficulty</td>
<td>2.22 0.66</td>
<td>2.34 0.87</td>
<td>-0.536</td>
<td>0.592</td>
</tr>
<tr>
<td>Disorder in functionality</td>
<td>2.22 0.91</td>
<td>2.32 1.15</td>
<td>-0.662</td>
<td>0.508</td>
</tr>
<tr>
<td>Social Isolation</td>
<td>1.93 0.67</td>
<td>2.01 0.89</td>
<td>-0.402</td>
<td>0.688</td>
</tr>
</tbody>
</table>

The scores that participants obtained from “Leisure Boredom” and “Internet Addiction” scales are compared according to gender and females showed significantly higher boredom and satisfaction levels when compared with males. Another significant result was obtained from withdrawal scores. Males showed higher withdrawal scores which can mean that they may have more serious problems compared with females when they can not use access internet.

DISCUSSION AND CONCLUSION

The aim of the study is to examine internet addiction and leisure boredom in university students. 498 university students participated in this study with a mean age of 20.99± 2.43. Sample consisted of participants who were born in cities, perceived their economical status as medium and females had a higher percentage in the sample. Participants preferred to join recreational activities actively with friends (84%), prefered a duration of 1-5 hours and frequency of 3-4 times a week. When scores obtained from "Internet addiction” scale is considered it can be observed that participants had higher scores in “Satisfaction” subscale. This can show that students perceive their leisure experiences as important for their quality of life and participants are eager to be active and try new activities. This result is parallel with the results reported in a study by Kara, Gürbüz & Öncü (2014). Among the subscales of “Internet addiction” scale, withdrawal subscale indicated the highest scores. This may show that participants might have a feeling of deprivation or lacking for internet use, feel unhappy when they can not have use internet and internet use provides relaxation for these people. The lowest scores obtained from “Internet addiction” scale was from social isolation subscale. This may indicate lower levels of having problems with friends due to internet use. “Boredom” subscale of “Leisure Boredom” scale showed positive correlations with “Withdrawal” and “Social Isolation” subscales of “Internet Addiction Scale”. When participants feel bored, do not know what to do in leisure time and do not have knowledge and skills in leisure activities, they may feel more lacking for internet usage, they may need to run away from problems and use internet or their happiest time may be when they are using the internet... Similarly, when leisure boredom increases internet becomes a better friend and social isolation increases or vice versa. “Boredom” subscale had positive correlations with “Control disability” and “Disorder in functionality” subscales but the correlations were not significant (p>0.05). When “Satisfaction” subscale of “Leisure Boredom” scale is considered it is found out that all subscales
of Internet Addiction scale had negative and significant correlations with Satisfaction levels (p<0.05). The more participants perceived leisure as an important part of their life quality and feel excited and motivated, the lower they got from the withdrawal, controlling difficulty, disorder in functionality and social isolation subscales. The highest negative correlations of “Satisfaction” subscale was with “social isolation” subscale. When participants derive higher satisfaction from leisure experiences their tendency to socialize in internet environment and socialization problems with friends decrease. The scores that participants obtained from “Leisure Boredom” and “Internet Addiction” scales are compared according to participating actively to social activities and according to the results, internet addiction is lower in all subdimensions of internet addiction scale for active participants (p<0.05). Meanwhile leisure boredom levels did not reveal any significant results (p>0.05). The scores that participants obtained from “Leisure Boredom” and “Internet Addiction” scales are compared according to gender and females showed significantly higher boredom and satisfaction levels when compared with males. Another significant result was obtained from withdrawal scores. Males showed higher withdrawal scores which can mean that they may have more serious problems compared with females when they can not use access internet. In a cross-national study comparing the Internet addiction levels of Chinese and U.S. students where Chinese students showed higher dependency to internet, males showed higher rate of addiction than females (Zhang, Amos & McDowell, 2008). This result is consistent with another study conducted to Italian university students where males were found to be more inclined to use the internet than females (Servidio, 2014). Also in Turkish university students levels of problematic Internet use in males was significanly higher than female students (Odacı & Kalkan, 2010). One of the limitations of the study was the size and representation of the sample. A sample representing the university students of Turkey would enable us to make generalizations. As university students might be a risk group for an excessive use of internet and face with the consequences that this situation may bring the literature concerning leisure habits and internet use is gaining importance. Internet addiction could be further inquired with other leisure concepts.

REFERENCES


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THE EFFECT OF PREDICT-OBSERVE-EXPLAIN TECHNIQUE ON THE UNDERSTANDINGS OF GRADE 11 STUDENTS ABOUT THE GASES

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Abstract
The purpose of the present study is to investigate the effect of the activities based on Predict-Observe-Explain (POE) technique on grade 11 students' conceptual understanding and alternative conceptions of the gases. The study was conducted in an Anatolian high school in Trabzon and used the quasi-experimental design. Two classes at the school were randomly selected for the study. While one of the classes was randomly assigned as experimental group (N=36), the other was determined as control group (N=37). Gases Concept Test (GCT) consisting of 20 multiple choice items was used. The test’ reliability coefficient (KR-20) was found 0.84. Eight activities based on POE technique were developed and applied to the experimental group students. On the other hand, the control group students were taught by traditional approach. The results indicated that the experimental group students taught with the POE technique showed a higher success than the control group students.

Keywords: Chemistry education, POE technique, Gases.

INTRODUCTION
Many studies in the science literature have shown that students have difficulty in understanding many basic chemistry concepts and come to chemistry classes with knowledge (alternative conceptions) which is inconsistent with the scientific conceptions (Özmen, Demircioğlu & Demircioğlu, 2009). This situation is also similar for many basic science concepts. Alternative conceptions may hinder subsequent learning because students often do not know that the knowledge they have is wrong and try to build new knowledge on these erroneous conceptions. There have been a number of studies on students’ alternative conceptions related to many basic chemistry concepts, such as particulate nature of matter (Abraham, Williamson & Westbrook, 1994), gases (Demircioğlu & Yadigaroglu, 2014), equilibrium (Gussarsky & Gorodetsky, 1990), chemical bonding (Coll & Treagust, 2003), and electrochemistry (Garnett & Treagust, 1992). Of these, the gases and related concepts are investigated in the present study. The gas concepts are one of the fundamental and difficult concepts of chemistry. Students at all age groups have difficulty in understanding these concepts (Demircioğlu & Yadigaroglu, 2014, Demircioğlu, Tütüncü & Demircioğlu, 2016; Gürses et al., 2012). Demircioğlu, Tütüncü and Demircioğlu (2016) used a survey method to determine students’ understanding levels and alternative ideas about gas concepts. According to the results of their research, it was found that the understanding level of the students was about 50%, and they were found to have alternative ideas at important and varying rates. The main reason for this difficulty is that the gas concepts
require a sound understanding of the particulate nature of matter which is not visible and abstract. This situation makes it difficult for the student to understand the concept. Stavy (1990) found that students think that “the gases do not have mass”, and “the gas state of a matter is lighter than its liquid and solid state”. Novick and Nussbaum (1981) and Novick and Nussbaum (1978) found that students believe that there is something between the gas particles such as other gases, dust, and unknown vapors. Water molecules in the gas phase are the largest” (Griffiths and Preston, 1992), “the size of a molecule depends on its temperature” (Lin, Cheng & Lawrenz, 2000). Alternative conceptions are very resistant to ordinary forms of instruction (lectures, note-taking, discovery learning, or simply reading texts) because they are meaningful and logical for the students. In order to be able to correct their alternative ideas, many different methods have been tried on different chemistry topics in the literature. Some of these methods can be listed as; analogy (Türk, Ayas & Karşı, 2010), conceptual change texts (Günay, 2005), POE technique (Sreerekha, 2016), PDEODE strategy (Demircioğlu, 2017), and animations (Al-Balushi, 2017). The POE strategy was developed by White and Gunstone (1992) to uncover individual students’ predictions, and their reasons for making these, about a specific event. Also, this technique supports both constructivist approach and conceptual change model. Research has shown that the POE are a useful teaching technique for determining students’ alternative conceptions, and improving the conceptual understanding of students (Coştu, Ayas, & Niaz, 2012; Kala, Yaman & Ayas, 2012; Kearney, 2004; Kearney et al., 2001).

THE PURPOSE OF THE STUDY

The purpose of the study is to investigate the effect of the activities based on Predict-Observe-Explain (POE) technique on grade 11 students’ conceptual understanding and alternative conceptions of the gases.

1. What are the experimental and control group students’ alternative conceptions about gases both before and after the treatment?

2. Is there a statistically significant difference between the experimental group and the control group in term of students’ conceptual understanding of the gas concept after the treatment?

METHOD

The study used the quasi-experimental method because school authorities in Turkey do not allow the researchers to constitute new classrooms for experimental purposes. A pre-test-post-test non-equivalent groups design, one of research designs of the quasi-experimental method, was selected for this study. Two grade 11 classes at the school where the study was conducted were randomly selected for the study groups. While one of the classes was randomly assigned as experimental group, the other was determined as control group. The experimental group students were instructed by using POE technique while the control group students were taught with the traditional approach. Both groups were taught by the same teacher with over 10 years of teaching experience in chemistry education.

The Sample

The sample for the study consisted of 73 eleventh grade students from two intact classes of Fatih Sultan Mehmet Anatolian high school in Trabzon province of Turkey. One class (N = 36; 25 boys and 11 girls) was assigned as the experimental group (EG) and the other (N=37; 24 boys and 13 girls) was chosen as the control group (CG). The study was conducted during the spring semester of the academic year 2016-2017.

Gases Concept Test (GCT)

GCT consisted of 20 multiple-choice questions was applied to both groups as a pre-test and post-test. Apart from identifying the effectiveness of the POE technique, the GCT enabled us to identify any alternative conceptions about gases. While 2, 6, 9, 10, 11, 14, and 20th questions were developed by
the authors, the other questions were taken from the literature (Demircioğlu, Kurnaz & Erol, 2017; Demirel, 2015; Demirer, 2009; Yıldırım, 2010). Items 11 is given below as an example;

**Item 11:** You're holding three balloons, each of which is inflated with a different gas (oxygen, helium and methane gas) until the same pressure is reached in each balloon. Which of the following statements is correct? \((He=4, O_2=32, CH_4=16)\)

a) The balloons have not equal volumes
b) The most particles are in the balloon filled with oxygen
c) The mass of each balloon is the same
d) The least particles are in the balloon filled with helium
e) The number of particles in the balloons is equal to each other

For content validity, the GCT was examined by a group of experts consisting of two university chemistry educators and two high school chemistry teachers who have been teaching for over thirteen years at the central high school in the city of Trabzon. For validity and reliability, the GCT was piloted with 52 grade 10 students of a school which was not part of the sample. Any items that were not clear were changed to reduce ambiguity. Its reliability coefficient (KR-20) for the pilot study was found to be 0.84, while this value was 0.82 for the real study. The concepts investigated by each item in the GCT are presented in Table 1.

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Item numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>1, 2, 5, 7, 14, 16, 20</td>
</tr>
<tr>
<td>Volume</td>
<td>1, 5, 6, 8, 10, 12, 14, 20</td>
</tr>
<tr>
<td>Ideal Gas-Real Gas</td>
<td>6, 13, 14</td>
</tr>
<tr>
<td>Diffusion</td>
<td>15, 17, 18, 19</td>
</tr>
<tr>
<td>The mole-Pressure</td>
<td>3, 9, 10, 11</td>
</tr>
</tbody>
</table>

**The treatment**

Firstly, the CAT was administered to both groups as the pretest one week before the intervention. In the intervention phase, EG students were taught by the teacher using POE activities for three weeks (6 lesson hours). Eight activities were determined by the researchers from different sources. Activity 4 is given below as an example;

**Activity 4:**

**The used materials:** Erlen, rubber stopper, bent glass tube, container, cold water, and mercury

As in the figure above, place the bent glass tube into the top of the erlen by using the rubber stopper. There is some mercury in the bent glass tube as in the figure. Predict what will happen to the mercury in the tube if the apparatus is placed in a container filled with ice? Write down your predictions.

..................................................................................................................................

**Activity:** Place the apparatus at the figure into a container filled with ice. And then observe the mercury in the glass tube. Write down the results of your observation.

**Observation result:** ........................................................................................................................................

**Compare your prediction to the result of your observation:** .........................................................

As seen from the Activity 4, the POE consists of three steps, Predict, Observe, and Explain. In the Predict step, knowledge about event is given to students and the students are asked to predict the
outcome of this event. In the Observe step, student observes how the event happens. It is important that it constitute a conflict. In the Explain step, the students think about differences between their prediction and observation. If there is a conflict between their prediction and observation, they try to correct it. In a typical instructional sequence, firstly, students were divided into six groups. The worksheet related to the POE activities was handed out to students and they were asked to write down their predictions about the result of event or experiment in the worksheets. Then, while the experiment or event was demonstrated by the teacher, students observed carefully and record the results of their observation. Finally, teacher asked the students to compare their prediction to the results of their observation and to discuss the whole process.

THE RESULTS

In the analysis of the GCT, firstly, the test score of each student in both groups were calculated. For this aim, 1 point is assigned for each correct answer and 0 point is assigned for each incorrect answer. As a result, the maximum score a student can take from the test is 24. The pre-test and post-test scores of the groups were compared with independent t-test to determine whether a statistically significant mean difference existed between two groups. The pre-test results of the experimental and control group are given in the Table 2.

Table 2: The Pre-Test Results of the Experimental and Control Group

<table>
<thead>
<tr>
<th>Item</th>
<th>Group</th>
<th>A %</th>
<th>B %</th>
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</table>
After the treatment, the GCT was applied to both group students to new understanding levels and the ACs they continued to keep. The post-test results of the experimental and control group are given in the Table 4.

<table>
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<tr>
<th>Item no</th>
<th>Group</th>
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<tr>
<td></td>
<td>CG</td>
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<td>EG</td>
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<tr>
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<td>70.2</td>
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<tr>
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<td>22</td>
<td>59.4</td>
<td>1</td>
<td>2.7</td>
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</table>
In the post-tests, percentages of correct answers ranged 19.4% to 94.4% for EG students and from 2.7% to 75.6% for CG students (Table 4). The EG students showed the highest performance (94.4%) in items 4 (about ideal gas) and 19 (about distribution of a gas in a closed container) and the lowest performance in item 11 (this item is given above). On the other hands, the CG students had the highest performance (75.6%) in items 15 (about diffusion) and the lowest performance in item 11 (this item is given above). As seen Table 3, mean score of EG students was 13.42 and standard deviation 3.98 while mean score of CG students was 9.57 and standard deviation 3.14. The t-test results indicated that this mean difference was statistically significant (t(71)= 4.58; p=0.001). This result showed that the EG students were taught with the POE activities were more successful than the CG students instructed with the traditional approach. In other words, it can be said that the POE activities were more affective on students’ understanding of gas concepts than the traditional activities. This result supports to the results of the studies in the literature (Costu, Ayas & Niaz, 2012; Kala, Yaman & Ayas, 2012; Kearney, 2004; Kearney et al., 2001). In the study, Dial et al. (2009) suggested that POE technique improves students’ conceptual development of gases.
The alternative conceptions that students in both groups show in the pre and post test are presented in the Table 5 below.

### Table 5: The Alternative Conceptions that Students in both Groups Show in the Pre- and Post-Test

<table>
<thead>
<tr>
<th>Students' alternative conceptions</th>
<th>Pre-test</th>
<th></th>
<th>Post-test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AC1 There is air between the particles of a pure gas</td>
<td>EG f 16</td>
<td>44.4 f 15</td>
<td>CG f 40.5</td>
<td>5.6 f 8.3</td>
</tr>
<tr>
<td>AC2 When the volume of an ideal gas is increased, the velocity of its molecules increases.</td>
<td>EG f 8</td>
<td>22.2 f 13</td>
<td>CG f 35.1</td>
<td>1 f 2.8</td>
</tr>
<tr>
<td>AC3 Hot air molecules are lighter than cold air molecules</td>
<td>EG f 13</td>
<td>36.1 f 9</td>
<td>CG f 24.3</td>
<td>5 f 13.8</td>
</tr>
<tr>
<td>AC4 Hot air molecules grow and cold air molecules shrink.</td>
<td>EG f 13</td>
<td>36.1 f 11</td>
<td>CG f 29.7</td>
<td>8 f 22.2</td>
</tr>
<tr>
<td>AC5 Two balloons, each of which is filled with the same mass of gas (one balloon contains hydrogen gas, the other balloon contains oxygen gas) have equal volumes.</td>
<td>EG f 9</td>
<td>25 f 4</td>
<td>CG f 10.8</td>
<td>4 f 11.1</td>
</tr>
<tr>
<td>AC6 The gas particles in the balloons are located near the center of the balloon</td>
<td>EG f 2</td>
<td>5.6 f 9</td>
<td>CG f 24.3</td>
<td>7 f 19.4</td>
</tr>
<tr>
<td>AC7 If a gas in the container is heated, the gas particles are collected in one part of the container (below, in the middle, on the edge, above)</td>
<td>EG f 6</td>
<td>16.6 f 7</td>
<td>CG f 18.9</td>
<td>9 f 25.0</td>
</tr>
<tr>
<td>AC8 In a gas mixture in a container, gas molecules with larger mass are collected in the bottom of the container while gas molecules with smaller mass are collected in the top of the container</td>
<td>EG f 10</td>
<td>27.7 f 12</td>
<td>CG f 32.4</td>
<td>7 f 19.4</td>
</tr>
<tr>
<td>AC9 Its weight increases when a gas is heated</td>
<td>EG f 10</td>
<td>27.7 f 7</td>
<td>CG f 18.9</td>
<td>8 f 22.2</td>
</tr>
<tr>
<td>AC10 When the volume of an ideal gas is doubled, the average speed of the molecules doubles.</td>
<td>EG f 8</td>
<td>22.2 f 13</td>
<td>CG f 35.1</td>
<td>1 f 2.8</td>
</tr>
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</table>

As seen Table 5, percentages of alternative conceptions of EG students ranged from 5.6% to 44.4 in pre-test while alternative conceptions of CG students ranged from 10.8% to 40.5%. On the other hands, percentages of alternative conceptions of EG students ranged from 2.8% to 25.0 in post-test while alternative conceptions of CG students ranged from 5.4% to 37.8% (Table 11). In the EG, the percentage values of student alternative conceptions in the Table 11 decreased except for the AC6 and AC7 after the treatment. In the CG, the percentage value of the AC5 did not change, AC2, AC3, and AC10 increased, and the other ACs decreased. Although the pre-conceptions of the students were taken into account in the experimental group, the alternative conceptions of the students were not completely corrected. Some students in EG keep to hold their alternative conceptions even after the treatment (see Table 5). It is emphasized that this situation may also occur in the studies in the literature (Hewson & Hewson, 1983). The reason for this is that the ACs are logical and plausible for the student, they are resistant to change.

### CONCLUSION AND RECOMMENDATION

This study tried to determine the effectiveness of the POE activities on students’ understanding of gas concepts, and in overcoming alternative conceptions for these concepts. Since the main purpose of instruction is to facilitate students integrate new knowledge to their pre-existing knowledge, it could be inferred that the POE activities used in the present study were more effective than the traditional activities, i.e., note-taking and teacher’s explanations. The results of the present study indicated that the POE activities did not attract the attention of some students while attracting more attention of some students. As a result of this, while the POE activities are effective in overcoming some students’
alternative conceptions of the gas concept, they are not effective for some other students. These students in the EG continued to keep their alternative conceptions about gas concept after the treatment. The POE technique, which consists of three steps (predict, observe and explain), requires students to make predictions, observations, and detailed explanations. Consequently, these processes lead the students to think more and to develop some of their scientific process skills.

More studies on the POE technique could be designed about other basic concepts of chemistry to explore students’ alternative conceptions and correct them. Teachers should take into account prior knowledge and alternative ideas of the students as starting points of teaching as they teach new concepts because these ideas influence students’ subsequent learning. Unfortunately, teachers generally adopt the transmission of knowledge as the appropriate approach to teach, without considering students’ prior knowledge. They should use teaching methods that helps the students to question their preconceptions, and motivates them to learn, and aim to correct alternative ideas such as POE technique, 5Es model, and so on. The teaching models and techniques aiming at conceptual change and their applications should be taught to student teachers and chemistry teachers. In addition to the available materials, teaching materials based on POE technique that may help to remedy students’ alternative conceptions should be devised and presented to teachers’ usage.

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REFERENCES


THE EFFECT OF DIGITAL STORYTELLING PROJECT ON FINE ARTS HIGH SCHOOL
STUDENTS’ TEAMWORK SKILLS

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Abstract
Digital storytelling is one of the pedagogical approaches that use new technologies and can provide
students in deep, effective learning environment. In this study, the purpose was to explore the
function of digital storytelling project in Fine Arts high school students’ teamwork skills along with
their communication skills. This study is important by being one of the few sources in Turkish
literature using a digital storytelling approach in high school setting. Digital storytelling is also
proposed as one of the educational tools to be used for technology integration into courses. The
generalization was not the main purpose of the study; therefore it was confined to 19 high school
students. The findings from this study indicated that digital storytelling has positive effect on students’
teamwork and communication skills in this sample.

Keywords: Digital storytelling, teamwork skills, communication skills.

INTRODUCTION

Digital tools such as digital cameras, smart boards, software tools, computers and other technologies
make possible to integrate technology into classrooms and enable the creation of digital stories easily.
As a result, we have started to see storytelling or digital storytelling (in other words digital narrative)
as a way of instructional method in education.

Digital storytelling has been defined as a mix of traditional storytelling and multimedia technology
(Normann, 2011) to share information (Xu, Park, & Baek, 2011). Additionally, digital storytelling is
accepted as one of the educational tools to be used for technology integration in education (Robin,
2008). Storytelling can increase students’ critical thinking, academic performance (Yang & Wu, 2012),
and ownership of learning (Dupain & Maguire, 2005); therefore it can be an influential tool for
education. Furthermore, according to the literature, enhancing the self-expression of children (Craig,
Hull, Haggart, & Crowder, 2001), motivation, ICT skills (Sadik, 2008) and 21st century skills (Dogan &
Robin, 2008), increasing student engagement, (Smeda, Dakich, & Sharda, 2012), and problem solving
skills (Chung, 2007), advancing the relationship of students and peer learning (Alterio, 2003) can be
provided through the integration of digital storytelling into curriculum as a pedagogical method. In
particular, teamwork skills along with communication skills can be developed by using digital
storytelling in the instruction of the courses (Yuksel, Robin & McNeil, 2011). Therefore, it has been
defined as a curriculum innovation due to enhancing students’ curiosity and motivation (Hathorn,
2005) and as “an effective learning environment for fostering collaboration and co-construction of
meaning” (Yang & Wu, 2012, p. 350) in education. Due to the valuable benefits of digital storytelling
on students, in this research, it was intended to explore the function of digital storytelling project on
Fine Arts high school students’ teamwork skills by trying to find out answers to the below questions;
How can digital storytelling project enhance students’ teamwork skills?
How does teamwork affect the communication skills of the students?

Kocaman Karaoglu (2015) has pointed out that recently, there has been an inclination making researches about digital storytelling in Turkey, however only three studies (Kahraman, 2013; Kaya, 2014; Kotluk & Kocakaya, 2015) have been found about digital storytelling in high school educational settings. Although there were some studies looking for high school students’ (Kotluk & Kocakaya, 2015) and primary school students’ (Karakoyun, 2014) teamwork and communication skills, the results were general, these researches were not built on examining specifically these skills and were not realized particularly in Fine Arts high school which specialized in art and music education. Additionally in Turkey, the Turkish Ministry of Education has aimed to use information technology effectively in classrooms, however it is noticed that teachers generally struggle to incorporate computer applications into their instructional practices to increase learning (Demirer, 2013). According to Demirer (2013), new pedagogical approaches and models are needed for technology integration at schools and using digital storytelling in education which improves the learning and teaching (Sadik, 2008), can be one of the technological activities in teaching (Karakoyun, 2014).

This research is important to examine the effect of digital storytelling on students of one of the Fine Arts high schools where teachers generally use traditional methods of instruction; there is less technological usage in courses and mostly individual study is preferred. Furthermore, we propose digital storytelling as one of the educational tools to be used for technology integration into classrooms by providing a perspective on the implementation of digital storytelling and its valuable educational benefits.

