The effectiveness of ‘values education’ program integrated with the 4th grade science and technology instructional program

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Abstract:

Delivering value education to the individuals and examining their value systems during behavior change is an indispensable part of education. This study assesses the effectiveness of “Values Education Program Integrated with the 4th Grade Science and Technology Course”—developed by the researchers—over students between 10 and 11 years of age. This study is based on the research model where pretest, posttest, and experimental and control groups are employed. Experimental and control groups which were determined randomly, contain 70 (35 students for each group) students studying at a public school in Ankara. Developed by the researchers, dilemma forms were utilized as an assessment tool in this study. After collecting pretest and posttest data, Mann Whitney U Test was employed to compare the mean scores of pretest and posttest answers given by the students in the experimental and the control groups while Wilcoxon Test was used in order to compare the groups in terms of repeated assessment. Moreover, “descriptive analysis” was conducted for the qualitative data of the study. According to the findings, comparison of the means regarding the values targeted in the program (being open-minded, unbiased, and scientific) also indicates a meaningful difference between the experimental and the control group. In addition, the qualitative