METHOD

To understand the digital storytelling project extensively, in this research, a case study which has a pilot and main projects for analysis was preferred to research and focus on an issue. According to Creswell (2009), a case study explores an event, activity, process, a document or subjects in details and Yıldırım and Simsek (2003) stated that a case study design includes when, why and how questions in a situation to examine the case deeply. In order to achieve a complete understanding of this project, the research methodology was designed to utilize qualitative research methods in which data was obtained from researcher notes based on observations, students’ diaries kept for the project, and semi-structured interviews with students. The result of this research was based on the analysis of these documents. The generalization was not the main purpose of the study; therefore it was confined to 19 high school students.

Participants
The participants of this study include a total of 19 high school students (Table 1) of one of the Fine Arts high school in Turkey and they entered these projects voluntarily after the introduction of the project in their schools. In pilot project, while there were 9 students (from 10. 11. and 12. grade), in the main one, 10 students have participated to the project (from 9. and 10. grade). According to McMillan (2004), in case study, the small number of participants allows the researchers to make a better description of the research topic, therefore each project was limited to maximum 10 students.

Table 1: The Number and Genders of Students in the Projects

<table>
<thead>
<tr>
<th></th>
<th>Pilot Project</th>
<th>Main Project</th>
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<tbody>
<tr>
<td>Girls</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Boys</td>
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</tr>
<tr>
<td>Total</td>
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<td>10</td>
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</table>
Context of the Study

This research was about the digital storytelling project that was conducted in one of the Fine Arts high school in Turkey from October 2013 to May 2015 as a free time activity. The project was led by a research assistant who specializes in digital storytelling and a specialist whose major is industrial design. In the project, while one of the researchers guided to the project, the other one collected and dealt with the data. Two digital storytelling projects were realized. The first one was the pilot project and lasted approximately 12 weeks. After the first project, an evaluation was made and the second project was designed with a strict schedule and has continued for 10 weeks (Figure 1).

In both of the projects, the groups were divided into task divisions, these are; scenario, storyboard, design process including character design and background design, animation and montage including technical planning, generic (this group was formed only in the main project) and music design with storytelling and background music. Groups were formed and task sharing was done by students. Furthermore, some of the students were involved in different groups at the same time, since the collaborative nature of digital storytelling process does not have strict rules inside; it is flexible in terms of teams. In addition, they did not just interact within the group; there were also an interaction with other groups. Even though some groups had only 1 student, all of the decisions were made as a whole. Besides, due to task sharing instead of an individual work on the whole project, all of the students created one digital story altogether in each project. In addition, they met regularly once a week and in these meetings, students shared what they had done and for the next stages what they will do with all of the students. The one of the researchers tried to guide them in their work and gave feedback about their works. She also gave a brief about what is due for the next week in these meetings. The number of the students in each group was presented as below in each project (Table 2);

<table>
<thead>
<tr>
<th>Name of the Groups</th>
<th>Number of the Students in Pilot Project</th>
<th>Number of the Students in Main Project</th>
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<td>DESIGN PROCESS</td>
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</tr>
<tr>
<td>Character Design</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Background Design</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ANIMATION</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>MONTAGE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Technical Planning 1 1
Music Design
  Storytelling 2 2
  Background Music 1 1
  Generic 1

### Implementation of Digital Storytelling

First project was a twelve week pilot project which was made in 2013-2014 fall semester. The explanation of all of the weeks of the project is presented in Table 3.

Table 3: The Process of the Pilot Project

<table>
<thead>
<tr>
<th>Week</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1 & 2. week | The digital storytelling was introduced to the students by showing examples. Furthermore, the project and its stages were explained comprehensively.  
| 3 & 4. week | The groups were formed according to the students’ interest; the main theme was determined by brainstorming in the class and the scenario and the design process group started to work.  
| 5. week | While scenarists were working, the research about visuals was presented.  
| 6. week | The scenarists presented the scenario to the class for their comments. According to the comments, changes were made and they reached the last version of the scenario. The storyboard designers were told to work on the scenario for the next week.  
| 7. week | The storyboard designers presented their works to the class and final versions of the storyboards were decided. Since the digital storytelling visual outline were made, the character designers were told to start working.  
| 8. week | The designs of the characters were started under the control of the scenarists. At that time, the students in the montage group tried to find programs that support digital storytelling technically. Furthermore, the students in the music group started to search for music.  
| 9. week | While the character designs were continuing, the animation group started to work. The programs related to montage were installed and they were tested by the technical planning group. The dialogues in digital storytelling were created by the scenarists.  
| 10. week | The researches related to the programs and the design processes of the characters were continued. The character designers continuously took feedback from teammates and the project manager.  
| 11. week | The character design and the animation process were finished and the information about the animation was given to the students who were in the montage group (including both technical planning and music). Therefore, the montage group started to work.  
| 12. week | Visuals were edited in one of the computer program and the music was selected from the archives that students created. The recording for storytelling was made and the effect was applied to the recorded voice. At the end, all of the materials were imported to another computer program to compose the animation.  

After the pilot project, an evaluation was made according to students’ feedback and researcher notes; and the researchers found out that more time was spent for scenario than expected and the schedule of the project could not be managed well due to students’ other courses. Therefore, the main project which was realized in 2014-2015 spring semester was designed with a strict schedule and continued for 10 weeks. The main project has followed almost the same steps of the pilot one, only addition was made to the last part for creating generic. Although these steps are not the only procedures to implement digital storytelling, they can be used by teachers in their classrooms to integrate or use technology for creating digital storytelling. Furthermore, as mentioned before, students in different groups have different tasks; therefore, the above explanations in Table 3 can explain the students’ roles in these projects.

Data Collection
In both of the projects, for the reliability of the research, researchers collected data in different ways. They have taken notes continuously and students have kept diaries about project by using WhatsApp application. Besides, semi-structured interviews were made with students at the end of each project to assess the project’s strengths, weaknesses and the evaluation of teamwork. In this research, after a year passed, semi-structured interviews were also made with 19 students again to get richer details of students’ experiences about digital storytelling studies’ impact on teamwork skills for verifying the data collected during the project. Before the projects and the interviews, all participants were acknowledged about the aim of the study and consent forms were obtained from the interviewees. All interviews were audio-recorded by the researcher after taken the participants’ permission. In the interviews, there are questions about the evaluation of the digital storytelling process, the pros and cons of the project, the relationship of the students with each other in terms of teamworking, communication, and their suggestions related to the project.

Data Analysis
The data that were obtained in the research (pilot and main projects) were analyzed through thematic analysis based on qualitative research and the data were rechecked several times by researchers in this stage. To analyze the qualitative data, all the data (interviews, observations, students’ diaries) were prepared, organized and converted into text data in computer. After that, an analysis of the data was made by reading and dividing the data into parts. Then the data was explored through the process of coding for the general picture of the information and similar codes were grouped to reach themes. Additionally, by using a schema, the themes have been layered to show sub-themes under a main theme to represent the findings. Finally, the findings were interpreted through the cause and effect relations and it was supported by direct quotes from the interview data. The accuracy of the findings was made with cross-checking the codes that were obtained by each researcher. As a result, the findings have been discussed and compared with the existing literature (Creswell, 2012) for the reliability of the research. The data were examined in the framework of ‘provisional codes’ which are the ‘start list’ of codes prior to fieldwork’ (Miles and Huberman, 1994, p. 58) by taking into consideration the research questions. Within the recommendation of Miles and Huberman (1994), the provisional codes (teamwork and communication skills) were determined, but the sub-themes were emerged after the analysis of the qualitative data obtained in the research.

FINDINGS
Under teamwork skills, seven main themes were detected from this study, which are; responsibility, self-confidence & motivation, peer feedback & reflection, individual growth professionally, mutual trust, empathy, and communication having three sub-themes including social interaction, decision-making, problem solving. In addition, four themes, which are responsibility, time management, social interaction and self-confidence, were found related to the problems based on students’ views about the project. While giving direct quotes of the students, instead of using names, students were entitled as S1, S2, S3,... etc. in this research.
Findings Related to Students' Views about Teamwork and Communication Skills

This study was investigated from the point of "teamwork skills" and "communication skills". In this framework, seven sub-themes for "teamwork skills" which are responsibility, self-confidence & motivation, peer feedback & reflection, individual growth professionally, empathy, mutual trust and communication having three sub-themes including social interaction, decision-making, problem solving (Figure 2) have been determined. The findings of this research indicated that teamwork skills (Table 4) and communication skills (Table 5) were developed between students as a result of the digital storytelling project in this framework.

Table 4: Students’ Views about Teamwork Skills

<table>
<thead>
<tr>
<th>Sub-theme</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility</td>
<td>8</td>
<td>42.1</td>
</tr>
<tr>
<td>Self-confidence &amp; Motivation</td>
<td>8</td>
<td>42.1</td>
</tr>
<tr>
<td>Peer feedback &amp; Reflection</td>
<td>9</td>
<td>47.3</td>
</tr>
<tr>
<td>Individual Growth Professionally</td>
<td>13</td>
<td>68.4</td>
</tr>
<tr>
<td>Empathy</td>
<td>9</td>
<td>47.3</td>
</tr>
<tr>
<td>Mutual Trust</td>
<td>9</td>
<td>47.3</td>
</tr>
<tr>
<td><strong>Total number of students</strong></td>
<td>19</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5: Students’ Views about Communication Skills

<table>
<thead>
<tr>
<th>Sub-theme</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Interaction</td>
<td>15</td>
<td>78.9</td>
</tr>
<tr>
<td>Decision-making</td>
<td>15</td>
<td>78.9</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>12</td>
<td>63.2</td>
</tr>
<tr>
<td><strong>Total number of students</strong></td>
<td>19</td>
<td>100</td>
</tr>
</tbody>
</table>

Under the teamwork main theme, one of the students (S1) stated her comment as follows "I would not like to make the project on my own. In group work, we could produce clearer and multiple ideas. I could not show this success myself. Working as a team was productive. There were multiple ideas and critiques. I liked teamwork.” The other student (S2) made her comment regarding teamwork as follows; ”I found teamwork good. Instead of working alone, working as a group is logical, since there are multiple ideas. Somebody can say something else and it all becomes better.” Another one (S11) found teamworking as a fun process: “A lot of people mean a lot of ideas and working as a group means working with fun and the job made with fun always be fine”. Another student (S12) also referenced his appreciation to teamwork as follows; “It is better to share your victory with others rather than alone”. One of the students (S4) also stated her desire about working as a team with the sentences; “I would like to work as a group, since you can see your deficiencies. You can find out what you want to improve in yourself. This is very good, I like it.” While student mentioned about her satisfaction from teamwork, she also pointed out another sub-theme, individual growth professionally.

Under the sub-theme responsibility, one of the students (S3) stated his feeling of responsibility with the sentences; “Responsibility! Succeed in something increased my responsibility. I mean as a group”. In addition, another student (S8) made his comment about responsibility and his dedication to the teamwork and his friends as follows; “While working in a group, you cannot leave something in the middle. There is a feeling of responsibility and you do not feel alone and believe that you will be succesfull.” This statement also emphasize that the feeling of responsibility resulted from mutual trust. Under the sub-theme of peer feedback & reflection, one of the students (S4) mentioned how this interaction happened as follows; “I was in my senior year, but the others were in their second and third grade. I helped them in their drawings and I also learnt from them”. Another one (S14) pointed out this situation with the sentences; “One of the group members could not draw his character properly; he had a different point of view from the others, so this created problem in his drawings. We gave him feedback and told him what is wrong, and then he changed his drawings”.

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Developing teamwork skills also referred to improving communication skills in this project. Most of the students stated that the communication between the groups was good. From the point of social interaction, while one of the students (S4) told her view with the sentence “I never had a problem in communication”, another one (S6) supported this view as follows “This helped me to socialize more.” Besides, another one (S10) told that; “Even though we did not have a meeting for the project, when we found an idea, we took others’ decisions about it by using WhatsApp or making face to face meeting”. They also pointed out that good communication resulted in idea sharing, social interaction and mutual assistance. In the communication theme, decision-making sub-theme was referenced several times by students. One of them stated (S2) that “We did not have a communication problem in the group. Everybody helped each other anyway. We took our decisions as a group.” Another one (S5) said “We took our decision as a group, for instance, as a group we decided who would make the voice recording.” Another one stated (S7) her views about decision-making as follows “In teamwork, everybody took support from each other, sharing ideas was important since different things came up.” One of the students’ statements (S13) also valued decision-making as follows; “Although sometimes your own ideas might have been of secondary importance, it could be better for the result instead of following your own ones”. Additionally, under the sub-theme of self-confidence, one of the students (S5) said “Group working improved my self-confidence.” Additionally, according to our observations, teamwork also made some students more active and involved in the project. In other words, it increased their self-confidence, while they were withdrawn at first. This can also be related making their own choices, expressing and sharing their ideas freely in the project.

Furthermore, our observations indicated that, one of the major problems in the project was that none of the students knew digital storytelling terminology at first. For example, some of the drawings could not be transferred to the computer program or they created problems in the stream of the animation. In that point, as a solution, these hand drawings had to be made on computer, or were tried to be combined with computer drawings or as a last option, they had to discard these drawings. Therefore, owners of these works tried to understand each other’s techniques by making empathy to find a solution to these problems. As a result, they overcame these problems by negotiating the problem. Additionally, one of the students mentioned about his teammate who has a hearing impairment; he helped him to understand what he should do in the project and consequently his teammate was involved more in the project. It is obvious that, students tried to solve their group members’ problems by creating empathy with them. Therefore, it can be stated that under the sub-theme of problem solving, while they were trying to solve the problems, they tried to make empathy, which is another sub-theme in this project, with team members to understand the issue properly.

Within the context of the findings obtained from this study, it can be stated that from many aspects, digital storytelling project affected students positively on their teamwork and communication skills.
interaction have been determined in this part. In this framework, it was tried to look for whether these problems were solved or how it was solved within the process.

Table 6: Problems Based on Students' Views about the Project

<table>
<thead>
<tr>
<th></th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility</td>
<td>3</td>
<td>15.8</td>
</tr>
<tr>
<td>Self-confidence</td>
<td>3</td>
<td>15.8</td>
</tr>
<tr>
<td>Time Management</td>
<td>7</td>
<td>36.8</td>
</tr>
<tr>
<td>Social Interaction</td>
<td>3</td>
<td>15.8</td>
</tr>
<tr>
<td>Total number of students</td>
<td>19</td>
<td>100</td>
</tr>
</tbody>
</table>

Under the sub-theme of responsibility, students had problems with some team members. Within the framework of this sub-theme, one of the students (S12) in the pilot project said "At first, I could not know what I will do. Therefore, I demoralized, since my friends were drawing and I was indecisive about what I do. However, I left no job unfinished." With this sentence, she confessed about her less contribution at first, however within the time; she handled this issue and finished her duty. It was also observed that, while there was a problem about the responsibility of one of the group members, the others tried to solve it by negotiating it with this person, since they felt to be compatible with each other. Another one (S13) supported this observation and stated the feeling of her responsibility to the teamwork with the sentence "We felt obliged to be in harmony with each other". Under the sub-theme of social interaction, one of the students (S9) stated his concern as follows "My concern was that I did not know anybody and I thought whether I have difficulties in that point. However, I did not have any problems and I started to be active." Additionally, under the sub-theme self-confidence, one of the students (S4) stated that "I was afraid at first, but after a few weeks later, everything went well. We tried to figure out the project." It can be concluded that, after warming up to the project and spending time together, students overcame their concerns related to self-confidence, responsibility and social interaction. The problem of time management was encountered mostly in the pilot project. Writing the scenario lasted long and the courses of some of the students from different grades were overlapped. One of the students (S4) said "We had difficulties to come together since our course hours were overlapped." Due to time management problems, after the pilot project, strict rules have been taken for timeline of the project and the students were obliged to obey these rules. However, there was still time management problems in the main project, therefore, the distribution of responsibilities, communication and interaction of the students in the groups were decided to be managed well to overcome this issue. The overall findings indicated that students managed to overcome these problems by negotiating them together; they sometimes asked assistance of the project manager to handle the issue and also, spending time together eliminated the problems after a while. As a result, while in the beginning there were some concerns and problems, within the process, due to developing mutual trust, the feeling of responsibility to the group members and the assistance of the project manager, students overcame these issues.

CONCLUSION AND DISCUSSION

In this research, it was intended to explore the function of digital storytelling project in Fine Arts high school students’ teamwork skills along with their communication skills. The findings indicated that in this project, implementing digital storytelling improved teamworking skills from many aspects. It developed mutual trust between team members and resulted in responsibility to the group members and project. It was also indicated that as a result of this project, students developed themselves by seeing their mistakes and learning from other members. Furthermore, this project assisted students in terms of reflecting their ideas to other members to reach a better solution. They felt free to express themselves and share their ideas; these increased their motivation. Additionally, due to being a contributor, they really enjoyed from the project and that caused more involvement in the process and more satisfaction from team working. Furthermore, due to involving and managing the digital storytelling project by their own preferences, students were found more active and self-confident in
the process. Students also stated the value of teamwork in general, noting that it made the project more meaningful, joyful and productive. These findings are also supported by the literature that digital storytelling is thought to develop team working skills (Hafner & Miller, 2011) and good relationships with other students (Alterio, 2003). Increased motivation (Sadik, 2008) and student engagement, (Smeda, Dakich, & Sharda, 2012), more involvement in the task (Dollar Kesli, & Tolu Tekiner, 2015), peer feedback (Alterio, 2003) and reflection (Craig, Hull, Haggart, & Crowder, 2001) are also identified in the literature. Overall, team working enhanced students’ skills and contributed to their educational life in a positive way in this sample. According to our findings, implementing digital storytelling also improved students’ communication skills. There was a good social interaction between students due to sharing their thoughts freely and they started to give importance other people’ ideas. They made an effort for better communication so that, they could state and defend their ideas easily. The increased communication resulted in taking decisions and solving problems together. Additionally, this social interaction developed the feeling of empathy between students. These findings are also supported by the literature that students develop their communication skills (Robin, 2008) in digital storytelling activities. The overall findings about sharing ideas, mutual assistance, asking questions, expressing ideas freely indicated that students developed their communication skills in this project.

This research is significant by being one of the few written sources in Turkish literature using a digital storytelling approach in high school education. Furthermore, by providing a perspective on the implementation of digital storytelling and its valuable educational benefits, we propose digital storytelling as one of the educational tools to be used for technology integration into classrooms and to provide interaction between digital media and students; consequently an addition is made to Turkish literature about technology integration to an instructional environment by using digital storytelling. Therefore, this study may arouse interest among teachers about using digital storytelling for the integration of technology into their curriculums. However, in this research, there were some limitations. The projects meetings were made as a free time activity not as a high school course, and in the pilot project, the programs of some of the students overlapped. Therefore, this sometimes caused problems in students’ attendance and motivation and in the pilot project; the application period took longer time. Despite these limitations, it was concluded that in this project, working in a digital storytelling project helped students to cultivate a deeper sense of interest and engagement. As a result, the findings from this study indicated that digital storytelling has positive effect on Fine Arts high school students’ teamwork and communication skills.

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**REFERENCES**


THE EFFECT OF METACOGNITION INSTRUCTION ON SOLVING MATHEMATICAL PROBLEMS IN SCIENCE LESSONS

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Abstract
This study examines the metacognitive instruction’s effect on solving mathematical problems in science concepts. Metacognitive skills are the strategies on solving mathematical problems, reading, conceptualizing, and writing. In this study, Mayer’s four types of processes that translation, integration, planning-monitoring, and solution execution were administered as an instructional practice to 27 6th grade students in a science class. The pre and post test (Speed of Sound Achievement Test) were conducted to control and experimenter groups. The results showed that there was no significant difference between pre-test scores of experimental and control groups, however there was a significant difference between post and pre test scores of experimental group. Additionally, it was seen that students’ work were improved and the time spent for each problem was decreased. Some students did not show improvement during the implementation, they were additionally interviewed by the experimenter. They expressed that because of the “Motivational” occasions; they did not show improvement.

Keywords: Cognition, Metacognition, Motivation.

INTRODUCTION

Education and Cognition-Metacognition-Motivation
Generally educational activities are attributed to cognitive processes. According to cognitive/rationalist perception, understanding concepts in different subject domains require cognitive activities; such as reasoning, conceptualizing, solving mathematical problems, planning, and interpreting (Greeno, Collin, Resnick, 1996). However cognitive processes are not always seen as a direct mean of success. For example a student can solve a mathematical problem, after he learns about it. This means he puts the work cognitive abilities, in other words he makes a success of retention test. However when he is asked another mathematical problem which can be solved by integrating information what he already knows, he may not be able to solve it, because he has not seen this topic yet. This means, he can retain but not transfer the knowledge (Mayer, 1996). Such a phenomenon can be attributed to metacognition strategies, one can handle. Beside the cognitive and metacognitive processes, motivational situations are also important variable to solve mathematical concepts. Motivational aspect of the learning is an old and long theoretical framework that there is a huge of studies deep motive. Mayer (1998) categorized the motivational effect on learning by learner’s interest, self-efficacy, and attributions. According to Dewey (1913), a learner who has a “will” is probably come up with a permanent learning outcome, rather than an unwilling learner. When learner feels that s/he can do a task, or motivated externally (i.e. by an instructor) s/he probably learns the subject matter (Bandura, 1977). Finally, according to attribution theory, a learner can become more successful or the exact opposite when s/he attributes the success and failure to work or ability.

Metacognition and Mathematical Problem Solving
Problem solving in mathematics is process of the finding ways to discover unknown elements from the given knowledge by using solver’s strategies. In order to find the way to process, solver should
transfer the knowledge, instead the use of direct elements. Doing so is not only the work of cognitive abilities and motivation, but also sophisticated way of thinking. Solver should know how to organize knowledge and find a way to go ahead. At the beginning metacognitional activities were attributed to only memory and reading, solving mathematical problems was seen as a work interest in cognitional abilities at the point of solving problem. However such a sophisticated thinking can be deepen by metacognitional strategies.

Flavell (1976) defines that “metacognition refers to one’s knowledge concerning one’s own cognitive processes and products or anything related to them, e.g., the learning-relevant properties of information or data”, and “Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or objective.”

Pólya (1973), Fernandez, Hadaway and Wilson (1994), and Mayer (1985) developed specialized methods evoking one’s problem solving ability by metacogtional strategies. These three methods are similar in the process, however cited in different phrases.

Mayer’s Method for Solving Problem
Mayer’s model for solving mathematical problems constitutes translation, integration, planning-monitoring, and solution execution.

Translation refers to express the words operationally in a problem, what certain words mean to solver? Are there any unknown words in the problem? Here is an example from this research’s study context.

Question: A child shouts against to a mountain, and hears his sound after 4 seconds. If sound gets on the air with a speed of 344 m/s; what is the distance between child and mountain?

In order to solve this problem only the knowledge of “distance equals to elapsed time multiplied by speed” is not enough. Here, solver should not treat “mountain” word as “elevation of the earth’s surface”; he should arrive at a conclusion that in that question mountain means a surface that sound is echoed.

Integration refers to join what the solver knows already, when a solver has a broader schematic knowledge and practice, he can integrate well. In this question solver should know that sound will be echoed from the mountain, since the sound goes to mountain and turns back; elapsed time is actually 2 second (4/2=2). Consequently he should multiply 344 m/s by 2 second, not 4 second.

Planning-Monitoring refers to organize the knowledge and extract the sub-problems in order to make a decision about how to solve it. For example, in this question, there are two knowledge hindered. First, solver should know that from the mountain the sound will be echoed. Second, solver should know that distance equals the elapsed time multiplied by speed of sound.

Solution execution refers to making calculations according to plan. Making true operations is crucial. For example, in this question; “344 m/s x 2 s = 688 m” is the expected answer.

Solving Mathematical Problems in Science Concepts
Sometimes, in science lessons, mathematical relations are used. While a lab section, or test-and-drill exercises a student needs to put mathematical practices on. In Turkey middle school science curriculum, science concepts have been simplified; that is difficult mathematical problems were eliminated; nevertheless, there are main mathematical relations left.

- 5th grade’s mathematics ability requiring units: “Kuvvetin Büyüklüğünün Ölçülmesi” (Measurement of Force Magnitude)
6th grade's mathematics ability requiring units: “Kuvvet ve Hareket” (Force and Motion), “Maddenin Tanecikli Yapısı” (The Particle Structure of Matter), “Işık ve Ses” (Light and Sound), “Elektrin Iletimi” (Transmission of Electricity)


8th grade’s mathematics ability requiring units: “Basit Makineler” (Simple Machines), “Maddenin Yapısı ve Özellikleri” (Structure of Matter and Properties), “Işık ve Ses” (Light and Sound), “Maddenin Hâlleri ve Isı” (Phases of Matter and Heat)

Purpose of the Study
The purpose of the present study was to see the effect of the Mayer’s metacognition instruction for solving mathematical problems in science lesson. Hence major research questions were these: (1) What is the effect of metacognitive instruction on middle school students’ mathematics achievement? and (2) Does students spend less time for each exercises during the implementation (3) What are the opinions of the non-performed students during the implementation.

METHOD

The Sample and Design of Study
This study addresses the needs of middle school students by using metacognitional instruction for solving mathematical problems in science lesson. The sample included 19 female and 27 male 6th grade students. Because of the school structure, all female students were in same class, called Class-B; and all the male students were in same class, called Class-A. The experimenter adopted a quasi-experimental design with two groups pre-test/post-test (Cohen, Manion, and Morrison 2011) to investigate the effectiveness of a repertoire of interventions to enhance middle school students’ metacognitive capabilities in solving mathematical problems in science lesson. Same teacher instructed science lesson to both classes. Teacher was also the experimenter of this study. Since the school population was not much enough; only for one class, the metacognitional instruction was applied. The Class B was chosen to be the control group (N=19); and the Class A (N=27) was chosen to be the experimenter group.

Procedure
The experimenter spent two weeks (8 lesson hours) to implantation of the study to the experimenter group by class activities. The control group used the traditional approach focusing on students’ getting the right answers.

Table 1: Time-and-Motion Log

<table>
<thead>
<tr>
<th>Time (min.)</th>
<th>Activity</th>
<th>Time (min.)</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>What is Metacognition? (discussion)</td>
<td>10</td>
<td>Regulation and warm up class</td>
</tr>
<tr>
<td>40</td>
<td>Pre-test (Speed of Sound Achievement Test)</td>
<td>10</td>
<td>Students’ answer to 2nd problem was controlled by teacher.</td>
</tr>
<tr>
<td>10</td>
<td>Regulation and warm up class</td>
<td>15</td>
<td>3rd problem (Metacognitive way)</td>
</tr>
<tr>
<td>10</td>
<td>Problem Solving question (Non-metacognitive way)</td>
<td>10</td>
<td>Students’ answer to 3rd problem was controlled by teacher.</td>
</tr>
<tr>
<td>30</td>
<td>1st problem (Metacognitive way)</td>
<td>5</td>
<td>Regulation and warm up class</td>
</tr>
<tr>
<td>5</td>
<td>Regulation and warm up class</td>
<td>10</td>
<td>4th problem (Metacognitive way)</td>
</tr>
<tr>
<td>15</td>
<td>Students’ answer to 1st problem was controlled by teacher</td>
<td>10</td>
<td>Students’ answer to 3rd problem was controlled by teacher.</td>
</tr>
<tr>
<td>20</td>
<td>2nd problem (Metacognitive way)</td>
<td>40</td>
<td>Post-test (Speed of Sound Achievement Test)</td>
</tr>
</tbody>
</table>
An example from the experimenter group is following:

Question:………. The car gives 1 hour break…….
Student: Here, break means, the driver does not go. So I should reduce 1 hour from the total elapsed time.

**Speed of Sound Achievement Test (SSAT)**

The implementation was applied to the control and experimenter group (6th graders) when had not learnt the speed of sound concepts yet. However they had learnt how they can calculate the speed in general. Also students knew what the echo of sound is. Experimenter decided to develop 5 open ended question in Turkish (Appendix-A). After forming the questions, a Turkish teacher revised the test in terms of linguistic grammar, and a math and a science teacher revised the test in terms of knowledge accuracy. Thus SSAT was assumed as valid. After then, the answer key was formed by the experimenter. Each question was valued as 20 points; each error of computing reduced the 5 points from the total points (Appendix-A).

For the reliability of a test, the most commonly used statistic is Cronbach’s coefficient alpha. While different levels of reliability are required, depending on the nature and purpose of the scale, Nunnally (1978) recommends a minimum level of .7 (Pallant, 2007). So the Cronbach’s coefficient alpha was calculated. In the current study, according to pre-test scores the Cronbach alpha coefficient was .71; and according to post-test scores the Cronbach alpha coefficient was .85. Hence the SSAT was assumed as reliable.

**RESULTS**

**The Independent Sample t-test (Comparing Pre-Test scores)**

An independent-sample t-test was conducted to compare the pre- SSAT scores for experimental (Class-A) and control (Class-B) groups. The significant figure is larger than .05 There was no significant difference in scores for experimental group \((M = 35.00, SD = 20.28)\) and control group \((M = 15.83, SD = 18.19; t (42) = 1.92, p = .06, two-tailed)\)(Table 2). Consequently the groups are the same (equal variance assumed).

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Means</th>
<th>Test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F</strong></td>
<td><strong>Sig.</strong></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>1.150</td>
</tr>
<tr>
<td>Qsum</td>
<td>Equal variances not assumed</td>
</tr>
</tbody>
</table>

**The Paired Sample t-test (Comparing experimental group’s pre and post SSAT scores)**

A paired-sample t-test was conducted to evaluate the impact of the intervention on students’ scores on the SSAT. There was a statistically significant increase in SSAT scores from pre-test \((M = 35.00, SD = 20.28)\) to post-test \((M = 56.09, SD = 30.26); t (23) = 4.05, p < .005 \) (two-tailed). The eta squared statistic (.43) indicated a large effect size.
Table 3: Paired sample t-test of experimental group’s pre-post scores

<table>
<thead>
<tr>
<th>Sex</th>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boy</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>Std. Error Mean</td>
<td>95% Confidence Interval of the Difference</td>
</tr>
<tr>
<td>Pair</td>
<td>Qsum</td>
<td>-21.09</td>
<td>24.998</td>
<td>5.212</td>
</tr>
</tbody>
</table>

Time Elapsed For Exercises
A total of four problems were asked students to solve. For each problems, students were expected to go through four stages of Mayer. Students in general solved the first problem in 30 minutes, then students solved second, third and forth problems in respectively in 20, 15, and 10 minutes. From that, it can be inferred as the elapsed time for solving the problems decreased in the length of time.

The Low Performing Students’ Attitudes toward Metacognitive Instruction
Students in general were willing to fill all stages of Mayer Metacognition instruction, however some students did not process, either they filled one stage, or they filled none. A qualitative research was designed. Experimenter conducted an interview with three students, the answers were coded and the frequencies were given following.

1. How do you feel in mathematics?
Table 4: Frequencies to “How do you feel in mathematics?” question

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>It was Hard</td>
<td>2</td>
<td>66,7</td>
<td>66,7</td>
</tr>
<tr>
<td>little succes</td>
<td>1</td>
<td>33,3</td>
<td>33,3</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>100,0</td>
<td>100,0</td>
</tr>
</tbody>
</table>

According to students’ response; 66,7% of students found mathematics “difficult” and 33,3% of students felt little success in mathematics.

2. How do you feel seeing a mathematics question in science lesson?
Table 5: Frequencies to “How do you feel seeing a mathematics question in science lesson?” question

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>2</td>
<td>66,7</td>
<td>66,7</td>
</tr>
<tr>
<td>Weird</td>
<td>1</td>
<td>33,3</td>
<td>33,3</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>100,0</td>
<td>100,0</td>
</tr>
</tbody>
</table>

According to students’ response; 66,7% of students expressed that seeing a mathematics problem in science lesson “normal” and 33,3% of students expressed that it is “weird”.

3. If it Was a Test From Another Discipline, What Do You Do?
Table 6: Frequencies to “If it Was a Test From Another Discipline, What Do You Do?” question

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>I give empty</td>
<td>2</td>
<td>66,7</td>
<td>66,7</td>
</tr>
<tr>
<td>I did not give empty</td>
<td>1</td>
<td>33,3</td>
<td>33,3</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>100,0</td>
<td>100,0</td>
</tr>
</tbody>
</table>

According to students’ response; 66,7% of students expressed that they again give no work and 33,3% of students expressed that i do some work.
4. What is the Main Cause that you did not Complete the Work?

Table 7: Frequencies to "What is the Main Cause that you did not Complete the Work?" question

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>i did not understand</td>
<td>2</td>
<td>66,7</td>
<td>66,7</td>
<td>66,7</td>
</tr>
<tr>
<td>boredom</td>
<td>1</td>
<td>33,3</td>
<td>33,3</td>
<td>100,0</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>100,0</td>
<td>100,0</td>
<td></td>
</tr>
</tbody>
</table>

According to students’ response; 66,7% of students expressed that they i did not understand technic and 33,3% of students expressed that i some just felt bored.

DISCUSSION

As the previous studies revealed the metacognitional strategies carried on the instructional designs, mathematical problems were solved by students in success. Same result was obtained in also this study. The students who were subjected to metacognitional strategies achieved more in SSAT compared to control group. In this study, It was also seen that motivationa sitıons of students were also important for the students achievement in solving mathematical problems.

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REFERENCES


Appendix A

A random student’s work

Answer Key
AN ANALYSIS OF THE SELF EFFICACY ABOUT COMPUTER PROGRAMMING OF THE ELECTRICAL-ELECTRONICS AND TEXTILE ENGINEERING STUDENTS IN TECHNOLOGY FACULTY

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Abstract
In this study, it is examined how the self-efficacy perception, which is as effective as cognitive level of academic achievement, changes according to department and sex in computer programming. Self-efficacy perception scale related to programming is used as data collection tool in the study. The research group consists of 119 students who take computer programming course in electrical-electronics and textile engineering departments of Marmara University Faculty of Technology during the spring semester of 2016-2017 academic year. The results of the study revealed that; the self-efficacy of students is high to perform simple programming tasks, but low in terms of performing complex programming tasks. In addition, it is observed that students in the electrical-electronics engineering department have a higher self-efficacy perception than students in the textile engineering department. Also self-efficacy beliefs differed with respect to their gender, male students have a higher self-efficacy perception than female students.

Keywords: Self-efficacy, Computer programming education, Engineering education.

INTRODUCTION

Self-efficacy is an important measure of understanding and predicting an individual's performance and mediates between the individual's knowledge and actions. This concept was first used by Bandura to explain the individual's ability to judge how well an individual will perform a task (Bandura, 1977, 1986).

Self-efficacy is a concept that includes beliefs about the motivation needed to meet situational demands, the cognitive resources of the individual and the capacity to start an action. Perceived self-efficacy has a structure that can be used to predict behavior (Bandura & Cervone, 1986).
Educational researchers are increasingly paying more attention to the role of students' thoughts and beliefs in the learning process. Self-efficacy; it is seen as an important factor because it affects the motivation and learning of the students (van Dinther, Dochy, & Segers, 2011).

As a result of rapid technological developments in information and communication technologies, demand for graduates with a high level of experience in computer skills is increasing in knowledge-based economies around the world. It is also seen that the level of investment in software-related industries has increased significantly compared to hardware-related industries (Shapiro, 2014). This is another factor that sets out the importance of courses related to programming instruction. On the other hand, the drop-out and failure rates in the introduction to computer programming in universities are a sign that learning these courses is a difficult task. There are studies showing that the drop-out rate and failure rate in computer programming entry courses is as high as 30 percent (Watson & Li, 2014).

In addition, the literature reveals several factors that may affect the success of the introductory courses in computer programming. These factors include previous computer experience (Byrne & Lyons, 2001; Ramalingam, LaBelle, & Wiedenbeck, 2004), self-efficacy in computer programming (Karsten & Roth, 1998), learning environment (Cigdem, 2015) mathematics or science background (Byrne & Lyons, 2001; Wilson & Shrock, 2001), and the mental model of the student in programming (Ramalingam et al., 2004; Soloway & Ehrlich, 1984).

Self-efficacy is an important concept related to the field of education, and potentially can also be used for different research in this area. The reason is that the self-efficacy theory also acknowledges that the actual performance of an individual affects their own self-efficacy and therefore may affect future performances. Therefore; it is likely that students with high self-efficacy in any area performing at challenging tasks and struggling with difficulties will be more successful than students with lower self-efficacy. In particular, achievements that progress by moving the student to higher levels than the lower levels positively affect self-efficacy. On the other hand, individuals with low self-efficacy tend to see their assigned tasks more difficult than they actually are. In this case, the individual may experience stress, depression, and a narrow viewpoint that cannot solve the problem. This reduces the chances of seeking new opportunities for learning. (Askar & Davenport, 2009). Researching student self-efficacy in the field of computer programming where failures are often experienced is increasingly important issue and presents new opportunities for solving educational problems and developing new pedagogical approaches in this area.

**Aim of the Study**
The aim of the study is to examine the programming self-efficacy perceptions of the undergraduate engineering students who have taken Computer Programming course in Technology Faculty. Within the scope of the study, students' self-efficacy perceptions of programming is examined in terms of 'performing simple programming tasks' and 'performing complex programming tasks', and answers to the following questions are sought.
1. What are the programming self-efficacy perceptions of engineer candidates who take computer programming courses?
2. Does the self-efficacy perceptions of engineer candidates taking computer programming course differ according to the following variable?
   a) According to sex
   b) According to the department

**METHOD**
This research is a descriptive study performed with the relational scanning model in the scanning models. In the relational screening model, it is aimed to describe the situation in the past or present as it exists. (Karasar, 2006).
Participants
Universe of the study is constituted of Marmara University Faculty of Technology students who take Computer Programming course in 2016-2017 academic year. The sample of the research included 119 undergraduate students studying Computer Programming course which is realized as two hours theoretical and two hours application in Electrical-Electronics and Textile Engineering departments of Marmara University Faculty of Technology in spring semester of 2016-2017 academic year. 80(67%) of the students who participated in the study are male and 39 (33%) are female. 68 (57%) of the students are in electrical and electronics engineering, and 51(43%) are studying in the textile engineering department.

Data Collection Tools
The data of the study are collected by using " Self-Efficacy Perceptions Scale Related to Programming" which was adapted to Turkish by Altun and Mazman (Altun & Mazman, 2012). This scale contains a total of 9 items. These three to nine belong to the "Simple Programming Tasks", which contain basic level tasks. The other 6 items regard to "Complex Programming Tasks", which involve more advanced programming tasks. In the scale prepared on the Seventh Likert type, substances scored as 1 = I do not trust myself at all, 2 = I usually do not trust myself, 3 = I trust myself a little, 4 = 50% / 50%, 5 = I am very confident in myself, 6 = I usually trust myself, 7 = I completely trust myself ' Those who responded to the scale get a maximum score of 63 on the scale, while they get the lowest score of 9. Gender, age and departmental information of the students were taken as demographic data and the scale was applied to the students at the last lesson of the semester.

RESULTS
In this section, the findings and interpretations based on the purpose and sub-objectives of the research have been given.

Self-Efficacy Perceptions of Students Related to Computer Programming
Table 1 shows the self-efficacy perceptions of the 119 students who participated in this research. The minimum, maximum, and average scores that can be taken from the scale were all calculated as 9, 63 and 31 respectively. According to Table 1, the average score of the students is 31. The calculated average score of the students for "performing simple programming tasks" was found as 13.7. Since this value is higher than the average score 12, which can be taken for this dimension, it can be interpreted that students have higher self-efficacy perceptions towards this dimension. In the aspect of "performing complex programming tasks", the average score of the students is 17.3. Since the mean score of this dimension is 24, it is obvious that the students have a low self-efficacy perception in terms of performing complex programming tasks.

Table 1: The statistical values of self-efficacy perceptions of students regarding computer programming.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Programming Tasks</td>
<td>119</td>
<td>3</td>
<td>21</td>
<td>13.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Complex Programming Tasks</td>
<td>119</td>
<td>6</td>
<td>42</td>
<td>17.3</td>
<td>10.8</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>9</td>
<td>63</td>
<td>31</td>
<td>15.9</td>
</tr>
</tbody>
</table>

Self-Efficacy Perceptions of Students Regarding Computer Programming in terms of Gender
In order to determine the self-efficacy perceptions of students regarding to computer programming in terms of gender, independent sample t-test was conducted. In Table 2, when the self-efficacy analysis result of computer programming according to the gender of the students is examined, it can be seen
that the difference between the self-efficacy scores of the male and female students was statistically significant. \((t(117)=-4.98, p<0.001)\). This difference was found to be a positive difference in favor of male students with an average arithmetic mean score of 4.77.

Table 2: T-Test results of self-efficacy perceptions of students in terms of gender regarding computer programming.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Arithmetic Mean</th>
<th>Standard Deviation</th>
<th>Degree Of Freedom</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>80</td>
<td>4.77</td>
<td>1.31</td>
<td>117</td>
<td>4.98</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Female</td>
<td>39</td>
<td>3.54</td>
<td>1.12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Self-Efficacy Perceptions of Students Regarding Computer Programming in terms of Departments

Independent sample t-tests were used to determine the self-efficacy perceptions of students regarding computer programming in terms of departments. According to the Table 3, the difference between the self-efficacy scores of Electric and Electronic Engineering and Textile Engineering students, was found as statistically significant \((t(117)=- 7.61, p<0.001)\). This difference was determined as a positive difference in favor of Electric and Electronic Engineering students with an average arithmetic mean score of 5.05.

Table 3: T-Test results of self-efficacy perceptions of students in terms of department regarding computer programming.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Arithmetic Mean</th>
<th>Standard Deviation</th>
<th>Degree Of Freedom</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric and Electronic Engineering</td>
<td>68</td>
<td>5.05</td>
<td>1.02</td>
<td>117</td>
<td>7.61</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Textile Engineering</td>
<td>51</td>
<td>3.45</td>
<td>1.27</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION AND CONCLUSIONS

This study examines the self-efficacy perceptions related to computer programming of the students in technology faculty. Results reveal the differences in the level of self-efficacy in terms of department and gender. Students participating in this study take programming courses for the first time in their higher education.

Students have a self-efficacy over the average in the dimension of simple programming tasks in the scale.

In the context of complex programming tasks, it appears that students have self-efficacy beliefs below the average. It is important that the students’ self-efficacy perception of any course is directly related to the performance they will exhibit. In addition, it is necessary to include activities and tasks in the curriculum that will increase this self-efficacy level.

In our study, male students have higher self-efficacy in computer programming than female students. This situation is parallel to other studies (Askar & Davenport, 2009; Gezgin & Adnan, 2016). But there are also studies indicating that self-efficacy does not change depending on the sex (Korkmaz & Altun, 2014)

As in many areas, self-efficacy perceptions in the field of computer programming are also important determinants of achievement. In computer programming which is an important area in engineering
career, students need to improve their analytical thinking skills and cognitive experience in order to be successful.

Taking these lessons before the higher education will increase these experiences and also increase the success of computer programming. In addition, by integrating the flipped classroom or blended learning environments into the computer programming lessons where students can follow the lesson in any time and place it is possible to increase their self-efficacy and as a result their success in programming (Cigdem, 2015).

Acknowledgment: The authors would like to thank Marmara University Faculty of Technology for supporting the study.

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REFERENCES


TURKISH EFL PRE-SERVICE TEACHERS’ CONCEPTIONS OF LITERACY: SOME IMPLICATIONS FOR TEACHER TRAINING

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Abstract
This study investigated English language teacher candidates’ perceptions of literacy and the place of literacy in their programme. Small-scale descriptive case study was conducted in mixed method design. Data were collected from 57 participants. The means and standard deviations of the quantitative data were calculated with SPSS programme. Qualitative data were theme-coded by using MAXQDA© 11, and the emerging themes were interpreted. The results indicated that the participants related literacy to language skills especially to reading. They think that literacy development is conducive to creative use of language in different ways. The most important notions associated with literacy are cultural knowledge and interpretation. Most participants also emphasized the link between L1 and L2 literacy skills. Ultimately, it is suggested that literacy training is advantageous and should be integrated into the relevant ELT courses. The findings yielded implications about how to develop prospective ELT teachers’ literacy skills through pre-service teacher training.

Keywords: Literacy, Teacher Training, English Language Teacher Education.

INTRODUCTION

Literacy is a term that has become the focus of educational, research and pedagogical discussions (Kern, 2000; Mora, 2011). Although its literal meaning is given as “the ability to read and write” in Cambridge Online Dictionary (Literacy, 2017), the literacy standards that individuals have been evaluated against have been changing constantly. Today, literacies are usually defined on a more contextual basis. That is why mathematical literacy, language literacy, and computer literacy are buzz words today (Kell & Pell, 2014). Historically, it has been closely associated with the growth and evolution of societies, and scholars have started to take keen interest in reflecting on the meanings of literacy since the middle of the 20th century (Kaestle, 1988). In recent times, diversity of discussions on literacy has become more relevant. To illustrate, the National Reading Conference has changed its name to Literacy Research Association, (Lankshear & Knobel, 2006), indicating that the term literacy is meant to go beyond its basic definitions.
LITERATURE REVIEW

Conceptual Framework for Literacy
The term of literacy has evolved along with the epistemological underpinnings and social alterations. While it had once been a high brow possession of high class elite, with the industrial revolution, masses were entitled with schooling and literacy as they were supposed to be versatile members of the workforce (Angello, 2001). The identification of literacy with the development rates and social change became the altruism in that era (Mora, 2011; Kaestle, 1988). In modern terms, literacy could be closely associated with corpus planning attempts and a strong belief in an optimum standard literacy taught in a top-down fashion in schools. That was also assumed to be a tool for nation building on a singular form of language (Fishman, 2012).

With the rise of post-modernism, singularity of literacy was questioned, and two models of literacy were put forward. The first concerns autonomous literacy model (ALM) which views literacy as a part of cognitive development, a set of skills, and an individual need to improve. The latter relates to ideological literacy model (ILM) which profoundly reflects the critical view that gives a meaning to literacy in its social background (Street, 1995).

This dual model for literacy was the start of a trend towards multiple literacies shaped by social constructivism, which advocates that knowledge is produced and passed down as a product of the collective interpretations of the members of a society (Trent et al., 1998). It was 2000 when Gallego and Hollingsworth developed multiliteracy framework that included three models: (1) School literacy; developing interpretive and communicative process that is necessary to adapt to school (2) Community literacy; the ability to comprehend and practice interpretive and communicative customs of cultural community (3) Personal literacy; having a critical personal interpretation of the school and community literacies. It might be said that in this frame, each type of literacy is the critique of the one or ones that precede it (Gallego & Hollingsworth, 2000). That frame also indicates how the singular hegemony of dominant literacy tradition is distributed in a more realistic way instead of a search for optimum literacy and denial of what is in practice. As well as Englishes spoken in certain foreign contexts, the development of online communication and internationalization of the societies have brought in multiliteral literacies. That is, the literacy practices in the settings where different cultures, social practices, and individual differences are melted and create their own implicit language policies and genres (Martin-Jones & Jones, 2000). Then it might be logical to say that this pluralist atmosphere obliges a critical viewpoint that prioritizes personal literacies where individuals scaffold their own meaning according to their current context.

Literacy In Language Teaching
When it comes to literacy in ELT, it is commonsense to see the shift in the idea of English from belonging to canon speech communities towards World Englishes shaped by multicultural native and nonnative speech communities (Kachru, 1990; Canagarajah, 2006). Each speech community contextualizes its own discourse and genre with its unique traditions (Johnstone & Kiesling, 2008). Thus, it may not be possible to teach an optimum form of literacy to learners of English as a Foreign Language (EFL) or English as a Second Language (ESL). That must bring in new perspectives to the content and methodology of language teaching. Critical literacy teaching is becoming the practice in many classrooms around the world. One study conducted at a university in Taiwan questions if the activities attain the goals of critical literacy and tries to draw implications on the use of critical literacy in Taiwan through using weblog reflections and observations (Kuo, 2009). Another study is about insights into the specific nature of the literacy practices around text interpretations at two Colombian secondary schools (Giraldo, 2006). How critical literacy and traditional literacy can be encouraged at the same time in an EFL reading and writing course was also handled in Taiwanese context (Huang, 2011). In Iranian context, another similar study was conducted to find out the effects of critical reading class on students’ willingness. Abednia and Izadinia (2013) report positive outcomes of critical literacy practices and advice teachers to offer chances for developing countries viewpoints different from their traditional perspective. Besides classroom researches on critical literacy, teachers’
views and awareness is very important as Luke and his fellows put it “teachers are the modern day arbiters of textual knowledge” (Luke et al., 1983, p. 118).

Research Problem
In ELT departments especially, the literacy skills is a new concept as the notion of literacy is usually associated with mother tongue. However, literacy as stated before is beyond knowing how to read and write. From that perspective, at a state university in Turkey, literacy skills and its relevance to ELT field was covered in different courses as a topic. The students’ perceptions on literacy and its place in ELT programme are significant as they will be teachers of English in the future. From that stance, the purpose of this study is twofold: (1) to find out the undergraduates’ perceptions about literacy and (2) to discover their perceptions of the place of literacy in English Language Teacher Education programmes.

Research Questions
RQ 1: What are the undergraduate English language teacher candidates’ perceptions of literacy at a Turkish state university?
RQ 2: What are the undergraduate English language teacher candidates’ perceptions of the place of literacy in their English Language Teacher Education programmes?

METHOD
The study was designed in a small-scale descriptive case study format. The study is mainly based on qualitative data analyzed with quantitative content analysis technique. The students were given a survey and were interviewed in a structured way. The quantitative data taken from the survey were analyzed and their means were calculated by using SPSS 24 software program. The qualitative data that come from the surveys were theme-coded by using MAXQDA© 11 software program and relevant results were reported and interpreted.

Sample / Participants
The setting was an English Language Teaching (ELT) Department at a state university in Marmara Region in Turkey. The participants were 57 undergraduate students whose ages range from 19 to 25 with a mean value of 21 (sd = 2.02). 18 of the participants were male while 39 of them were female. Their reading and writing habits were questioned and their responses were displayed in Table 1.

Table 1: Reading and writing habits of participants

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Reading</th>
<th>Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>Sometimes</td>
<td>27</td>
<td>18</td>
</tr>
<tr>
<td>Rarely</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>Never</td>
<td>-</td>
<td>6</td>
</tr>
</tbody>
</table>

As Table 1 reveals, 43.9% declare they read frequently while 47.4% report they sometimes read, 8.8% rarely read. When it comes to writing, it is seen that only 10% of the participants say they write frequently, and 31% of them sometimes write. It is noteworthy that 47% of the participants declare that they rarely write while 11% admit that they never write anything.

Instrument(s)
The data collection tool is a survey consisting of semi-structured questions created by the researchers using the literature review (Appendix 1). The survey is composed of two parts. First part involves demographic data regarding gender and age. Second part of survey comprises 10 questions about literacy and participants’ perception of literacy. Four questions are in multiple-choice format, one question in ordering format and five questions in open-ended question format. In questionnaire, seven
principals of literacy developed by Kern (2000) took part in question 3 in order to learn about participants’ order of importance.

FINDINGS

In order to answer RQ 1, the survey was conducted with 57 students in total. Some students answered all questions while some of them chose to omit some questions. The data were coded and analyzed in order to detect common patterns from students’ perceptions of literacy. As a result, five themes were identified involving (1) definition and content of literacy, (2) the effect of literacy on creative use of language, (3) the link between critical thinking and literacy, and (4) the connection between First Language (L1) and Second Language (L2) literacy skills, and (5) the place of literacy in ELT curriculum.

The Students’ Perceptions about the Definition and Content of Literacy

When the content analysis of the definitions was conducted, it is apparent that most students associated literacy with language skills with different combinations. Six of the participants linked literacy concept to the integration of four skills while three of them associated literacy with only productive skills; reading and writing, and one of them related it only to receptive skills of reading and listening and their integration. In addition, six of the participants referred to only writing skill in their accounts of literacy, five of them mentioned only reading skill by reference to the definition of literacy. However, it is noteworthy that an overwhelming majority of the students (N = 22) associated literacy concept with both reading and writing.

Another outstanding component of the literacy definitions highlighted by the participants was interpretation. 17 of the participants expressed their beliefs about interpretation in an effort to define literacy. Also, most of them indicated that literacy was the ability to interpret “what someone reads” or “the written language”.

The next significant theme resulting from the set of definitions generated by the participants was critical thinking. While five of the participants included the notion of “critical thinking” directly into their definitions, six of them defined critical thinking as “originality”, “authenticity” and “creativity”. In addition, four of them defined literacy as “problem solving”.

Another theme emerging from the definitions of the students was self-awareness and development. Five of the participants thought that literacy was about self-awareness and self-development. Also, three of them thought that reflection and universality are part of literacy. All in all, the term of literacy was mostly associated with language skills, but many students thought that it was a more inclusive notion that involves concepts like universality, self-development, and critical thinking.

Furthermore, students were also asked to place certain concepts into the order of importance regarding their association with literacy concept. The results are revealed in Table 2.

Table 2: The Concepts That the Students Associate with Literacy

<table>
<thead>
<tr>
<th>Component</th>
<th>N</th>
<th>m</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural knowledge</td>
<td>57</td>
<td>3.29</td>
<td>2.08</td>
</tr>
<tr>
<td>Interpretation</td>
<td>57</td>
<td>3.29</td>
<td>1.78</td>
</tr>
<tr>
<td>Language use</td>
<td>57</td>
<td>3.33</td>
<td>2.37</td>
</tr>
<tr>
<td>Reflection and self-reflection</td>
<td>57</td>
<td>3.74</td>
<td>1.94</td>
</tr>
<tr>
<td>Problem solving</td>
<td>57</td>
<td>4.26</td>
<td>1.76</td>
</tr>
<tr>
<td>Collaboration</td>
<td>57</td>
<td>4.81</td>
<td>1.42</td>
</tr>
<tr>
<td>Conventions</td>
<td>57</td>
<td>5.25</td>
<td>1.57</td>
</tr>
</tbody>
</table>
As Table 2 demonstrates, the most important notion associated with literacy is cultural knowledge and interpretation while collaboration and conventions are the least important ones. The results reveal a partial consistency with the definitions of literacy given by the students.

**Students’ Perception about the Effect of Literacy on Creative Use of Language**

When it comes to the effect of literacy on creative use of language, it is apparent that an overwhelming majority of the participants considered that literacy had a positive influence on creative use of language skills. According to only four participants, its effect was neutral and for only one of them literacy had negative effect on creative use of language skills. However, those participants surprisingly did not provide support for their ideas. On the other hand; most participants believed that literacy development helped creative use of language in different ways. 18 of the participants thought that literacy prompts creative language use by improving language skills because it develops “fluency” and “integration of skills”. Also, two of the participants thought that literacy improves creative language use by improving pragmatic competence, in other words “use language appropriately”. Apart from linguistic points, 8 of the participants declared that literacy helps by improving critical thinking process, and 7 participants reported that literacy directly developed “creativity” or “imagination”. Moreover, 4 participants thought that literate people had access to more knowledge, so they use language more creatively, and two of them pointed out that literacy led them to a broader perspective to use the language in creative ways. Three of them also noted that literacy helps them use language more creatively by developing their self-expression abilities. Finally, one of them felt that development of literacy would benefit people in a variety of ways and also “improve their self-esteem” regarding “the use of language in innovative ways”.

**Students’ Perceptions about the Link between Critical Thinking and Literacy**

Indeed, when asked to clarify the link between critical thinking and literacy, the participants agreed with the view that critical thinking skill is a part of literacy skills. While only 18 participants reported that critical thinking was not a part of literacy, 36 of them confirmed that critical thinking skill was broadly a counterpart of literacy skills. One of them even maintained that “It requires critical thinking. Critical thinking makes literacy meaningful”. Six participants noted that critical thinking took different forms as part of the critical thinking. Four participants pointed out that critical thinking served as a pathway for discussing the issues such as cultural awareness and cultural transfer. Also, four participants stressed that literacy required critical thinking to analyze and interpret texts while two of them found critical thinking necessary for literacy to “discover hidden meanings in the texts”. Finally, two participants viewed self-expression and self-criticism as parts of literacy, which also required critical thinking skills.

**Students’ Perception about the Connection between L1 and L2 Literacy Skills**

When asked, 52 participants declared their ideas on the connection between L1 and L2 literacy skills. The results also showed that 43 of the participants pointed out that there was a link between L1 and L2 literacy skills whereas only 9 of them thought that there was by no means link between the literacy skills of L1 and L2.

7 of the participants declared that having literacy skills in L1 helped people understand the literacy of L2. For instance, one participant said that “when you read or write in the second language, you think about your mother tongue”. Another went on to say, “If you can interpret something in the literacy of your own language, so you can gain the ability to connect them and understand better”. Another theme was that 15 participants thought that L1 literacy skills helped to learn about L2 literacy. One of the participants added that L1 literacy assisted L2 literacy “we pass our skills to L2 literacy.” Another claimed “One who has the wisdom of literacy skills in L1 will use it while learning in L2”. Another summarized the link between L1 and L2 by saying that “we use our L1 framework while learning L2 skills”. Another theme deriving from the data indicated that L1 and L2 literacy skills had an influence on each other mutually. They thought that “they must be integrated in the process”.

9 participants disagreed the view that that there was a connection between L1 and L2 literacy skills as stated before. Some gave a rationale for their ideas. One participant said, “It is difficult to use L2
literacy in this setting, but it is easy to implement L1 literacy skills in our setting”. Two other added, “They are different languages” and “The culture is different in both, so there is no link between them”. All in all, the link between L1 and L2 is recognized by most participants while few of them feel that there is no link between them.

Perceptions of the place of literacy
RQ 2 seeks information about the perceptions of the participants of literacy in relation with their English Language Teacher Education programmes. In order to collect information about perception of participants, two questions were addressed first of which asking about their ideas on literacy training as a part of tertiary level ELT education with advantages and disadvantages. The second question was dealing with their opinion about the place of literacy skills in their current ELT programme and two options of literacy; as a separate course or as an integrated topic.

Literacy training as a part of tertiary level ELT education
The participants stated both positive and negative ideas about literacy training as a part of tertiary level ELT education. When the answers of participants were examined with using MAXQDA© 11 qualitative analysis program, it was found that 36 utterances for advantage and 16 utterances for disadvantage were mentioned. 36 positive utterances were collected under 12 different codes. The code with the highest frequency (8 times) is “Professional Education.” 8 participants think that literacy training brings development in professional education of undergraduate English language teacher candidates. Then, the two codes with the same second highest frequency (6) are “Understanding Better” and “Writing and Speaking.” Six participants think that having literacy training will help to “Understand Better” the topic under investigation and there are six statements implying that literacy training will develop writing and speaking skills. 5 participants stated that literacy training would contribute to the development of self as represented by “Improve Self”. Three frequencies were found for two different codes of “Language Skills” and “Culture” that is to say three participants thought that literacy training would develop all language skills. Three participants stated that literacy training developed their cultural competency. Moreover, two participants uttered that literacy training contributed to their “Creativity.” Furthermore, the codes of “Given Earlier”, “Authenticity”, “Enjoyable”, “Learning Style” and “Beneficial” were mentioned only for one time so they each had one frequency.

For the disadvantage of literacy training, 16 utterances were associated with 10 codes with either two or one frequencies. Codes of “Not Satisfied”, “Boring” and “Difficult” were included in statements by two different participants. They were not satisfied by the current literacy training and they regarded it as difficult. Codes of “Time-consuming”, “Inadequate Information”, “Need Time”, “Politics”, “No Need”, “Feel Anxious” and “Using Wrong Phrase” were mention only for one time so their frequency was one. One participant thought that it was time-consuming and one thought that he/she did not have enough information about literacy training. One participant stated that he/she needed time to integrate it into training process. One uttered that it was about politics while the other found literacy to be unnecessary.

The place of literacy skills in ELT programme
Another question at the survey for RQ 2 was about the place of literacy in ELT programme. Should it be presented in an integrated manner as a part of an existing course? if so, which course- or as a separate course of syllabus? When the analysis results of participants’ answers are taken into consideration, 63 utterances were found and they were collected under 9 codes. 23 participants thought literacy skills as a separate course and 40 participants as integrated in a course.

Code of “Separate Course” had a frequency of 23. That is, 23 participants thought that literacy skills should be presented as a separate course in their ELT programme. Code of “Literature” had second highest frequency (19) and most of the participants favoured its integration into literature course. Then 11 participants tended to incorporate it into reading and writing courses.
DISCUSSION AND CONCLUSION

This research aimed to examine the Turkish EFL pre-service teachers’ views on literacy and to yield some implications for teacher training. In this manner, undergraduate English language teacher candidates’ perceptions of literacy and their perceptions of the place of literacy in their English language teacher education programme were questioned employing a survey.

In order to examine participants’ perceptions of literacy, four themes were used; definition and content of literacy, the effect of literacy on creative use of language, the link between critical thinking and literacy, and the connection between First Language (L1) and Second Language (L2) literacy skills. For theme of definition; majority of participants relate literacy to language skills especially to both reading and writing. Also, most of the participants linked literacy with the concept of “Conventions.” For the theme of the effect of literacy on creative use of language, a huge number of participants stated that literacy had a positive effect on creative use of language skills. For the theme of the link between critical thinking and literacy, most of the students uttered that there was a link between critical thinking skill and literacy skills. For the theme of the connection between L1 and L2 literacy skills, a large number of participants stated that there existed a link between L1 and L2 literacy skills.

In order to examine participants’ perceptions of the place of literacy in their English language teacher education programmes, two main themes were used; ideas on literacy training and opinion about the place of literacy skills. For the theme of ideas on literacy training, the majority of participants thought that literacy training was advantageous by talking about codes of professional education, understanding better, writing and speaking and more. For the theme of opinion about the place of literacy skills, although some participants considered literacy as a separate course, most of the participants thought it as integrated in a course like literature, reading and writing, academic reading or academic writing.

When the definitions students gave for literacy are considered, it might easily be concluded that most of them primarily associated literacy notion with reading and writing. That is not surprising because its common connotation come from its literal meaning. However, it may also be assumed that the students are growing an awareness of “multi-literacies” (Martin-Jones & Jones, 2000) because they also include interpretation critical thinking, self-awareness, and reflection into their own understanding of literacy concept (Martin-Jones & Jones, 2000). The variety of the definitions they gave can be said to reflect the multi-literacies trend that proposes a more flexible perspective regarding to literacy (Martin-Jones & Jones, 2000) instead of a dual model (Street, 1995). Thus, it may be assumed that the participants perspectives have been evolving to the personal literacy model, which constitutes the last stage of Gallego and Hollingsworth’s multiple literacies framework (Gallego & Hollingsworth, 1992) at higher education rather than adopting what is imposed to them at lower stages of education. However, some students also included cultural awareness and cultural transfer into their definition of literacy and emphasized the link between L1 and L2 literacies. This implies that the teacher candidates are also aware of the community literacy model perspectives.

When it comes to the students who include only language skills of reading and / or witting, they may be said to be describing literacy from a school literacies model perspective (Gallego & Hollingsworth, 2000). That interpretation seems to put the teacher candidates’ perceptions of literacy into a framework of multiple literacies and indicate that students have perspectives of different models of multiple literacies framework regarding their perceptions of literacy. The understanding of multiliteracies framework may allow especially teacher candidates to understand their students’ perspectives and gain them those practices (Cervetti & Pearson, 2006). This is particularly valuable in a country where millions of refugees get education in blended schools with locals.

Another point is students’ ideas on the place of literacy in ELT programme curriculums. 63 participants pointed out that literacy should be part of their education in the ELT programme. Some of them
pointed to the need for a separate literacy course while the rest of them insisted that literacy should be integrated into other courses. As Kellner (1998) proposes for multicultural societies, multiliteracies seem like a solution because it may help to empower students who will need to deal with literacy perspectives of many cultural or technological contexts. The importance that the EFL teacher candidates ascribe to literacy training is of particular significance in this respect.

All in all, Turkish EFL pre-service teachers relate literacy to language skills especially to reading and they further think that writing and literacy prompt a creative use of language and critical thinking. There is evidence to suggest that there is a link between L1 literacy and L2 literacy skills. Therefore, literacy training can be advantageous when it is incorporated into the contents of the relevant courses existing in the syllabus.

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**REFERENCES**


**Appendix 1**

**SURVEY ON LITERACY IN ELT**

Following questions are intended to explore your perceptions on literacy in English Language Teaching (ELT). There is no right or wrong answer and your reflections are important, so please feel free to answer the questions in a truthful manner.

Please note that:

*Literacy is accepted as:*

the ability to read and use written information and to write in a range of contexts. Literacy involves the integration of speaking, listening and critical thinking with reading and writing. Effective literacy is intrinsically purposeful, flexible and dynamic and continues to develop throughout an individual's lifetime (Australia’s Language and Literacy Policy Companion Volume to the Policy Paper, 1991). Thank you for your participation.

**I. Personal Information**

1. Gender:
   a. Male
   b. Female

2. Your age: ___________
II. Items: Please answer the following questions appropriately.

1. Were you informed about literacy in any educational or academic setting before?
   a. Yes           b. No

2. How did you engage in “literacy” for the first time?
   a. Through online sources  b. Through seminars/conferences
   c. As a school subject      d. Literature course
   e. Through academic course of reading and writing  f. Through reading for pleasure
   g. Others. If any, please specify............

3. Please, specify the following items in order of importance regarding your own understanding of literacy (1: The most important; 7: The least important)
   a. ...... interpretation
   b. ...... collaboration
   c. ...... conventions
   d. ...... cultural knowledge
   e. ...... problem solving
   f. ...... reflection and self-reflection
   g. ...... language use

4. What is your own definition of literacy?

5. How often do you read / write in your free time? Please, choose only ONE item.
   
   **READING**  
   a. frequently  
   b. sometimes  
   c. rarely  
   d. never  

   **WRITING**  
   a. frequently  
   b. sometimes  
   c. rarely  
   d. never  

6. How does literacy teaching affect creative use of language skills?

7. What do you think about literacy training as a part of tertiary level ELT education? What would be the advantages and disadvantages?

8. What course(s) should include literacy skills in your current ELT programme or should literacy be a separate course? Why do you think so?

9. Is there any connection between L1 and L2 literacy skills?
   a. Yes, because .................................................................
b. No, because .................................................................

10. Do you think that critical thinking is a part of literacy skills?

a. Yes  

b. No

If yes, please specify your reasons.
                                                                                                                                                                                                                                                                                                                                                     
REVERSE LOGISTICS, ITS RELATION WITH COST AND SUSTAINABILITY, ITS INCLUSION IN CURRICULUM

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Abstract
The effects of globalization developed the technology, competition, product range and supplied the needs of the people while also causing depletion of resources and danger for the environment. Precautions were taken to protect the environment and raise awareness of the consumers to use products of environment conscious companies. These developments have directed the companies to ‘reverse logistics’; a process of flowing of previously sold products from consumption point to the point of recovery for the purpose of recondition, reproduce or dispose.

Reverse logistics is in relation with sustainability especially because of recycling the products. Controlling and managing the cost of reverse logistics is a key point to overcome the cost problems.

The aim of this study is to examine ‘reverse logistics’ concept, its relation with cost and sustainability and its inclusion in undergraduate logistics curriculum, if it’s included as a unique course, or a part of another course, or not included.

Keywords: Reverse logistics, Reverse logistics cost, sustainability, logistics education.

INTRODUCTION
The effects of globalization developed the technology, competition, product range and supplied the needs of the people while also causing depletion of resources and danger for the environment. Precautions were taken to protect the environment and raise awareness of the consumers to use products of environment conscious companies; the companies who are addressing waste and sustainability have become more preferable by the consumers and these developments have directed the companies to reverse logistics by which they will have environment friendly image and thereby having good relations with consumers which will lead to protect and continue their market share (Vahabzadeh and Yusuff, 2012: 36; Deran, 2013: 54).

The concept of logistics was first introduced to the business literature in 1984 by the definition suggested by the National Council of Physical Distribution in the United States which was later named the Council of Logistics Management (Akyıldız, 2004). The Council of Logistics Management (CLM), which is established by the purposes of bringing rules to the logistics sector and making definitions by service providers, service takers, academicians, consultants, software industry and equipment manufacturers, defines the logistics management as follows (Sezgin, 2015): “It is to plan, implement, and control the movement and storage of materials, services and information flows in the supply chain..."
from the start point of the raw material to the end point where the product is consumed, both effectively and efficiently, to meet the needs of the consumers.”

According Coyle et al., it is understood by this definition that the logistics process can be seen as a system or structure that allows decisions to be made to carry out the entirety of transport, stock, storage, packaging and other related activities, including cost and service linkage in the supplier’s customer flow (İboş, 2015: 17-18).

After the above explanation of the importance of reverse logistics and general information about logistics and logistics system, the aim of this study is to examine ‘reverse logistics’ concept, its relation with cost, and with sustainability and its inclusion in undergraduate logistics curriculum.

**Definition and Scope of Reverse Logistics**

The first definition of reverse logistics was made by Lambert and Stock (1981) in the beginning of the 80's stating that it is “going the wrong way down on a one-way street, because the majority of product shipments flow in one direction”, because the product shipment was done in a one-way flow. Throughout the 80s, reverse logistics was limited to the definition of the movement of products from manufactures to the consumer, in the opposite direction to the directional flow (Karabulut, 2009: 9).

According to another definition, reverse logistics can be described as “planning, implementation and control activities to enable the flow of product and information from the point of consumption to the point of origin so that the value can be recovered or destroyed in an appropriate manner” (Nakıboğlu, 2007: 183). In addition, James Stock, one of the researchers who contributed greatly to the Reverse Logistics Theory, defines it as “the role of logistics in product returns, resource reduction, recovery, material substitution, material reuse, waste disposal and incineration, repair and production” (Erturgut, 2016: 232).

Apart from these definitions, many researchers have defined reverse logistics in various forms. While Pohlen and Farris (1992) define it as “the movement of the products in the distribution channel from the consumer to the manufacturer”, Kroon and Vrijens (1995) point it as “logistics management skills and activities that should be used for the removal, management and disposal of hazardous or non-hazardous wastes from packaging and products by reversing normal distribution activities”. Fleischmann, M. et al. (1997) define reverse logistics as “the activities in logistics flow which will be carried out on behalf of the consumers so that the products which are no longer useful can find their place in the market again”. Additionally, while Rogers and Tibben-Lembke (1999) define it as “planning, controlling, implementing, and checking the efficiency of the process by taking the goods from the point of consumption to the origin in order to ensure the return or proper destruction of consumed goods and related information”, Dowlatshahi (2000) describe it as “the redesign and management of the flow of products to be reproduced, recycled, destroyed or reused effectively integrated with the supply chain of reverse logistics systems”.

**Reverse Logistics and Green Logistics**

Reverse logistics as a new research area has been used with different concepts that have mostly similar meanings such as reversed logistics, return logistics, retro logistics and reverse distribution in the literature. However, reverse logistics and waste management are different concepts. While waste management is concerned with how to dispose of worthless waste, reverse logistics deals with the wastes that can create value when they re-enter the logistics supply chain. On the other hand, there are similarities and differences between reverse logistics and green logistics. While green logistics aims to achieve a sustainable perspective on all logistics activities that are from the manufacturer to the consumer, reverse logistics is concerned with all the logistic activities from the consumer towards the manufacturer which is realized in the opposite way of the green logistics flow. (Quoted from Brito and Dekker, 2002 by Bulut and Deran, 2008: 329-328). Green reverse logistics is defined Vahabzadeh and Yusuff, (2012: 37) as “the process of managing returns, including different types of materials, and transportation from the point of consumption to the point of origin to minimize the destructive
effects on environment”. Rogers and Tibben-Lembke (2001) classify similarities and differences between reverse logistics and green logistics as seen in Figure 1:

Figure 1: Comparison of Reverse Logistics and Green Logistics
(Source: Rogers and Tibben-Lembke 2001: 131)

The Relation of Reverse Logistics with Sustainability
Enterprises use natural sources when they produce goods and services for the needs of people (Çamlıca and Akar, 2014: 101). The natural sources are limited and the destruction that industrialization caused on natural sources and environment threatens the future generations and this has caused an awareness which has formed the concept of ‘sustainability’. As the environmental and social problems like unemployment and poverty which were raised together with population growth became irrecusable, ‘sustainable development’ concept came up (Yalçınkaya, Durmaz and Adiller, 2011: 3321). World Commission on Environment and Development (WCED) Report (1987: 54), which is also known as Brundtland Report, defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It also mentioned that it is a combination of environmental, economic and social factors which was also defined with regard to triple bottom line as economic prosperity, environmental quality and social justice (Quoted from Elkington, 1997 by Lee and Lam, 2012: 590; WCED Report, 1987).

‘Sustainable development’ concept is closely related to recovery of products which is one of the parameters of Reverse Logistics (Bulut and Deran, 2008: 342). With regard to sustainability, reverse logistics is defined as “a business strategy that acts as the driving force of putting recovery activities in action effectively in order to increase sustainability” (Ayvaz, Bolat and Aydin, 2015: 391). Remanufacturing, repairing and recycling are from the recovery alternatives of reverse logistics.

Reverse logistics can be considered together with the dimensions (economic, environmental, social) of sustainability. Tangible and intangible economic and business factors, the standard cost/benefit analyses of payback, return on investment and also organization’s customer service dimension should be considered in evaluating reverse logistics decisions (Presley, Meade and Sarkis, 2007: 4606-4608). The increase of the awareness of consumers to environmentally friendly products necessitates the implementation of effective reverse logistics which supports recycling, remanufacturing and reclamation practices from environmental perspective. The influence of reverse logistics on social dimensions may be sometimes company or industry specific, such as predisposition towards more or less socially useful practices of reverse logistics, For instance, safety issues for employees may be influenced by product type. There are many social issues of reverse logistics that need to be included in sustainability evaluation process.

Lee and Lam (2012: 590) examined the studies related to the practices leading to sustainable outcomes and stated that some studies focused on “remanufacturing as an effective way to maintain products in a closed-loop, in reducing both environmental impacts and costs of the manufacturing processes and sustainability strategies in remanufacturing require proper planning, efficiency and effectiveness in the process”; they also stated that another strategy for sustainable development is recycling where the main point is on product recovery management.
With sustainable green policies, it is created more efficient working opportunities that use resources properly by in-company training and sustainability also facilitates adapting to technology (Musiad Research Report, 2015: 127). Besides, it causes the company to be differentiated as having high social responsibility in the eye of conscious society.

Reverse Logistics Activities
Rogers and Tibben-Lembke (2001) list the reverse logistics activities as "reproduction, repair, recycling, waste burial, repackaging, return and recovery". Brito and Dekker (2002), on the other hand, classify them in 4 groups of collection, control/selection/classification, direct recycling (reuse, resale and redistribution), and reprocessing (repair, maintenance, reproduction, recovery and recycling).

A. Repair: In this step, it is ensured that the returned product becomes operational again by means of repairing and replacement of defective parts. A relative reduction can be seen in the quality of the repaired product relative to its original.

B. Refurbishment: In order to achieve a standard quality level of the consumed product, the product is refurbished by upgrading or renewing the critical parts after the product is separated. This is a step that increases the quality of the product. The process of refurbishing aircraft used for military or commercial purposes is an example of this step.

C. Remanufacturing: The returned product is made to conform to the quality standards of newly produced products. In this step, change, repair, control and assemble are made and various improvements can be made in the product.

D. Product Cannibalization: This step means that when a company offers two products with the same quality, one is cheaper while the other is expensive, there happens an affect in the market regarding the better sales of cheaper product than the expensive one as market share. In this step, unlike other steps, only a small part of the product is reused. These parts are used in repair, refurbishment and reproduction.

E. Recycle: In the above-mentioned steps, the main purpose is to protect the functions and qualities of the product. However in this recycle step, these functions become dysfunctional, and the main goal here is to recycle these materials. For instance, in many developed countries such as the
USA, Germany and England, metal parts, which account for 75% of the weight of used cars, are recycled.

The Relationship Between Reverse Logistics and Costs

The activities including transportation, warehousing, inventory management, handling, order processing, packaging, procurement and information management in the logistics flow process are expressed as logistic costs. In this regard, logistics costs can also be expressed as costs caused by procurement, production, sales, and distribution. According to a broader definition provided by Keskin (2006), logistics costs are composed of cost elements starting with material procurement process and continuing with sales, distribution and after-sales services including transportation, insurance, customs clearance, interim transport, storage, deterioration, damage, loss, late delivery, penalties, mistakes costs, information systems, information communication, personnel, non-optimal order quantity costs, stockpile and idle capacity costs in transportation vehicles. The management and control of logistics costs firstly require the determination of these costs (Tokay, Deran, and Arslan, 2011).

As the returned, recalled, or unprofitable products in the reverse logistics activities are cost elements, they have a key importance in terms of the perceptions of the manufacturers, and therefore managing this process is of vital significance. How to obtain products to be recycled from customers, management of semi products, raw materials or useless wastes emerging as a result of classification, disassembling and disposal of recalled products in a controlled manner or repairing are among the important elements of how to effectively deal with reverse logistics costs (Dirik, 2012: ii).

In addition to specifying the recall of products by the concept of reverse distribution, Chandran and Lancioni (1981) show schematically the distribution channel of the recalls and how recalls can increase which cost items in the companies. They also categorized these cost items into four sections including communication costs (mail, telephone etc.), renewal costs (production, labeling, packaging, storage, etc.), documentation costs (renewing invoices of recalled products, repairs, etc.), and refurbishment costs (parts placement, stocking, repair, renewal, etc.).

Because finding the share of reverse logistics on the total costs can only be possible by determining the certain shares belonging to the reverse logistics within each logistics process, it is a challenging process to deal with. On the other hand, the concern of a majority of studies in reverse logistics is being unable to have logistics performance to minimize costs by while having profit maximization by integrating reverse logistics to all other logistics processes. Stock (2001) estimates that the share of reverse logistics on total logistics cost is about 4% (Lambert et al., 2011: 562; Yu, 2016: 2694). According to Hill (2004), it is estimated that 20% of all products sold are returned and 5% of companies' logistics costs are spent for reverse logistics (Nakboğlu, 2007: 186).

Recovery and recycle of products, which are the parameters of reverse logistics, have an important place on operating costs. Such returns reduce direct business profitability. The presence of obsolete products in each logistics flow further increases the cost burden of the companies. On the other hand, it is necessary for the analysis of the products to be renewed to be done correctly and for the cost advantage of the analysis to be carried out by the experts. Any mistakes that can be made in this process can bring additional costs to the companies. Moreover, the return of unacceptable products causes additional costs and damages to the image of the manufacturer. All these are the direct or indirect costs that the manufacturers have to deal with to have a long place in the market (Çetik and Batuk, 2013: 371).

It is difficult for companies to predict how many products they will take back under the circumstances of reverse logistics activities. Thanks to a well-managed reverse flow process, recycling of recalled products in the manufacturing process both helps saving of raw material and poses an environmentalist approach. In addition to this, recycling of the product in the re-production flow can provide added value and they can be offered to second hand markets. All of this shows that reverse...
logistics is advantageous in terms of cost. For this reason, the importance of reverse logistics activities is increasing (Quoted from Coşkun, 2011: 42 by Dirik, 2012: 76).

Reverse logistics can provide both direct and indirect benefits to companies in economic terms. The materials and the processes that create added value are transformed directly into economic gains by providing cost advantages. Besides, the positive environmentalist image created by the reverse processes attracts more customers to the business and the market share is preserved (Quoted from Fleischmann, 2001 by İlgün, 2010: 24).

Creating an effective reverse logistics network that is cost-effective and sustainable can be more difficult than designing advanced logistics networks. Returned product quantities, return timings, how favorable the recovery of the returned product is have an impact on cost analysis in reverse processes. In addition, a good information flow system needs to be set up in order to calculate the costs of the reverse processes (İlgün, 2010: 26-27).

During the recovery of the products, many technical processes are applied. Especially since the reprocessing requires a significant amount of investment, reverse processes should be regulated accordingly, taking into account the costs of recalling the products and performing the reflows.

If reverse operations are implemented effectively and efficiently, they can provide an advantage over the competition with other companies in the same market by providing a cost-reducing effect on logistics processes such as transportation and storage related to return activities as well as reducing the cost of obtaining raw materials and materials (İlgün, 2010: 60).

**METHOD**

The aim of the research part is to examine the inclusion of the ‘Reverse Logistics’ concept in undergraduate logistics curriculum in Turkey. Undergraduate programs are chosen from the “Student Selection and Placement System Guide for Undergraduate Programs 2017” which has "logistics“ name. Undergraduate programs in Cyprus aren’t included in the study.

The number of logistics programs are listed according to the name and the number of the schools of faculties that contain these programs are listed under the name of each program.

Curriculums are examined if they contain a unique course of ‘reverse logistics'; or this concept is contained as a part in another course, or not included in any of the courses. Curriculums which contain ‘Reverse Logistics’ as a separate course are analyzed according to the credit-hour basis; it is also mentioned whether the course is compulsory or elective. The results are shown in tables.

**FINDINGS**

There are 64 Logistics undergraduate programs in 60 Universities in Turkey. 4 universities have 2 different logistics program. Curriculum of one of the programs couldn’t be reached, so, curriculums of the 63 programs are analysed. In 6 programs, curriculums could be reached but course contents couldn’t be reached. In 2 programs course contents were not adequate. 3rd and 4th year’s curriculum couldn’t be reached in 1 program and 4th year’s curriculum couldn’t be reached in 2 program.

The number of each logistics program and the school and faculties that they are contained are shown in Table 1 and Table 2. The programs are.
Table 1: Number of each Undergraduate Logistics Programs

<table>
<thead>
<tr>
<th>Logistics Programs</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Trade and Logistics</td>
<td>31</td>
</tr>
<tr>
<td>International Logistics and Transportation</td>
<td>9</td>
</tr>
<tr>
<td>Logistics Management</td>
<td>6</td>
</tr>
<tr>
<td>International Trade and Logistics Management</td>
<td>5</td>
</tr>
<tr>
<td>International Logistics Management</td>
<td>4</td>
</tr>
<tr>
<td>Logistics</td>
<td>3</td>
</tr>
<tr>
<td>International Logistics</td>
<td>3</td>
</tr>
<tr>
<td>Transportation and Logistics</td>
<td>1</td>
</tr>
<tr>
<td>Logistics and Transportation</td>
<td>1</td>
</tr>
<tr>
<td>Transportation and Logistics Management</td>
<td>1</td>
</tr>
</tbody>
</table>

As it is seen in Table 1, International Trade and Logistics, International Logistics and Transportation and Logistics Management programs constitute more than two thirds of the whole undergraduate logistics programs.

Table 2: Classification of the Schools /Faculties under each Logistics Program They Contain

<table>
<thead>
<tr>
<th>Logistics Programs</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International Trade and Logistics</strong></td>
<td>31</td>
</tr>
<tr>
<td>Faculty of Economics and Administrative Sciences</td>
<td>11</td>
</tr>
<tr>
<td>School of Applied Sciences</td>
<td>7</td>
</tr>
<tr>
<td>Faculty of Applied Sciences</td>
<td>4</td>
</tr>
<tr>
<td>School of Applied Technology and Management</td>
<td>2</td>
</tr>
<tr>
<td>Faculty of Economics, Administrative and Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Faculty of Management</td>
<td>2</td>
</tr>
<tr>
<td>Faculty of Humanities and Social Sciences</td>
<td>2</td>
</tr>
<tr>
<td><strong>International Logistics and Transportation</strong></td>
<td>9</td>
</tr>
<tr>
<td>School of Applied Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Faculty of Economics and Administrative Sciences</td>
<td>2</td>
</tr>
<tr>
<td>Faculty of Economics, Administrative and Social Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Faculty of Business Administration and Management Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Faculty of Business Administration</td>
<td>1</td>
</tr>
<tr>
<td>Faculty of Commerce</td>
<td>1</td>
</tr>
<tr>
<td><strong>Logistics Management</strong></td>
<td>6</td>
</tr>
<tr>
<td>Faculty of Business and Administrative Sciences</td>
<td>2</td>
</tr>
<tr>
<td>Faculty of Business</td>
<td>2</td>
</tr>
<tr>
<td>Faculty of Economics, Administrative and Social Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Maritime Faculty</td>
<td>1</td>
</tr>
<tr>
<td><strong>International Trade and Logistics Management</strong></td>
<td>5</td>
</tr>
<tr>
<td>Faculty of Economics and Administrative Sciences</td>
<td>2</td>
</tr>
<tr>
<td>Faculty of Business Administration</td>
<td>1</td>
</tr>
<tr>
<td>Faculty of Business and Management Sciences</td>
<td>1</td>
</tr>
<tr>
<td>School of Applied Technology and Management</td>
<td>1</td>
</tr>
<tr>
<td><strong>International Logistics Management</strong></td>
<td>4</td>
</tr>
<tr>
<td>Faculty of Business Administration</td>
<td>2</td>
</tr>
<tr>
<td>Faculty of Business Administration and Management Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Faculty of Economics and Administrative Sciences</td>
<td>1</td>
</tr>
<tr>
<td><strong>Logistics</strong></td>
<td>3</td>
</tr>
</tbody>
</table>
School of Applied Sciences

International Logistics
  Faculty of Business Administration
  Faculty of Business and Administrative Sciences
  School of Applied Sciences

Transportation and Logistics
  Faculty of Transportation and Logistics

Logistics and Transportation
  School of Applied Sciences

Transportation and Logistics Management
  Faculty of Applied Sciences

Table 2 shows the logistics programs and the classification of Schools and Faculties that they are contained. Faculty of Economics and Administrative Sciences, School of Applied Sciences and Faculty of Business Administration mostly contain different logistics programs.

The main analysis of this paper to find out the inclusion of ‘Reverse logistics’ concept in the 63 curriculums as a separate course or as a part in another course. If it is included as a separate course, it is also analyzed on credit hour basis and whether it is compulsory or elective. 21 programs have ‘Reverse Logistics’ as a separate course, all on elective basis. Table 3 shows the name, the class and credit hours of the courses.

Table 3: Separate ‘Reverse Logistics’ Course with its Class and Credit Hour

<table>
<thead>
<tr>
<th>Name of the Course</th>
<th>Class</th>
<th>Credit hours</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Logistics</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Reverse Logistics Management</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Green and Reverse Logistics</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Reverse and Green Logistics</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

As it is seen in Table 3, ‘Reverse logistics’ concept is included as a separate course mostly with the same name and as “Green and Reverse Logistics” and mostly in the 4th class as 3 credit hour basis.

Inclusion of ‘Reverse Logistics’ as a part of another Course
‘Reverse Logistics’ is included as a part (as weekly subject) of another course in 14 programs of 16 courses; it is included in 2 courses of 2 programs. It is mostly included in “Logistics Management”, “Introduction to Logistics”, “Green Logistics” and “Current Issues in Logistics” courses.

Inclusion of ‘Sustainability’ Concept in Curriculum
8 programs have 10 courses of ‘Sustainability’ concept as a separate course, all on elective basis. ‘Sustainability’ is included as a part of another course in 9 programs of 10 courses.
CONCLUSION

The enterprises are realizing that green image and social responsibility may cause to sell their product at a higher price and they reconsider about their market position and business process due to this fact and the increasing concern about environment and energy conservation (Lee and Lam, 2012: 589). Logistics is very important for the continuation of production and consumption functions; if we consider sustainability as a tree regarding to the purpose of enterprises, it is possible to consider environmental approaches and green logistics as branches of sustainability (Musiad Research Report, 2015, 38). Many companies with high international awareness choose their suppliers from the firms who invested in green logistics, so making them also internationally recognized (p. 127).

Environmental issues such as global warming and climate change have serious impacts on daily lives which necessitate sustainability to accomplish environmental, social and economic performances of the organizations (Mavi, Goh and Zarbakhshnia, 2017: 2404). There is a pressure to decrease the destructive ecological and social effects, so businesses are leaded to implement sustainable reverse logistics systems. Many enterprises use reverse logistics activities for reusability of products and because they recognized that it is a competition advantage because of the good results of generating cost saving and revenue (Bulut and Deran, 2008: 339).

As the importance of ‘Reverse Logistics’ concept is increasing day by day, this paper analyzed its inclusion in curriculum of undergraduate logistics programs. There are 64 undergraduate logistics programs in Turkey and only 21 programs have ‘Reverse Logistics’ as a separate course, all on elective basis. It is one third of whole programs. It is also included as a part of another course in 16 courses of 14 programs. The inclusion of ‘Sustainability’ concept in curriculum is also examined; it is included in 10 courses of 8 programs as a separate course, all on elective basis and in 10 courses of 9 programs as a part of another course.

As it is mentioned several times in the study, the awareness about reverse logistics is increasing day by day. It is also important to train well equipped students, in other words future specialists, to work in logistics sector who have recognized the importance of reverse logistics and sustainability. The curriculums of logistics programs should be updated for inclusion of reverse logistics as a separate course. As reverse logistics provides cost advantages, the curriculums should also be supported with adequate accounting lessons to train the future logistics specialist candidates with the ability of calculating the costs.

It is suggested for future studies to examine the relationship between green logistics, reverse logistics and sustainability deeply and also taking opinions of the specialists and academicians about the inclusion of sustainability and reverse logistics, or another important topic that they will suggest as separate courses.

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REFERENCES


COMPARISON OF 2015 REVISED INTERNATIONAL ACCOUNTING EDUCATION STANDARDS (IESs) WITH 2010 PRONOUNCEMENTS

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Abstract
Public trust can be built by reliable financial knowledge and well educated and ethically acting accountants in accounting World. The International Accounting Education Standards Board (IAESB) establishes standards in Professional accounting education area and enhances education by developing and implementing International Education standards (IES). These standards help the competence of the global accounting profession to be increased and public trust to be strengthened. IAESB issued eight IESs that prescribing requirements for entry to professional accounting education programs, initial professional development of aspiring professional accountants and continuing professional development of professional accountants. In 2015 IAESB revised the standards which superseded the 2010 Handbook of International Education Pronouncements. In this study, the revised IESs are briefly compared in the scopes of Handbook of International Education Pronouncements 2010 and 2015.

Keywords: Accounting education, International Accounting Education Standards (IES), accounting profession.

INTRODUCTION

Accounting profession has been influenced by the requirements of the changing world and developments in accounting field. Accounting professionals should be well educated and keep themselves up to date with the latest developments to adopt the changes. Public trust can be built by reliable financial knowledge and well educated and ethically acting accountants in accounting World. International Federation of Accountants (IFAC), which is founded in 1977, is the global organization for the accountancy profession that serves the public interest by contributing the development of high-quality international standards and promoting to adoption and implementation of them and aims that “the accountancy profession be recognized as essential to develop strong and sustainable organizations and economies” (ifac.org, 2017a, 2017b). Reliable, ethical and well educated accounting professionals have important tasks on the process of disclosing reliable financial knowledge (Uyar, 2008: 80).

The International Accounting Education Standards Board (IAESB), a sub foundation of IFAC, establishes standards in Professional accounting education area and enhances education by developing and implementing International Education Standards (IES) which help the competence of the global accounting profession to be increased and public trust to be strengthened (iaesb.org, 2017). IAESB issued eight IESs that prescribing requirements for entry to professional accounting education programs, initial professional development of aspiring professional accountants and continuing professional development of professional accountants.
Before IAESB’s pronouncements of IESs, IFAC pronounced International Accounting Education Guidelines (IAEG) that stated of Professional Accounting Education Programme components in 1982 (Crawford, Helliar, Monk and Veneziani, 2014: 70). When newly constituted IAESB issued IESs 1-6 in 2003, these IAEGs were replaced by them. Then IES 7 and IES 8 were issued in 2004 (effective from 01.01.2006) and in 2006 (effective from 01.01.2008) respectively.


The Handbook of International Education Pronouncements, 2014 (Handbook, 2014) replaces 2010 edition of the Handbook of International Education Pronouncements. Some of the reasons that IAESB approved a project in October 2009 meeting to revise and redraft all 8 IESs were to improve clarity and to "clarify issues resulting from changes in the environment of accounting education and the experience gained from implementation of the Standards by IFAC member bodies" (Handbook 2014: 4).

One of the more significant changes to the Handbook 2014 (Handbook 2014: 3) is the addition of a new section that includes the newly revised IESs that have been approved by the IAESB, but are not effective at the time of the Handbook’s release. The 2015 Education Handbook (Handbook, 2015) replaces the 2014 edition and contains the newly revised and redrafted International Education Standards (IES) 1-6, the re-drafted IES 7, Continuing Professional Development (2014), IES 8, Competence Requirements for Audit Professionals (2008), and the revised Framework for International Education Standards for Professional Accountants and Aspiring Professional Accountants.

The scopes of the standards can be explained briefly as follows (Handbook of International Education Pronouncements, 2015):

IES 1- Entry Requirements to Professional Accounting Education Programs (effective from July 1, 2014) is about entry level requirements for entry to professional accounting education programs.
IES 2- Initial Professional Development – Technical Competence (effective from July 1, 2015) is about learning outcomes for technical competence.
IES 3- Initial Professional Development – Professional Skills (effective from July 1, 2015) is about learning outcomes for professional skills.
IES 4- Initial Professional Development – Professional Values Ethics, and Attitudes (effective from July 1, 2014) is about the learning outcomes for professional values, ethics, and attitudes.
IES 5- Initial Professional Development – Practical Experience (effective from July 1, 2015) is about the practical experience required that candidate professional accountants need to demonstrate by the end of Initial Professional Development.
IES 6- Initial Professional Development – Assessment of Professional Competence (effective from July 1, 2015) is about the requirements for the assessment of professional competence that candidate professional accountants need to be achieved by the end of Initial Professional Development.
IES 7- Continuing Professional Development (effective from July 1, 2014) is about “the continuing professional development required for professional accountants to develop and maintain the professional competence necessary to provide high quality services to clients, employers, and other stakeholders, and thereby to strengthen public trust in the profession”(p.88).
IES 8- Competence Requirements for Audit Professionals (effective from July 1, 2008) “prescribes competence requirements for audit professionals, including those working in specific environments and industries” (p. 101).
The aim of this study is to compare and examine the differences of the revised IESs. This study has focused especially on IES 2 Initial Professional Development – Technical Competence which explains learning outcomes.

**METHOD**

Scopes and main objectives of the IES 1, 3,4,5,6, and 7 of 2010 and 2015 editions are compared. Some highlighted statements are mentioned for both editions. Main requirements of *IES 2 Initial Professional Development – Technical Competence* are examined in both Handbook of International Education Pronouncements, 2010 and 2015. The differences are shortly stated at the end of the explanations of each IESs. IES 8 isn’t included in this study because it isn’t revised at the time of the Handbook 2015’s release.

**FINDINGS**

The scopes and some highlighted statements of each IESs are examined under the title:

**IES 1 Entry Requirements to Professional Accounting Education Programs**  
**2010 Edition**

In the scope of 2010 edition which was effective from 1 January 2005, the minimum entry requirement “should be at least equivalent to that for admission into a recognized university degree program or its equivalent” (Handbook, 2010: 35, par.6). It also says that the starting point of professional accounting education program can vary, for instance, “work experience or mature students, candidates joining the program recognize part way through their career” may be recognized by some programs (p.36, par. 9). The entry level should be sufficiently high to assure that an individual will be supposably successful in professional accounting education program (par. 10). For the length of degree programs, it is noted that the Bologna Declaration signed in 1999 supported to adopt undergraduate and graduate degrees where undergraduate degree should be at least three years to complete (p. 36).

**2015 Edition**

In 2015 edition which was effective from 1 July 2015, the IES explains about flexible access allowing principle for professional accounting education programs under the auspices of an IFAC member body “while ensuring that aspiring professional accountants have a reasonable chance of successful completion of professional accounting education programs” (Handbook, 2015: 26, par.3). It is stated that educational entry requirements shall be specified by IFAC member bodies for professional accounting education programs “which allow only to those with reasonable chance of successfully completing the program, while not representing excessive barriers to entry” and the rationale for the principles to be used when setting educational entry requirements should be explained (p. 27, par.8-9). In explanatory material of this IES it is stated that “when setting entry requirements, the IFAC member body may consider whether they are appropriate in each case, and are neither excessive nor trivial” (p. 30, A8). The purpose of avoiding excessive barriers is to allow access flexibility to professional accounting education programs, “not to dilute standards either of professional accounting education programs themselves or of the accounting profession; rather there is a range of entry and exit routes.

It can be said that 2015 edition allows flexible access but also underlies the requirements to successfully complete the program.

**IES 2- Initial Professional Development – Technical Competence**  
**Scope of 2010 Edition**

According to the 2010 Edition, IES 2 “prescribes the knowledge content of professional accounting education programs that candidates need to acquire to qualify as professional accountants (Handbook, 2010: 39)”. The aim of this IES is to ensure that candidates acquire enough advanced
professional accountancy knowledge to be able to function as competent professional accountants in a complex and changing environment.

**Scope of 2015 Edition**
According to the 2015 Edition, IES 2 "prescribes the learning outcomes for technical competence that aspiring professional accountants are required to achieve by the end of Initial Professional Development (Handbook, 2015: 33)."

Technical Competence is defined as the ability to apply professional knowledge to perform a role to a defined standard. IES 2 specifies the competence areas and learning outcomes that describe the technical competence required of aspiring professional accountants by the end of IPD. Competence area is described as "a category for which a set of related learning outcomes can be specified". Learning outcomes "establish the content and the depth of knowledge, understanding, and application required for each specified competence area" (Handbook, 2015:38).

**The content of professional accounting education in 2010 Edition**
The content should consist of (Handbook, 2010: 40,41);
- Accounting, finance and related knowledge;
- Organizational and business knowledge; and
- Information technology knowledge and competences.

Accounting, finance and related knowledge ensure the core technical basis essential to a successful career as a professional accountant. The topics may be different according to the sectors or locations. This part further integrates the knowledge, skills and professional values, ethics into the subject areas that all professional accountants need to study (p.43).

Organizational and business knowledge provides the context in which professional accountants work. A broad knowledge of business, government and not-for-profit organizations is necessary for professional accountants. This part provides prospective professional accountants equipped with knowledge of the environment in which employers and clients operate (p.43).

Information technology has turned the role of the professional accountant because of using information systems and exercising IT controls skills, and also playing an important role as part of a team in the evaluation, design and management of such systems.

**The subject areas that should be included in the ‘Accounting, finance and related knowledge’ component**
- Financial accounting and reporting
- Management accounting and control
- Taxation
- Business and commercial law
- Audit and assurance
- Finance and financial management
- Professional values and ethics

**The subject areas that should be included in the ‘Organizational and business knowledge’ component**
- Economics
- Business environment
- Corporate governance
- Business ethics
- Financial markets
- Quantitative methods
- Organizational behaviour
- Management and strategic decision making
The subject areas that should be included in the 'Information technology knowledge and competences' component:
- General knowledge of IT
- IT control knowledge
- IT control competences
- IT user competences; and
- One of, or a mixture of, the competences of, the roles of manager, evaluator or designer of information systems.

Competence areas listed in Learning Outcomes for Technical Competence are as follows (Handbook, 2015: 34-37):
- Financial accounting and reporting
- Management accounting
- Finance and financial management
- Taxation
- Audit and assurance
- Governance, risk management and internal control
- Business laws and regulations
- Information technology
- Business and organizational environment
- Economics
- Business strategy and management

It is mentioned that the names of suggested courses or subjects may not be same to the name of the competence area or, the learning outcomes associated with one competence area may be achieved across more than one course or subject (p. 40).

Professional accountants operate in a rapidly-changing and complex environment; it may be necessary to update professional accounting education programs regularly. Changes in legislation, regulations, and standards relevant to professional accountants should be taken account and it may be reviewed three to five years, or more frequently when necessary (p. 41).

As it is seen the knowledge content of professional accounting education programs have developed in time.

IES 3- Initial Professional Development – Professional Skills
2010 Edition
In the scope of 2010 edition which was effective from 1 January 2005, this IES “prescribes the mix of skills that candidates require to qualify as professional accountants” (Handbook, 2010: 47, par.1). Professional accountant candidates should acquire the following skills (p. 48-49):
- Intellectual skills (knowledge, understanding, application, analysis, synthesis and evaluation).
- Technical and functional skills (numeracy and IT proficiency, decision modeling and risk analysis, measurement, reporting, compliance with legislative and regulatory requirements).
- Personal skills (relate to the attitudes and behavior of professional accountants such as self-management, initiative, ability to adopt to change, professional scepticism, etc.).
- Interpersonal and communication skills (enable a professional accountant to work with others for the common good of the organization, receive and transmit information, form reasoned judgments and make decisions effectively).
- Organizational and business management skills (such as Strategic planning, decision making, the ability to organize and delegate tasks, leadership, professional judgment and etc.).
2015 Edition
In 2015 edition which was effective from 1 July 2015, the IES “specifies the competence areas and learning outcomes that describe the professional skills required of aspiring professional accountants by the end of Initial Professional Development” (handbook 2015: 45, par.3). This IES 3, IES 2 and IES 4, together, “specify the competence areas and learning outcomes that describe the professional competence required of aspiring professional accountants by the end of IPD”.
“Professional competence is the ability to perform a role to a defined standard” and it is the integration and application of technical competence, professional skills and professional values, ethics, and attitudes (p.48).

The competence areas of professional skills are (p. 48-49):
- Intellectual (the ability of a professional accountant to solve problems, to make decisions, and to exercise professional judgment).
- Interpersonal and communication (the ability of a professional accountant to work and interact effectively with others).
- Personal (personal attitudes and behavior of a professional accountant).
- Organizational (the ability of a professional accountant to work effectively with or within an organization to obtain the optimal results or outcomes from the people and resources available).

IES 4 - Initial Professional Development – Professional Values Ethics, and Attitudes

2010 Edition
In the scope of 2010 edition which was effective from 1 January 2005, this IES ”prescribes the professional values, ethics and attitudes professional accountants should acquire during the education program leading to qualification “(handbook, 2010: 53, par. 1). It stated that professional accountants should have detailed perception of the “potential ethical implications of professional and managerial decisions” (par.3).

It is stated that the required values, ethics and attitudes of professional accountants should be in conformity with the IESBA (International Ethics Standards Board for Accountants) Code (p.54, par. 14).

The coverage of values and attitudes in education programs (p.54-55, par.15):
- The public interest and sensitivity to social responsibilities;
- Continual improvement and lifelong learning;
- Reliability, responsibility, timeliness, courtesy and respect;
- Laws and regulations.

2015 Edition
In 2015 edition which was effective from 1 July 2015, the IES “prescribes the learning outcomes for professional values, ethics, and attitudes that aspiring professional accountants are required to demonstrate by the end of Initial Professional Development (IPD)” (Handbook, 2015: 56, par.1). It integrates relevant ethical requirements of integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour into professional accounting education and also “specifies the competence areas and learning outcomes that describe the professional values, ethics, and attitudes required of aspiring professional accountants by the end of IPD” (par. 4-5).

This IES requires that through professional accounting education programs, IFAC member bodies shall provide a framework of professional values, ethics, and attitudes for aspiring professional accountants to “exercise professional judgment and act in an ethical manner that is in the public interest “(p.57, par.9).

The competence areas are (p.57-58):
- Professional skepticism and professional judgement
- Ethical principles (such as knowledge and understanding of ethical concepts, particular ethical issues likely to be faced by all professional accountants, identify any apparent ethical implications and conflicts in their work or work environment and etc.-p.65)
Commitment to the public interest

In IESBA 2016 (Handbook 2016) it is necessary that a professional accountant shall comply with the fundamental principles of integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour. Both IAESB’s 2010 and 2015 editions require to comply with IESBA ethics codes. In 2015 edition it is insisted and competence areas are identified.

IES 5- Initial Professional Development – Practical Experience

2010 Edition

In the scope of 2010 edition which was effective from 1 January 2005, this IES “prescribes the practical experience IFAC member bodies should require their members to obtain before qualification as professional accountants (Handbook, 2010: 59, par.1). It is stated that the “balance between practical experience and academic study or studying for professional qualifications may vary from one qualification to another” (par. 5).

Some of the statements are as follows: “The period of practical experience in performing the work of professional accountants should be a part of the pre-qualification program” and should be “a minimum of three years” (p.60, par.10-11). It is also stated that “a period of relevant graduate professional education ..may contribute no more than 12 months to the practical experience requirement”.

“Experience leading to qualification as a professional accountant should be conducted under the direction of a mentor who is an experienced member of an IFAC member body” and it is stated that practical experience will be effective if the professional body or regulatory authority, the trainee, mentor and the employer work together Practical experience program should be “mutually beneficial to both the trainee and the employer and be developed together”. The gained practical experience record should be reviewed periodically by the mentor (P.61, par.18-19).

2015 Edition

In 2015 edition which was effective from 1 July 2015, the IES prescribes the practical experience which “refers to workplace and other activities that are relevant to developing professional competence” required of aspiring professional accountants by the end of IPD (Handbook, 2015, par.1,3).

Aspiring professional accountants should demonstrate that they have gained“technical competence, professional skills, and professional values, ethics, and attitudes necessary for performing a role of a professional accountant” (p. 72, par. 12). IFAC member bodies should measure practical experience by using one of these three approaches (p. 72,par. 13):

- Output-based (such as measurement of learning outcomes achieved in accordance with a competency map or reviews of a research project or reflective essay, etc.-p.75).
- Input base (they have limitations; are based on time, for example, hours spent on relevant activities, or total duration of practical experience-p.76).
- A combination of output-based and input-based approaches.

Practical experience of aspiring professional accountants should be recorded in a consistent form prescribed by an IFAC member body and supported by verifiable evidence; the practical experience supervisor should undertake a periodic review of the records of practical experience (p. 73, par.18-19). “IFAC member bodies shall establish appropriate assessment activities to assess that sufficient practical experience has been completed by aspiring professional accountants” (par. 20).

As it is seen practical experience conditions and monitoring is very detailed in 2015 edition.
IES 6- Initial Professional Development – Assessment of Professional Competence

2010 Edition
In the scope of 2010 edition which was effective from 1 January 2005, this IES “prescribes the requirements for a final assessment of a candidate’s professional capabilities and competence before qualification” (Handbook, 2010: 65, par.1).

“The professional capabilities and competence of candidates should be formally assessed before the qualification of professional accountant is awarded” which should be carried out by an IFAC member body or the relevant regulatory authority with substantive input from an IFAC member body (p. 66, par. 11).

The assessment of professional capabilities and competence should require (p.66, par.12):
- Significant proportion of responses of candidates should be in recorded form;
- Be reliable and valid;
- Cover a sufficient amount of the whole range of professional knowledge, professional skills, and professional values, ethics and attitudes for the assessment to be reliable and valid;
- Be made as near as practicable to the end of the pre-qualification education program.

2015 Edition
In 2015 edition which was effective from 1 July 2015, the IES “prescribes the requirements for the assessment of professional competence of aspiring professional accountants that need to be achieved by the end of IPD (Handbook, 2015: 80, par.1).

Requirements
- Formal Assessment of Professional Competence (to formally assess whether aspiring professional accountants have achieved an appropriate level of professional competence by the end of IPD),
- Principles of Assessment (to design assessment activities that have high levels of reliability, validity, equity, transparency, and sufficiency within professional accounting education programs),
- Verifiable Evidence (to base the assessment of the professional competence of aspiring professional accountants on verifiable evidence).

In 2015 edition there are much explanations about assessment types, validity of assessment, ways to increase validity, ways to increase equity, ways to increase transparency, ways to design assessment activities increase sufficiency.

IES 7- Continuing Professional Development

2010 Edition
In the scope of 2010 edition which was effective from 1 January 2006, this IES “is based on the principle that it is the responsibility of the individual professional accountant to develop and maintain professional competence necessary to provide high quality services to clients, employers and other stakeholders” (Handbook, 2010: 70, par. 2).

Some highlighted statements are as follows:
- "Member bodies should promote the importance of continuous improvement of competence and a commitment to lifelong learning for all professional accountants (p.72, par.13).
- Member bodies should facilitate access to CPD (Continuing Professional Development) opportunities and resources to assist professional accountants in meeting their responsibility for lifelong learning” (p.72, par.16).
- “Member bodies should require all professional accountants to develop and maintain competence relevant and appropriate to their work and professional responsibilities” (p.72, par.18).
- “Member bodies operating an input-based approach should require the professional accountant to (p.75, par.33)
- a.- Complete at least 120 hours or equivalent learning units of relevant professional development activity in each rolling three-year period, ( 60 hours or equivalent learning units should be verifiable),
b- Complete at least 20 hours or equivalent learning units in each year,
c- Track and measure learning activities to meet the above requirements”.
  - “Member bodies implementing an output-based approach should require the professional
    accountant to demonstrate the maintenance and development of relevant competence by
    periodically providing evidence that has been objectively verified by a competent source and
    measured using a valid competence assessment method” (p. 75, par. 36).
  - “Member bodies should establish a systematic process to monitor whether professional
    accountants meet the CPD requirement and provide for appropriate sanctions for failure to meet
    the requirement, including failure to report or failure to develop and maintain competence” (p.76,
    par.42).

2015 Edition
In 2015 edition which was effective from 1 January 2014, the IES “prescribes the CPD required
for professional accountants to develop and maintain the professional competence necessary to
provide high quality services to clients, employers and other stakeholders and thereby strengthen
public trust in the profession” (handbook, 2015: 88, par.1).
While most of the statements are similar to 2010 edition, 2015 edition is prepared more
systematically and especially access to CPD (Continuing Professional Development) and
mandatory CPD for all professional accountants topics are explained more detailed.

IES 8- Competence Requirements for Audit Professionals
This IES “prescribes competence requirements for audit professionals, including those working in
This standard isn’t included in this study because it isn’t revised at the time of the Handbook 2015’s
release.

CONCLUSION
McPeak et al.(2012) state that there may be difficulties in developing globally applicable set of
international accounting education standards because of differing cultures, languages, social and
legal systems, but accounting educators can also help to meet this problem by some efforts such as
researching the issues addressed by the IAESB and using IAESB standards in developing and evolving
accounting education programs.

Accounting education should provide accounting candidates with technical knowledge and practice;
therefore the education program should be continuously developed within the frame of certain
standards (Yürekli and Gönen, 2015: 313). Gökten and Gökten (2016) evaluated the validity of
International Accounting Standards with regards to Turkey and found that IES 1, 4, 5, 7 and 8 are
completely valid, IES 2 and IES 6 are partially valid and IES 3 is not valid in Turkey. It is necessary to
continue to comply the accounting education with the International Accounting Standards to educate
competent and ethically acting accountants. Ethics should also be included in university curriculums to
underlie ethical consciousness during undergraduate education because it is a productive period that
the cognitive skills can be developed rapidly (Çubukçu, 2012: 114). Professional bodies should also
offer opportunity for the members of accounting profession to reach the continuous professional
education activities (Hacırüstemoğlu, 2009: 24).

As it is seen in the comparison of 2010 and 2015 edition of Handbook of International Education
Pronouncements, the knowledge content of professional accounting education programs develop in
time. It is revised to prescribe learning outcomes for technical competence. Also other standards are
revised to more detailed and interpretive form and explained more systematically.
Universities should consider the education standards while designing or updating their accounting curriculum. Accounting member bodies should contribute to continuing development by offering constructive activities.

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**REFERENCES**


THE ANALYSIS OF CONCEPTUAL DEVELOPMENT OF STEM EDUCATION BY BIBLIOMETRY

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Abstract
Bibliometric methods were presented important information to define characteristic specifications of scientific studies. Especially, STEM education's (which has growing popularity in recent years) place in literature and defining of its development's direction have importance for people studying in this area. For this purpose, 2584 scientific article was scanned from Web of Science (WoS) database with STEM keyword between 1990 and 2017. HAMMER, which is a web based analyze server was used for bibliometric analysis. By using this software, results such as article count, most cited articles and authors, the authors with the most publications, the most popular journals were analyzed with STEM by relevant years.

Keywords: Bibliometric, STEM, Web of Science.

INTRODUCTION

Among the criteria that are considered when measuring the development levels of countries, science and technology that they produce take an important place. Considering also the input of the science produced to the country's economy, to catch up with the dizzying pace of current scientific studies is one of the responsibilities of countries not only of scientists. In the globalizing world, scientists are now signing scientific studies and projects between countries. Thanks to the internet, popular scientists, articles, or journals on a subject can be easily followed. The online structuring of traditional libraries regarding the access to information has made the access to information even easier. But it has also become important that scientists use the right methods to access the information they seek. At this point, bibliometry emerges as an important research area. Bibliometry is a research area of library and information science, in which bibliographic studies are carried out using quantitative methods (Pritchard, 1969). Bibliometry contributes to making important analyses regarding at what points the science was, is, and is going to be in scientific studies conducted. Bibliometric studies play an active role in determining the science policies of countries and many factors such as the number of publications, the number of citations, the characteristics of the published journals in the studies of the countries, and whether these publications are patented or not are addressed, examined and evaluated (AI et al., 2012). With the development of the internet technology, the concept of social network analysis has become an important issue. Various software for the social network analysis enables close observation of trends in the scientific world and allows the visualization of large datasets. Many variables such as publications, citations, common citation networks, authors or institutions cooperated with are examined in social network analysis studies conducted based on bibliometric data.

There are many bibliometric analysis studies in the literature. In the study of Yang and Liu (2017), biometric analyses were performed in SCI/SSCI indexes between 2000 and 2015 for flipped classrooms, in which course subjects were enriched with technological tools, such as video, etc.
Between 2011 and 2015, it was observed that the publication output tended to grow sharply. Çiftçi et al. (2016) aimed to create a map for scientific publications in the field of educational sciences and teacher education in Turkey. A bibliometric analysis was conducted with 7681 articles published in 32 different refereed journals between 2005 and 2014. As a result of the study, findings in the subjects such as “the average score of the author per article”, “the frequency of the words in the headings”, etc. were presented. In their study, Heradio et al. (2016) analyzed the most effective studies and the most investigated subjects related to virtual and remote laboratories. The bibliographic data of studies from Web of Science, Scopus, and GRC2014 were collected and analyzed with two important bibliometric approaches, scientific mapping and performance analysis. In their study, Fejes and Nylander (2014) performed analyses based on the bibliographic data obtained from articles sent to three popular journals in the field of adult education research between 2005 and 2012. In their study, Cheng et al. (2014) performed a bibliometric analysis of 324 articles on “workplace e-learning” published in academic journals and conference reports between 2000 and 2012 using the word analysis and text analysis methods. According to the study results, it was concluded that this subject could be divided into six basic research categories such as e-learning in the health sector and social media usage for e-learning. In their study, Hung and Zhang (2012) reviewed articles from the SCI/SSCI database on mobile learning, and twelve clusters and four fields were created using techniques based on text mining on article abstracts. In their study, Martin et al. (2011) analyzed new technological trends in education according to the data in the annual horizon report published between 2004 and 2014 and conducted a study on trends in this direction. Cancino et al. (2017) conducted a bibliometric analysis involving article studies in the field of computer and industrial engineering between 1976 and 2015. They aimed to reveal where the trend in this field would evolve in the future.

STEM (Science, Technology, Engineering, Mathematics) education is an educational approach that involves all the educational processes of science, technology, engineering, and mathematics from preschool to higher education, in which different disciplines are related to each other and challenging academic concepts are combined with lessons in the real world (Aydeniz, Çakmakçı, and Ertepınar, 2015; Lantz, 2009). The acquisition of an interdisciplinary point of view by students starting from the first years of their education and putting into practice the theoretical knowledge, thanks to STEM education, increase more the importance given to STEM education nowadays. In this context, countries can gain the ability to compete in the new world economy by supporting the development of STEM literacy between school, society, work, and global enterprise. The need for STEM education should not only be regarded as an economic investment that countries make to the future. Nowadays, the use of many computer-based applications in making individual and societal decisions, understanding medical diagnoses, and many other occupational levels has made it inevitable to have knowledge of STEM (National Research Council, 2011).

The aim of this study is to carry out a bibliometric analysis of the scientific studies carried out in the field of STEM between 1990 and 2017; therefore, to help researchers who will conduct studies in the field of STEM, which is expected to have a place in the educational policy of our country, and to express an opinion about the course of future studies to be conducted on STEM.

**METHOD**

The WoS database was used for reviewing scientific studies on STEM education. “Stem” was selected for the keyword to search and search for studies between 1990 and 2017 was done. When the search was done only with the keyword “stem” in the search field at WoS site, it was observed that the term “stem” was included in other scientific fields such as medicine. In this case, studies only in educational sciences were filtered by selecting “Education, Educational Research” from the Web of Science categories. In this way, the number of articles from about 500,000 was reduced to 2584. The data were saved with the “Save to Other File Format” option to convert the obtained results into the format used by the analysis software. For the bibliometric analysis, an open-source HAMMER web-based analysis server established within the project named “Nails Project” developed by Kunutas et al.
(2015) was used. The “Nails Project” was developed to perform statistical and social network analysis on citation data. In large datasets, the links between articles can be analyzed, and articles in the scientific literature can be systematically mapped.

**FINDINGS**

The data on the number of publications related to STEM education are presented in the graph in Figure 1. It is observed that studies conducted between 1990 and 2005 do not exceed 10 per year. Especially after 2010, there has been a significant increase in the number of publications, and it is observed that the year when the highest number of publications was made is 2016. Since the date of the study is the middle of the year 2017, the figure in the graph is lower in 2017 than the year before. However, it is clear from the graph that it will exceed 2016 figures at the end of the year. This tendency in the number of publications explains that in the upcoming years, the number of studies on STEM education will increase.

![Figure 1: Distribution of the publications on STEM education by years](image)
Authors who have the highest number of studies on STEM education are shown in the graph in Figure 2. Louis S. Nadelson from the University of Colorado is observed to be the author of the highest number of studies.

Figure 2: Authors with the highest number of publications in the field of STEM education

The graph in Figure 3 shows the authors who have been cited the most in STEM education. Charles Henderson and Adam V. Maltese are in the first two citation ranks.
It is an important step which journal to send a scientific study after completing one because making a publication in the most popular journals on the subject studied will cause the study to be cited more, in other words, acknowledged more. This subject is a process that researchers are meticulously focused on and must be well analyzed before sending a study to a journal. As can be seen from the graph in Figure 4, it is observed that publications that are published by being presented as a report at a conference among studies on STEM education are the leading. Conferences popular in STEM education are seen from this graph. The ASEE (The American Society for Engineering Education) conference is observed to be the conference at which the most popular publications are presented. The “Journal of Science Education and Technology” and “International Journal of Science Education” are among the most popular journals.
The most effective indicator of the reputation and importance of a journal in the scientific world is the impact factor. The most important variable that determines the impact factor is the number of citations received by publications of the journal. When the graph in Figure 5 is examined, the “International Journal of Science Education”, “Journal of Engineering Education”, and “Journal of Research in Science Teaching” are observed to be the three most cited journals on this subject.
Figure 5: The most cited journals on STEM education

The use of the correct keywords to search for a scientific study in databases such as WoS is important for listing the most appropriate studies in the first order from thousands of results. In particular, searching without using the correct keywords will make it difficult for researchers who are foreign to the literature to reach the desired results. An analysis of popular keywords related to STEM education is presented in the graph in Figure 6. Keywords such as "Stem", "Stem Education", and "Education" are observed to be the most popular keywords.
Figure 6: Popular keywords in the field of STEM education

Upon examining the graph in Figure 7, it is observed that the most cited keywords are “Stem”, “Science Education”, and “higher education”.
DISCUSSION AND CONCLUSION

Nowadays, the increase in the access to scientific databases with the development of the internet has also facilitated access to bibliographic information of scientific studies. Thanks to bibliometric methods, without the profound expertise in a scientific field, important information can be achieved about that field such as the number of publications and citations, characteristics of publishing journals, core publications, publishing trends, joint research themes, whether publications have a patent or not, and the aspect of research. Thus, analysis forms and social network analysis results give an in-depth view of the field of science being studied. In multi-disciplinary fields, the network analysis makes it possible to identify the interaction of citations and contributions from other disciplines. This allows the researcher to see how and from which publications the multi-disciplinary nature of the field is formed. In this respect, it is important to perform a bibliometric analysis on a multidisciplinary subject such as STEM. In this study, the bibliometric analysis and social network analysis of 2584 studies on STEM between 1990 and 2017 from the WoS database were performed. It is expected that the findings
obtained will guide researchers who will work on this subject. According to the findings obtained, it is thought that the STEM subject will continue to be popular in the next few years and it will rapidly show an increase especially after 2010. Researchers conducting scientific studies are advised to use the social network analysis software to get more closely acquainted with their own disciplines, because the rapid development of science, the diversity of study subjects, and the necessity of updating the nature of bibliometric studies make this obligatory.

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EXAMINATION OF STUDENT'S INTERESTS AND LEARNING PREFERENCES THROUGH TOTAL TALENT PORTFOLIO

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Abstract
The purpose of this study is to adapt the Total Talent Portfolio used in the Schoolwide Enrichment Model into Turkish and to examine the interests and learning preferences of 4th graders according to this portfolio. The study was conducted with the participation of 46 4th graders, 46 parents and 2 classroom teachers from Amasya. The data of this study which used descriptive research methods were analyzed through frequency and percentages. It was found that most of the students in the study group had great interest in science subjects, experiments and trip/observation activities. Within the context of the study, it was found that most of the students preferred the activities of experimenting, taking part in educational games, listening to speakers and using computers while learning something new. The results of the study showed that the Turkish version of Total Talent Portfolio was a reliable tool to be used in finding out the interests and learning preferences of primary students through multiple assessments. Further studies can develop different activities by using the total talent portfolio and analyze the effects of these.

Keywords: Interest, learning preference, total talent portfolio, primary students.

INTRODUCTION
Individuals are different from each other in terms of social, psychological, cultural and mental characteristics. Besides these differences, every individual has different interests, abilities, needs, developmental characteristics and learning methods. All these distinctive characteristics of an individual are defined as individual differences (Şahin, 2015). Describing the individual differences of students requires examining them in terms of various aspects (Aktepe, 2005). Detailed analysis of students’ characteristics in education is possible with individual recognition techniques. Individual recognition can be defined as the process of collecting students’ information systematically and consistently with the help of various tools/techniques, recording the information and making a significant and reliable decision by combining these (MEB, 2006). Recognizing and assessing the individual is important in terms of planning and presenting educational environments suitable for the individual. Students’ interests and needs should be found through suitable techniques and their interests and abilities should be developed in schools (Olszewski-Kubilius & Thomson, 2015). Renzulli (2005) stated that schools should be places in which all students’ abilities are developed and suggested that Schoolwide Enrichment Model environments suitable for their interests and talents, learning styles and preferences. In order to be able to present students could be adopted in places where traditional methods are used and there are disadvantageous student populations. Through “Total Talent Portfolio” in Schoolwide Enrichment Model, students’ strengths such as their interests,
talents and learning styles are analyzed and assessed (Renzulli, 2014; Renzulli & Reis, 2014; Renzulli & Renzulli, 2010).

Total Talent (TT) portfolio is structured with the questions "What are the strengths of students and how can we record this information? How can we use this information in the best way to develop students’ talents? (Renzulli, 2000). The general purpose of this portfolio is to bring together in a file the information about students’ strengths such as their interests, talents and learning styles (Renzulli, 2014; Renzulli & Reis, 2014) and to use this information in providing special services, enrichment groups and while making differentiated education plans in regular classes (Renzulli, 2000). TT portfolio can also be used in Renzulli Learning System, which consists of and internet based online student information system based on Schoolwide Enrichment Model (Renzulli & Reis, 2007). This system helps students to store their projects, images, internet connections, compositions and other studies. Thus, teachers and families can follow the developmental process of the children from this online portal (Renzulli, 2014). In the related literature, Renzulli & Reis have stated that TT portfolio is used as a data collection tool in stages of determining the services students should make use of such as special education, identification and assessing the gifted students. Renzulli and Reis (2007) stated that TT portfolio provides teachers information about the individual characteristics of students and this portfolio helps teachers in planning activities enriched according to students’ interests and talents. In addition, it has been emphasized in this study that TT portfolio may help teachers, families, guidance services in making decisions about secondary school, high school and university choices and students in career development. Renzulli and Reis (2014) also stated that the information obtained from TT portfolio could be used in preparing individual education program.

METHOD

Research Design
Descriptive model was used this study. In descriptive model, the current state of a subject is analyzed. Descriptive researchers are grouped in two as self-transference studies and observation studies (Özdamar, 1999). Self-transference research data were used in this study since information was taken from the students in the study group. In order to take information from different sources about the existing state and to analyze consistency, parent and teacher assessments were also analyzed as well as student assessments.

Participant
The study was conducted with the participation of 46 4th graders, 46 parents and 2 class teachers from Amasya.

Research Instrument
As data collection tool, Total Talent Portfolio (Purcell & Renzulli, 1998) used in the Schoolwide Enrichment Model was used in the study (Gentry & Mann, 2008). TT portfolio categories are; subject areas, interest areas, learning styles, styles of sharing, environment, working with others, personality perceptions, hobbies/activities, short/long term targets. This portfolio which has ranking, 3 or 4 graded and open-ended question types consists of three parts. In the first part, students assess themselves according to TT portfolio categories. In the second part, parents assessed their children according to TT portfolio categories. 1st and 2nd part portfolio items consist of the Turkish adapted form of Total Talent Portfolio (Cited from Gentry & Mann, 2008, Purcell & Renzulli, 1998). After TT portfolio items were translated into Turkish, they were applied on a small student group as pre-application. Within the context of adaptation, current subject area names were revised in the portfolio, the number of interest areas were increased and the responses of the items in this category were transformed into 3 Likert type as "not interested (1), somewhat interested (2), very interested (3)" because it was found in pre-application that some students had difficulties in ranking their interest areas and wanted to put a few interest areas in the first place. The 5 choices related to the learning environment in the original portfolio were decreased to 3 choices. For example, in the Turkish adaptation of the learning environment category, the light category was given as "there should be soft
light, it should be light but not too bright, it should be very light”. An expert’s opinion was taken about whether the related changes were suitable or not. In the third part prepared by the researchers, there are questions for teachers to assess the students about subject areas, interest areas, learning styles, working with others, personality characteristics, hobbies/activities, short/long term targets. For example, there are teacher assessments in this part such as: for the following activities, number the one your student loves the most with 1 and the second most loved one with 2. Similar to the other parts, this part has ranking items, 3 likert type items and open-ended questions.

As a conclusion, the TT portfolio which consists of 3 parts has 14 items (10 categories) for student assessment, 11 items (8 categories) for parent assessment and 13 items (8 categories) for teacher assessment. The pilot application of the portfolio was conducted with a total of 45 students, 45 parents and 2 classroom teachers in a state school of Amasya. At the end of pilot applications, the reliability value of interest areas category in student assessment was found as 0.80 in SPSS program (Table 1).

The results of expert assessments show that TT portfolios are reliable tools that can be used in the multiple assessment of individual differences such as interests and learning style.

Table 1: Student Responses of Interest Areas

|     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| S1  | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | S23 | 3 | 2 | 3 | 1 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | S24 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | S25 | 2 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 2 | 1 | 1 | 1 | 2 | 2 |
| S2  | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | S26 | 2 | 1 | 2 | 1 | 1 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | S27 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | S28 | 2 | 3 | 2 | 2 | 2 | 1 | 3 | 2 | 3 | 3 | 3 | 2 | S29 | 3 | 1 | 3 | 2 | 1 | 3 | 2 | 3 | 1 | 2 | 2 | 3 | S30 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | S31 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | S32 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 |
| S3  | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | S33 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | S34 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 3 |
| S4  | 2 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 2 | 2 | 3 | 3 | S35 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | S36 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | S37 | 2 | 1 | 3 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | S38 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 3 | 3 |
| S5  | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | S39 | 4 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 1 | 3 | 1 | 1 | S40 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | S41 | 2 | 1 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 1 | 1 |
| S6  | 2 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | S42 | 1 | 2 | 1 | 3 | 2 | 3 | S43 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 1 | 2 |
| S7  | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | S44 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| S8  | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | S45 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

(I1: drawing, I2: making video, I3:story, article, creative writing, I4: dancing, I5: singing, I6: researching historical events, I7: listening to music, I8: conducting science experiments, I9: technology,computer, I10: interest in subjects such as the Earth, the Sun, the Moon and space, I11: trip and observations, I12: acting)

When Table 2 is examined, it can be seen that 60% of the students stated that they were very interested in activities of scientific experiments, trip/observations,listening to music, 58% were interested in singing and acting, 57% were interested in drawing. 36% of the students stated that they were not interested in activities of making videos and 29% were not interested in dancing activities. When teacher assessments of students’ interest areas are examined, it can be seen that of the students, 16% are interested in scientific experiments, 15% are interested in technology and computers, 13% are interested in drawing, 13% are interested in creative writing, 12% are interested...
in music, 12% are interested in history, 8% are interested in geography, 6% are interested in dancing and 5% are interested in acting according to teachers. In technology and computers, 13% are interested in music, 12% are interested in drawing, 12% are interested in acting, 9% are interested in creative writing, 9% are interested in history and 8% are interested in geography according to parents. After students learned something new, 88% have positive attitude towards doing tests and 84% had positive attitude towards doing worksheets.

69% students want to form a model after learning something new and while 64% want to draw picture or graph. More than half of the students (51.1%) are undecided about sharing things about learning.

FINDINGS AND DISCUSSION

The responses related to subject areas, interest areas and learning styles in TT portfolio were examined in percentages and frequencies. Table 2 gives student responses for interest areas and Table 3 gives student responses for subject areas.

Table 2: Student Assessments of Interest Areas

<table>
<thead>
<tr>
<th>Interest Areas</th>
<th>Not interested</th>
<th>Somewhat interested</th>
<th>Very interested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawing</td>
<td>1 f, 2 %</td>
<td>16 f, 36 %</td>
<td>26 f, 57 %</td>
</tr>
<tr>
<td>Making video</td>
<td>13 f, 29 %</td>
<td>9 f, 20 %</td>
<td>19 f, 42 %</td>
</tr>
<tr>
<td>Writing story, article and poem</td>
<td>6 f, 13 %</td>
<td>20 f, 47 %</td>
<td>24 f, 53 %</td>
</tr>
<tr>
<td>Dancing</td>
<td>3 f, 7 %</td>
<td>9 f, 20 %</td>
<td>27 f, 60 %</td>
</tr>
<tr>
<td>Singing</td>
<td>6 f, 15 %</td>
<td>13 f, 29 %</td>
<td>24 f, 53 %</td>
</tr>
<tr>
<td>Researching historical events</td>
<td>8 f, 20 %</td>
<td>18 f, 40 %</td>
<td>19 f, 42 %</td>
</tr>
<tr>
<td>Listening to music</td>
<td>8 f, 18 %</td>
<td>18 f, 40 %</td>
<td>19 f, 42 %</td>
</tr>
<tr>
<td>Making scientific experiments</td>
<td>9 f, 20 %</td>
<td>9 f, 20 %</td>
<td>27 f, 60 %</td>
</tr>
<tr>
<td>Technology/computer</td>
<td>9 f, 20 %</td>
<td>19 f, 42 %</td>
<td>17 f, 38 %</td>
</tr>
<tr>
<td>Reading about the earth, sun, moon, space</td>
<td>9 f, 20 %</td>
<td>9 f, 20 %</td>
<td>27 f, 60 %</td>
</tr>
<tr>
<td>Trip &amp; observation</td>
<td>8 f, 18 %</td>
<td>11 f, 24 %</td>
<td>26 f, 58 %</td>
</tr>
<tr>
<td>Acting</td>
<td>8 f, 18 %</td>
<td>18 f, 40 %</td>
<td>26 f, 58 %</td>
</tr>
</tbody>
</table>

When Table 3 is examined, it can be seen that most of the students had positive attitudes towards physical education (94%), mathematics (93%), and science (89%), while 38% were undecided or had negative attitudes towards English. Students’ interests are different from each other. Profile cards were made for each student in order to be able to use the information obtained more efficiently.

When student assessments of learning styles are examined, it can be seen that the methods through which the students think they learn the best are experiments (15%), instructive games (13%), speakers (13%), computers (13%) and reading (11%) activities. 10% of the students prefer learning with video, 9% prefer working together, 7% prefer learning through cd/tape. When parent
assessments of students' interest areas are examined, it can be seen that of the students, 15% are interested in scientific experiments.

When the parent assessments are examined, it can be seen that according to parents, when students learned new things, 16% preferred to learn with experiments, 14% preferred to learn with reading, preferred to learn with instructive games, 12% preferred to learn with computer, 10% preferred to learn by working together, 9% preferred to learn with speakers, 5% preferred to learn with video, 8% preferred to learn by watching others and 8% preferred to learn with cd/tape.

When teacher assessments of students' learning styles are examined, it can be seen that, according to teachers, 16% of the students preferred to learn through reading, 16% with instructive games, 15% with experiments, 12% with computers, 9% with video, 9% by working together, 9% with speakers, 8% with cd/tape and 6% by watching others.

Table 4 are given the profile card of the student named S1 who was chosen randomly.

Table 4: Profile Card of the Student Named S1

<table>
<thead>
<tr>
<th>Student assessment</th>
<th>Parent assessment</th>
<th>Teacher assessment</th>
<th>Student assessment</th>
<th>Parent assessment</th>
<th>Teacher assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drawing,</td>
<td>Books on jokes,</td>
<td>Drawing,</td>
<td>Loves to work</td>
<td>My child does not</td>
<td>Loves to work with</td>
</tr>
<tr>
<td>scientific</td>
<td>drawing,</td>
<td>scientific</td>
<td>to work with an</td>
<td>like working alone</td>
<td>an adult</td>
</tr>
<tr>
<td>experiments,</td>
<td>scientific</td>
<td>experiments,</td>
<td>adult</td>
<td></td>
<td></td>
</tr>
<tr>
<td>trip/observation,</td>
<td>drawing,</td>
<td>creative writing,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mathematics,</td>
<td>scientific</td>
<td>theatre,science</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>science</td>
<td>experiments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working style</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loves to work with</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>an adult</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning styles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading,</td>
<td>Experiments,</td>
<td>Experiments,</td>
<td>Defined herself</td>
<td>Talkative, asks</td>
<td>Cheerful,</td>
</tr>
<tr>
<td>computer</td>
<td>working together,</td>
<td>working together,</td>
<td>as gentle and</td>
<td>too many questions,</td>
<td>hardworking,</td>
</tr>
<tr>
<td>activity,</td>
<td>computer activity</td>
<td>computer activity,</td>
<td>intelligent</td>
<td>humorous,</td>
<td>leader,</td>
</tr>
<tr>
<td>experiments,</td>
<td></td>
<td>instructive games</td>
<td></td>
<td>expresses herself</td>
<td>emotional</td>
</tr>
<tr>
<td>watching video</td>
<td></td>
<td></td>
<td></td>
<td>well.</td>
<td></td>
</tr>
<tr>
<td>Personalty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defined herself as</td>
<td></td>
<td>Defined herself as</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gentle and</td>
<td></td>
<td>gentle and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>intelligent</td>
<td></td>
<td>intelligent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Styles of sharing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The student likes</td>
<td>Making experiments</td>
<td>Reading books,</td>
<td></td>
<td>running,</td>
<td></td>
</tr>
<tr>
<td>to share learning</td>
<td>drawing,</td>
<td>puzzles and</td>
<td></td>
<td>swimming,</td>
<td></td>
</tr>
<tr>
<td>products by:</td>
<td>reading,</td>
<td>journey books,</td>
<td></td>
<td>doing sports</td>
<td></td>
</tr>
<tr>
<td>acting, making a</td>
<td>drawing,</td>
<td>reading,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>model, drawing</td>
<td>playing chess,</td>
<td>running,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pictures or graphs,</td>
<td>taking journeys</td>
<td>swimming,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>explaining and</td>
<td></td>
<td>drawing dresses,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>discussing,</td>
<td></td>
<td>watching the TV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>answering tests</td>
<td></td>
<td>program named</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Student assessment)</td>
<td></td>
<td>science in the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>backyard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continually quiet,</td>
<td>To get the honors</td>
<td>To get a degree</td>
<td>To finish the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>light but not very</td>
<td>and to get a</td>
<td>in the exams and</td>
<td>term successfully,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bright and warm</td>
<td>tablet for this</td>
<td>to get a place at</td>
<td>to get a place at</td>
<td></td>
<td></td>
</tr>
<tr>
<td>learning environment (Student assessment)</td>
<td>year.</td>
<td>science high school.</td>
<td>science high school and</td>
<td>to be a doctor.</td>
<td></td>
</tr>
<tr>
<td>Hobbies, activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To get the honors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and to get a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tablet for this</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>year.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 4 is examined, it can be seen that S1 has an interest in science and mathematics, likes to learn through experiments or computer activities while learning and wants to express the products caused by learning through acting, modeling, drawing and explanation and discussion. The assessments show that S1 likes to read books of joke, puzzle, travel books, to run, to swim, to draw a dress and watching the program Science in the Backyard.

Table 5 is given student assessments of working styles.
Table 5: Student Assessments of Working Styles

<table>
<thead>
<tr>
<th>Working Style</th>
<th>Positive</th>
<th>Undecided</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working alone</td>
<td>27</td>
<td>60</td>
<td>14</td>
</tr>
<tr>
<td>Working with a friend</td>
<td>25</td>
<td>56</td>
<td>17</td>
</tr>
<tr>
<td>Working with an adult</td>
<td>25</td>
<td>56</td>
<td>15</td>
</tr>
<tr>
<td>Working with a small friend group</td>
<td>19</td>
<td>42</td>
<td>15</td>
</tr>
<tr>
<td>Working with the whole class</td>
<td>27</td>
<td>60</td>
<td>6</td>
</tr>
</tbody>
</table>

When Table 5 is examined, it can be seen that 60% of the students consider it suitable to work alone, 56% with a friend, 56% with an adult and 60% with the whole class.

CONCLUSIONS AND SUGGESTIONS

This study has adapted Total Talent Portfolio, which consists of open-ended, ranking and likert type questions, into Turkish. Within this context, the reliability coefficient of the interest areas category was found as 0.80, and expert views were taken on learning styles and other categories. The results of the expert analysis showed that the Turkish version of Total Talent portfolio is a reliable tool that can be used in determining the general interest areas and learning styles of students. In addition, it was found that the results of the assessments of students, parents and teachers were greatly consistent with each other.

When the results of the interest areas category were examined, it was found that most of the students in the research group had more interest in scientific experiments and trips/observations than all the other areas (Table 3). This result is similar to the results of Eke's (2010) study. In Eke’s (2010) study, it was found that students in Turkey had a great interest in scientific subjects and they had positive attitudes towards science. The reason for this result may be the fact that science makes students curious and excited and students are active in experiments. At this point, what is important is that students develop these strong aspects (Renzulli, 2014; Renzulli & Reis, 2014; Renzulli & Renzulli, 2010). Thus, the science literacy of the students in the research group should be supported, different science activities should be developed for these students and extracurricular learning environments should be presented to them. Further studies can thoroughly examine on which science subjects students have more interest. According to the results of the study, most of the students prefer to make experiments and participate in instructive games while learning something new. When these preferences are considered, it can be said that students are more active and they prefer to learn through methods of working together. The reason for this result is that experiments cause students to experience feelings of exploration and they are motivating (Dede, Clarke, Ketelhut, Nelson & Bowman, 2005) and instructive games enable students to work with their friends in small groups and thus enable them to interact with each other and thus take part in a working environment which makes them feel independent. Kim (2008) emphasized that the information related to these dimensions is important since both teachers and researchers use it in primary school. According to this classification, it can be said that most of the students in the research group want peer supported teaching and teaching with problem solving activities. In peer supported teaching, instructive games can be played and in problem based teaching, different experimental environments can be presented to students. When studies about learning styles conducted in our country are examined, the small number of studies in primary schools is remarkable (İflazoğlu Saban & Arslanhan, 2015). Learning styles of primary school students should be examined in terms of subjects and students should be given activities suitable for their learning styles.

When the students’ working preferences were examined, it can be seen that the percentages of working alone, working with friend, an adult and the whole class are close to each other (Table 5). Consequently, some students prefer to work alone, while some others prefer to work with an adult and some prefer to work with the whole class. The reason for this is the differences in learning styles.
Individual assessment of all the information gathered from the portfolio should be assessed individually allows for the more efficient use of the information gathered. For example, when the student, parent and teacher assessments of S1 code are examined, it can be seen that this student does not like to work alone, but likes to work with an adult/peer. Thus, this student should be given environments in which teaching methods with peers based on Renzulli, Rizza, Smith’s (2002) classification. Peer supported method is a method in which the individuals are both teacher and student and also peer, or the teacher has the role of either just teacher peer or just learner peer (Burnette, 1999) and Burnette (1999) reported that this method aimed to develop the academic and social skills of students and increased students’ self-respect.

According to the results of the study, it was stated that the student named S1 has an interest for drawing (Table 4). When Table 4 is examined, it can be seen that S1 has an interest in science and mathematics, likes to learn through experiments or computer activities while learning and wants to express the products caused by learning through acting, modeling, drawing and explanation and discussion.

The assessments show that S1 likes to read books of joke, puzzle, travel books, to run, to swim, to draw a dress and watching the program Science in the Backyard. Parent and teacher assessments are very similar, too. Based on these results, S1’s talents of drawing and picturing can be developed with independent projects and studies to make models and drawing/picturing activities should at least be integrated with computer assisted education. Thus, various chances should be given to students to develop this skill at home or at school.

When the product sharing status of students in the study group after learning something new were examined, it was found that 88% of all the students had positive attitudes towards doing tests, while 84% had positive attitudes towards doing worksheets. The fact that the students had a habitual for doing tests and study pages as a result of the methods applied by class teachers can be the reason for this question. Students should be given opportunities to conduct new studies which will help them to become more active such as modeling, graphic drawing, preparing research reports, forming discussion groups and participating in project researches. At this point, the class teacher has a great duty. Classroom teachers should plan the content, process and product dimensions of differentiated activities for students according to students’ interests, talents and learning styles; and necessary opportunities should be given to students to enable that the products they created as the results of learning are different, unique and creative.

This study has some limitations. First of all, this study is a pilot study which is conducted to adapt the TT portfolio into Turkish. The results of the study cannot be generalized beyond the group in the study. Secondly, this study is limited to TT portfolio information. Studies about interest and learning preferences can be examined in different student groups in terms of observation and interviews.

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REFERENCES


THE ROLE OF MUSIC LESSONS IN THE VERSATILE EDUCATION OF PRIMARY SCHOOL STUDENTS

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Abstract
This paper will discuss the role of music lessons in the versatile education of primary school students. The goal is to determine how music lessons contribute not only to music education but also to the versatile education and harmonious development of students' personality. In primary school, music lessons should primarily contribute to music education of students. However, music lessons and activities enable the adoption of not only music knowledge, skills and habits, but also the development of the overall physical and spiritual potentials of students. The study tasks in this paper aim to determine whether there is a possibility to adopt intellectual, physical, moral, working, aesthetic, and ecological knowledge during music lessons. This paper should indicate the educational value of music lessons in the process of personality development of primary school students, as well as the manifestation and cultivation of music potentials in each individual student.

Keywords: Music lessons, versatile education, students, primary school.

INTRODUCTION

Modern education requires a versatile, harmonious, free and authentic personality development that will be able to keep up with and understand the needs of the modern society, to adapt to them, and to consciously participate in all aspects of socio-economic, cultural and educational development of the society. Education achieves its full meaning only in the dialectical unity and connection of all the aforementioned components of education, to which in this paper we will also add music education, which is also an essential factor for the versatile development of students' personality. Modern society, therefore, requires individuals trained in intellectual, physical, moral, working, aesthetic, ecological and musical views, as these are seen as the prerequisites of a successful and quality life in a given social environment. In the modern primary school education system, music lessons have an invaluable role and importance in the musical and versatile development of students' personality. Music lessons are focused on the development of students' music abilities, but also on the development of intellectual potentials and the adoption of moral and aesthetic values. This is enabled by the material taught in music lessons: songs, dances, songs for listening and dancing, lessons which promote universal values contributing to the development of all the positive psychological and physical characteristics and personality strengths, encouraging harmonious and humanistic personality development.
EXPLANATION OF THE VERSATILITY OF PRIMARY SCHOOL STUDENTS AND MUSIC

The term versatile education was first mentioned during the nineteenth century, in the works of Marx and Engels and their discussions on education, as “the basic meaning and goal of every future education in a socialist and communist society” (Pedagogical Encyclopedia 2, 1989:8). The Marxist view of education sees the versatile personality opposing the one-sidedness which was the consequence of the division of labor and division of society into classes, with one part of the society preparing for the mental and the other part for physical work. In overcoming such divisions, education was supposed to significantly affect the equal development and manifestation of the overall spiritual and physical potentials of each individual. In the modern age as well, versatility is an important goal of the education process and an essential prerequisite for lifelong education, which is emphasized by the modern society. The versatile development of personality during the learning process is achieved through the intellectual, moral, aesthetic, physical, work and ecological education, enabling the intensive development of each individual in given social conditions. According to Jovanovic (2005: 23), the versatile personality development implies the “growth and development of spiritual and physical aspects, creative abilities, individual talents and the integral development of physical, intellectual, voluntary and emotional dimensions of personality”. Versatility, however, should not be understood as unidirectional, as only the education goal which is strived for, but rather as the “generic characteristic of man” (Trnavac, 1996: 141). In a certain way, versatile education requires accountability to the human nature and its potentials that man inherits and carries in himself. In that sense, versatile education is, as the author points out, accountable both to the past, and to the future. While interpreting the notion of versatility according to Potkonjak, Jovanovic (2005: 23) emphasizes that versatility should embed universal values (societal, humane, generic, social, cultural), specific values (socio-historical) and individual values (individual, personal), and it is reflected in the unity of all the components of education. The effect of music on people was recognized in the original human society. Later on, in ancient Greece, the word music signified the entire development of spiritual life. “A music man was seen as an educated man” (Marinkovic, 1995: 7). Plato believed that music should be the basis of the entire education of man. In his view, “nothing penetrates the soul like rhythm and melodies, making it beautiful. Music is, therefore, the most advanced form of education” (Plato, 1939: 29). Contemporary science unambiguously highlights the extraordinary developmental importance of music. Namely, it has been proven that the child's music development starts in the prenatal period, and that early muscle stimulation contributes to the rapid development of brain functions and psychomotor abilities (Mirković-Rados, 1996: 237). Sound is the main information channel in the uterus. Research shows that listening, playing and making music in pregnancy affects the physical development of many regions in unborn babies brains, such as the auditory cortex region, sensory area, motor coordination (Weinberger, 2000: 399–402), thus, after birth, children recognize and love the music they were exposed to in the prenatal period (Levitin, 2011: 248). American music pedagogue and researcher Donald Shetler was researching the development of children who were exposed to music in the prenatal period - through their mothers’ everyday singing, or listening to music in pregnancy. The research has established the rapid music development of such children. “They would sooner have some music reactions; they would sooner pay attention to the sound effects from the environment; they would more correctly imitate the voice of adults and other sounds from the environment; they would sooner start vocalizing compared to the children who were not exposed to music in the prenatal period” (Mirković-Rados, 1996: 238). Don Campbell's research results on the effect of listening to Mozart's music are very interesting. Campbell concludes that listening to Mozart's music “allows for communication and connection between the mother and the child even before birth; it stimulates the development of the baby's brain in the mother's stomach, but also during early childhood; it positively affects the emotional perceptions and attitudes of children; it reduces the level of emotional stress and physical pain; it enhances the development of motor skills by which the child learns to crawl, walk, jump and move; it enhances linguistic abilities and communication skills; it improves the child's social skills and contributes to the development of their own identity” (Campbell, 2002: 8). In his second book, The Mozart Effect, Don Campbell presents the research results that emphasize the great significance and influence of music on “human feelings, breathing, muscular
INTELLECTUAL EDUCATION IN PRIMARY SCHOOL MUSIC TEACHING

A well-rounded educated person who respects universal humanistic values is expected to understand “human relationships in a society, to realistically perceive and understand his/her own position in the national and global social community, and to possess a developed sense of responsibility for the advancement of mankind” (Herera, Mandić, 1989: 242). Only a well-rounded person, motivated by the humanistic vision of education, can keep up with and understand the development trends of the modern society which are based on democratic, multicultural, multiconfessional, multiethnic, libertarian, universal and general human aspirations and ideas. In pursuit of these goals, music teaching is the backbone of education. When one mentions music, the first thought for many people is music performance - playing, singing, listening to music, and rarely would anyone relate these activities to intellectual abilities. On the other hand, it is clear that great musicians are characterized not only by music talent, but also by highly developed mental and psychomotor abilities: concentration, attention, memory, mental stamina, creative ability and others. Music performances in primary schools imply the engagement of not only the music abilities but also the intellectual abilities of students. Since music is “the art received by hearing and experienced by the spirit” (Despić, 1997: 11), active listening to music, as well as other music activities, engages not only the emotions, but also “thought processes as well as the creative potentials of a person” (Grandić, Joković, 2014: 185). Pure music, the authors say, is not an abstract art that can only be understood and felt by gifted people, but it is the art which all young and adult individuals who have acquired certain music experience and knowledge can enjoy and use to improve their own development. In that sense, Ivanović (2007: 5) points out that music is “the mother tongue of man as a musical being, and the authentic medium of human expression which helps him learn in a motivated way, with pleasure and challenge, mastering analytical, critical and creative thinking”. Music and intellectual abilities at the music lessons are activated and displayed in parallel, supporting and complementing each other, same like the entire music and intellectual development of man which is taking place simultaneously, from man’s conception. “Intellecual education has a multifaceted role in personality formation, one being that is the essence of the whole education process” (Kruļ et al., 2003: 95). If we can enable students to adopt the knowledge system and to steer their intellectual development, “we will in fact provide the foundation for other components of education”. (Dordević, Jovanović, 1996: 157). The main tasks of intellectual education are: “acquiring knowledge, building skills and habits, and creating the basis for the formation of worldviews; developing intellectual strength and abilities; developing the culture of intellectual work; motivating students to learn, self-educate and self-develop themselves” (Jovanović, 2005: 45). The fulfillment of these tasks is undoubtedly aided by music material and music activities in music lessons. Although music lessons in schools are based on the music experience, intellect is very important to be able to discern its expressive elements and to clarify the experience, which ”cannot be observed separately from the sensual perception of music” (Ivanović, 1981: 148). In music lessons in schools, students are supposed to adopt a certain amount of knowledge, skills and habits regarding
music playing, as well as elementary knowledge of music theory, through the areas defined by the curriculum, which are: knowledge and understanding, listening to music, performing music and music creativity. These four interdependent areas should enable the student to become acquainted with music art, that is, to get acquainted with all vital dimensions of music, through personal experience or active music playing.

During the music activities, students use numerous mental abilities and psychological functions: observation, attention, memory, thinking, imagination, emotions, analysis, comparison, deduction. Listening to the selected music compositions, the students observe the sound of music instruments, the music piece form, the expressive elements of music (tempo, dynamics, rhythm, harmony, melody, agogic, etc.). When singing by ear, students observe the character of the melody, linking it to the text, they direct their attention to a common start and a common ending when singing, they follow the required tempo, dynamics, voice shaping, they pay attention to diation and correct accentuation, proper phrasing, as well as breathing. When learning a music piece from a sheet music, students focus on recognizing notes, precise reaching of tone height while also adjusting the rhythm and text, with simultaneous hand movements in line with the rhythm, which requires extraordinary attention and concentration. When playing on various children's music instruments (rhythm and melody), students observe their timbre, the materials which they are made of, the focus on mastering the playing technique, and direct the attention and focus on the synchronization between playing and singing. Attention and focus are also required when playing music games, when it is necessary to synchronize the steps or other movements with the text and the melody of the song. When we talk about music lessons, we often encounter the term musical memory, which means "the ability to retain, reproduce and recognize meaningful music elements such as motifs, phrases and larger formations" (Music encyclopedia 2, 1974: 652). The goal of music teaching is to introduce the students with great works of music art, and to ensure that knowledge lasts, since those are valuable teaching materials. Listening to different compositions and repeating them should contribute to the development of memory and durability of music knowledge, as the goal is to make music an integral part of the learner's personality. Listening to a music piece as a whole, it can trigger different feelings and imagination in students, depending on the theme and character of the composition. At the younger school age, students slowly and gradually become able to express their opinion on the composition heard, as well as to notice and comment on the connection between the character of music and the expressive music elements, which contributes to the development of logical thinking.

When we are talking about the skills, we know that they are created by practicing certain practical operations, while in music those operations are singing, playing, performing and creating. To what extent will the students successfully participate in such cultural and music groups, depends on the development of their performance skills acquired through an eight-year old music education. It is important to point out that when it comes to the skills, a particularly important principle is that of the conscious activity, which is present in all music activities - singing, playing, listening to music, or in music creativity. With frequent repetition and practice of these skills, a habit of beautiful and well-shaped singing, harmonious music playing or listening to artistically valuable compositions is developed. Frequent repetition and practice of songs, music games, playing on children music instruments will develop in students the certainty in their own musical, mental, psychomotor and physical abilities. Successful music activities contribute to the development of interest in music, and to the development of habits and the need for art in everyday life. The quality of the music knowledge acquisition process and its use in everyday life also depends on the level of mastering the culture of intellectuality. Modern teaching is increasingly demanding the use of modern information and communication technology in teaching, teaching the students how and encouraging them to use the Internet resources, such as Wikipedia and YouTube, different music programs will contribute to the students' independence in acquiring knowledge, developing their creativity, inventiveness, initiative, interest in music art and getting to learn about it. Students should be allowed to "choose themselves the compositions they would like to listen to" (Stojanović, 1996: 116), which contributes to their self-confidence and self-esteem. In correlation with IT classes, it is necessary to train students how to download audio recordings from YouTube, which students will then suggest to listen in music lessons.
This approach shows to the students that they are trusted and their desire to participate in the teaching process is encouraged, which contributes to a more dynamic and successful teaching. In primary schools classes, students are only introduced to a part of local and international classical and traditional music, so they should be encouraged to listen to classical music pieces even after their primary education, being aware of their high artistic value. This will certainly contribute to new knowledge and experiences, self-education and self-development of students.

MORAL EDUCATION IN PRIMARY SCHOOL MUSIC TEACHING

Listening to music is of exceptional importance and significance for moral education. Music has always drawn the attention of not only artists, but also philosophers, aestheticians, sociologists, culturologists, psychologists, and pedagogues. The opinion of the first Greek thinkers “was related to the problems imposed by nature (phisis), and it is no coincidence that, these thinkers, especially Pythagoreans, started thinking about music and its place in the world, and believed that music had a worldly, cosmic meaning” (Uzelac, 1998: 25). Its ethical and aesthetic properties were particularly emphasized. Socrates, Plato and Damon recognized the connection between the world of tones and the political practice, believing that the principles of music cannot be disrupted anywhere, without previously disturbing the greatest state laws. The better the music in a state, the better the state will be is the famous Plato’s thought. It is undoubtedly true that both classical and traditional (folk) music, which constitute the main corpus of music lessons, promote humane and universal values. One of the greatest humanists among the composers, Ludwig van Beethoven, said that music is “a revelation greater than all wisdom and philosophy”. It refines and fortifies a man and develops love in him not only towards the beautiful, but also towards the community” (Domonji, 1986: 6). Moral education implies “the process of shaping the moral qualities of man, the views of the world, human society and man, of moral feelings, positive will and character, the skills and habits of moral behavior and acts in accordance with the embraced beliefs” (Kruļj et al., 2003: 109). Acquiring moral knowledge is the first stage in the formation of a moral personality. By singing appropriate traditional and classical songs, by listening and analyzing music, students are enabled to gain knowledge on moral values. Performing and listening to music activates an emotional component of moral consciousness, which includes “the tendency, the individual's ability to experience moral feelings (pride, honor, excellence, love, empathy, that is, the feeling of guilt, embarrassment, remorse, guilty conscience, etc.” (Jovanović, 2005: 58). Properly selected songs and compositions to listen to, coupled with an adequate conversation with students, will enable them to experience the most diverse feelings and, on this basis, develop the consciousness of moral knowledge, where music will increase their perception, which will contribute to the formation and consolidation of beliefs and moral convictions. Correctly selected songs and compositions to listen in music class, coupled with the link between this subject and other school subjects, can contribute to the education in the spirit of humanism, preparation for family life, for life in a community, education in the spirit of patriotism, internationalism, to the formation of a positive attitude towards work, and a positive attitude towards material and spiritual values (Branković, Ilić, 2004: 53). The beliefs adopted through music will be strongly embedded in students’ consciousness and their lasting memory, which is of great importance for the development of moral responsibility of students and moral behavior, which is the ultimate goal of moral education. Moral behavior is reflected in the relationship towards people: towards family, friends, elderly, towards work, homeland, in the observed behavior in public places and gatherings, as well as in other life situations. Music that greatly contributes to the moral education of students are traditional songs. Such traditional songs have clearly defined moral values. They help students notice what is good and what is bad; what is morally permissible, and what is unacceptable. They are guidance to a proper attitude towards people, towards one’s country; to the consistency of thoughts, words and deeds; to the positive attitude towards people, towards one’s country; to the consistency of thoughts, words and deeds; to the positive attitude towards work, material and spiritual goods. They emphasize mercy, justice, love for God, family and friends. They reveal the national character and help to get to know one’s own cultural identity, and to develop the sense of national identity. In traditional songs, the heroic image of the world is preserved, while betrayal and lies are despised. With their nature, these songs trigger in students the love of truth, justice, goodness, nobility and
humanity. Through them, students are educated on examples of struggle for ideals. In this way, they become a permanent ideal for them. The discussion about the structure and character of traditional songs encourages students to think about morally worthy actions, and moral behavior in everyday life.

**AESTHETIC EDUCATION IN PRIMARY SCHOOL MUSIC TEACHING**

In addition to the fact that music contents and activities contribute to the intellectual and moral development of students, their great importance is also reflected in aesthetic education. Aesthetic education is an important goal of the educational process and a significant factor in the development of a personality. Pedagogues point out that the comprehensive development of a personality cannot be achieved without aesthetic education as an essential component of the education process (Pedagogical Lexicon, 1996: 163). It follows from these attitudes that aesthetic education is equally related both to art and to non-art related areas.

Aesthetic education should contribute to developing the ability to perceive the beauty in art, as well as the ability to bring the beautiful into everyday life. This kind of education contributes to the formation and development of aesthetic taste, which is expressed not only in the perception and assessment of art, but also in the most diverse domains of human life. The main goals of aesthetic education refer to: the development of the ability to see the beautiful, of the ability to experience the good, of the ability to create beautiful, of the ability to value the beautiful. The ability to perceive beautiful relies on senses. Observation or perception is a “psychological function that allows the body to receive and process data about the environment and the changes it using the senses” (Hrnjica, 2005: 242). Perception is a complex experience, “where cognitive, emotional and motivational factors appear simultaneously” (Ibidem, 243). How one will react to a particular aesthetic phenomenon, i.e. whether he/she will be delighted with it or will stay indifferent depends on the ability to perceive the beautiful.

At a younger school age, the aesthetic taste of students is still not sufficiently developed, thus, “the totality of aesthetic standards has not yet accumulated, and the aesthetic experience is lacking” (Grandić, Joković, 2014: 150). That is why children at this age mostly superficially observe a work of art. Music performance, as well as listening to music, primarily triggers an emotional experience. To understand the work of art firstly means to experience it sensibly, to live it emotionally and only then to think about it” (Požgaj, 1950: 161). The ability to perceive beautiful relies on aesthetic perception. It is necessary for students to develop the ability to perceive and experience the beautiful from the young age. Based on the musical and psychological abilities of students, the teacher’s task is to properly select the songs and compositions for students to listen whose aesthetic values students will be able to observe experience and evaluate.

Children's artistic and traditional songs, as well as the program music are very suitable for the development of aesthetic sensitivity, because they are short, and the aesthetic values are clearly visible in them. Feelings caused by such music make the emotional life of students richer; they deepen and expand the sense for aesthetic values, affect the development of aesthetic criteria and attitudes, and encourage creativity. Music lessons teaching should provide significant support in developing the creativity and special traits of the students, while the teachers should constantly strive to discover new approaches to stimulating, developing and improving the creative music abilities of students. The goal is for students to be engaged in the pursuit of novelties, and to work on developing more productive rather than repetition skills. It is necessary to constantly strive to discover new ways to encourage, develop and improve the creative abilities of students. The classroom should be a knowledge workshop, a place for thinking and creation, “the place of the independent, critical and cooperative work” (Stevanović, 2000: 211). The teacher should be the instructor; he/she should plan and encourage the development of divergent thinking, which is the basis of scientific and artistic creation. Personality and attitudes of teachers "have a key influence on students’ achievements” (Bogunović, 2010: 225). If a teacher is indifferent towards creativity in teaching, this will surely lead to student's indifference and repulsiveness towards creative work. Positive and pleasant atmosphere in class is of great importance for the process of students' independent creativity. It is necessary to encourage students “to present and define their ideas; to highlight what is best in each student, and
to provide feedback to them on their "strong" points; to engage students in activities that will require initiative and independence" (Maksić, 2006: 150). The experience of success, as well as the praise by teachers, motivates students, "gives them more strength and the desire to be more involved and to make additional efforts in learning, problem solving and other activities" (Nikolić, Jovanović, 2005: 218). V. Tomerlin, a great advocate for the introduction of music creativity in the class, said that the benefits of creative work are that they contribute to joy, positive atmosphere, and activity, stimulate the interest in creativity, and develop fantasy and esthetic feelings (Tomerlin, 1969). Creativity in music lessons should not be considered as an isolated form of teaching. The creative activity of students "should follow and permeate all forms of teaching, to fit into them and to be their outcome” (Plavša et al., 1968: 163), which is the basis of the integrative link between the teaching subjects. Rojko (2012: 112), however, believes that "children's music creativity does not provide any guarantee that it will affect other subjects, i.e. that this kind of creativity will encourage students to a creative approach in other classes, or even form a general creative attitude towards everything that surrounds them". In his opinion, "what can be achieved by children's creativity is the development of that very creativity. There is no other goal to it because it does not have any other purpose beyond itself". Children's music creativity enables the teacher to identify and assess the music abilities of students, while the ultimate goal of creativity in teaching music culture is to develop musical abilities in the students. Stojanović (1996: 122) points out that the creativity of students should not be compared to the creativity of adults and emphasizes that it is the duty of teachers "to encourage the interest and happiness of creation" among students, especially at younger school age. Accordingly, the creative activities of students should be evaluated according to their creative engagement, and not by the quality of the work, because even the most modest musical improvisations are pedagogically justified. Jasmina Šefer also emphasizes that works of art with high artistic value are not expected in children's creativity, and that the emphasis should be on developing the research spirit in them. If a child's achievement exceeds the expected results for a certain age, this is interpreted as an increased intellectual ability of a child, but if a child creates something unique and extraordinary, then we can talk about creative potentials (Šefer, 2005; Ivanović (2007: 33) warns that “the performance and creation are the means by which the inner being of students is the most expressed”, and performance and creation processes can also make students repulsive towards the music-related activities, if the teaching process is not adequate, and in accordance with the musical and psychophysical abilities of students.

Creative music activities in music classes with younger children should be organized to resemble a game, which allows spontaneity and improvisation, which helps the creative potential to be developed in students. Aesthetic evaluation is an important task of music teaching, which is largely accomplished by listening to music. During analytical listening, students recognize the expressive musical forms and their aesthetic qualities. The method of aesthetic analysis enables more thorough and comprehensive perception of their aesthetic values. An analytical approach to listening to compositions implies the recognition of their originality and the specifics of musical elements - rhythm, melody, tempo, dynamics, agogic and harmony. Based on the analysis of these musical elements and incited feelings, students themselves should experience and evaluate aesthetic values. By listening to artistically valuable compositions, aesthetic knowledge and needs are expanded, aesthetic culture is enriched, while aesthetic expression and creativity are triggered. How much the students will be able to notice and experience the elements of aesthetics in music, to evaluate and appreciate them, largely depends on the correct choice of content and teaching material in music lessons. The appropriate choice of compositions for listening, suitable for students of younger school age, can serve as a basis for aesthetic education in music lessons.

WORK-RELATED EDUCATION IN PRIMARY SCHOOL MUSIC TEACHING

When it comes to work-related education, many pedagogues claim that at a younger school age should educational elements of this kind of education should be the prevalent ones, while at the older school age educational elements should be focused on. Educational tasks of work-related education refer to: the development of a positive attitude towards work in general and work obligations; the
In music classes, it is necessary that students develop love for art and to instruct them to respect valuable works of art, as the creations of people. Listening to music in class as a group contributes to the development of a sense of work and how to behave in a group. Group listening also encourages conscious discipline, because everyone is required to listen to the composition in silence. Being in a choir can also help adopt work-related education. This type of extracurricular activities provides the opportunity for each student to be engaged as a conscious, responsible and creative being. Being in a choir helps create work habits and develop the work culture and discipline of students. Singing in a choir particularly “develops the collective awareness of students and creates a sense in the individual that he or she is responsible for the success of the whole group” (Plavša et al., 1968: 197). This is of great importance for the development of the social awareness in students, their feelings of duty and obligation towards the society. Students understand the choir action as socially-oriented, artistic and cultural aspect of work: “Conscious and active engagement of individuals in social tasks contributes to their overall intellectual, moral and authentic advancement” (Jovanović, 2005: 63). By singing in the choir, students develop the love towards art and the desire to contribute to the development of cultural life of the environment which they live in. Students will apply the knowledge and experience gained in primary school choirs in other life situations. Choir singing will encourage the students to join amateur choirs in cultural and artistic groups even after finishing primary school. Growing up singing in a choir "students are given the opportunity to learn about the art of performing, through the joy that singing provides” (Jeremić, 2011: 104). For some students, the experience obtained in choirs will be a driver and inspiration for a more serious, perhaps even professional career in music in the future.

PHYSICAL EDUCATION IN PRIMARY SCHOOL MUSIC TEACHING

The link between music and physical development of young people was discussed even in the ancient times. It was believed that "music forms the soul and gymnastics strengthens the body, while together they significantly influence the overall development of the student” (Plato, 1939: 38-40). In the papers and books written, physical education is often associated with health education, so we often encounter the term physical and health education. This type of education aims to contribute to the versatile, harmonious, creative and authentic personality development. For this task to be accomplished there must be a connection between the intellectual, moral, aesthetic and work education, while music can also contribute to this significantly. This is especially obvious when it comes to physical education which deals with the development of coherence between the physical and spiritual development of personality and the unity of physical, voluntary, intellectual, and aesthetic personality elements. Music games contribute to the accomplishment of this task, which is why it is recommended to use them in order to link music teaching and physical education.

Music teaching methodology, especially the older editions (Požga), 1950, Rakijas 1967, Plavša et al., 1968, Manasteriotti, 1978), but also the newer ones (Đurković Pantelić, 1998, Lazarević, 2005), greatly encourage and emphasize the use of instrumental (piano) music in the background while
making any movements. When listening to classical compositions, “children enthusiastically turn into horses, cats, bunnies, bears, or lovely flakes, flowers and butterflies, and with instrumental music they make movements that match the characters from the game and its content” (Manasteriotti, 1978: 152). Making movement with instrumental music contributes not only to the physical development of the body, but also to the development of the overall physical and spiritual strengths and abilities of the students. They are of great importance for the development of students' musical abilities: for rhythm and melody, an ear for music, sense of rhythm and tempo, ability to listen and experience music actively. Dancing to the selected compositions stimulates the creative potential of students. Coordinated movements build aesthetic criteria and contribute to the development of motoric. Through instrumental music games, students adopt walking elements, familiarize themselves with different rhythms, master basic hand, body and legs movements, the children's jump and two-step, they master the movements to the right, to the left, backwards. These are important for aesthetic and proper posture. “They provide proper functions of the internal organs, bloodstream, heart and lungs. They also affect the central nervous system” (Đurić, Stijepović, 1976: 13). Dancing to the compositions such as minuet, waltz, gavotte, and others, contributes to the intercultural education and familiarity with the culture of European nations, while dancing to traditional folk music together with singing contributes to national education.

ECOLOGICAL EDUCATION IN PRIMARY SCHOOL MUSIC TEACHING

Ecological education is an integral part of general education that students acquire in primary school. The main goal of ecological education is that “students learn how to behave in nature, that is, how to take care of and improve their environment” (Kamenov, 2001: 123). Ecological education refers to the knowledge and skills that are primarily acquired at home and in school and which are related to the preservation of the environment. The goals of ecological education are socially varied, they relate to the acquisition of knowledge, skills and habits that are preferable for primary school students. Family plays a crucial role in ecological education, since its the foundation environmental awareness in children should first start at home, then, preschools and schools should continue educating children about the environment, making it an integral part of general education, and letting it permeate all school subjects. Teachers’ or ecopedagogues’ role is also very important. Andevski (2004: 116) states four roles of ecopedagogues who should develop ecological culture in school: “specialist, modeler, organizer, and advisor”. Moreover, it is necessary to use “diverse didactic material, to have classes in nature and to focus the lectures on students as participants in environmental conservation (Minić, 2017: 332).

In the last few decades, it has become increasingly common to hear warnings from experts pointing to the irresponsible behavior of people towards nature, which is leading to ecological catastrophe. Ecology should enable the creation of humane living conditions, and to raise students’ awareness of the importance of nature conservation. Many children's songs and instrumental compositions inspired by nature are suitable to be used to develop the feelings of love and responsibility towards nature and its resources. Such music should contribute to the systematic and comprehensive education of young people with the aim to preserve natural resources. A correlation between music lessons Nature and Society lessons could possibly help students experience and understand the phenomena related to nature, society and man.

CONCLUSION

The important tasks of primary education are the well-round development of students, developing their openness to new knowledge, skills and habits, as well as preparing students to properly function and find their way in life. Classical and traditional folk music which make up the basic teaching material in music lessons in primary school, promote universal and humane values as well as personal values - the individuality and relationships with other people. Adopted through music, these values remain permanently embedded in learners’ personality, contributing to their versatile, harmonious and permanent development. In order for students to have a developed awareness of their own role in the
society which they grow up in and where they need to be socially useful members, it is necessary to
develop their intellectual abilities and influence the creation of positive attitudes about moral and
aesthetic values, work, conservation of the environment, as well as the need for physical activity.
Such development is undoubtedly enabled by music contents and activities, making the music lessons
an important factor in the process of versatile education of primary school students.

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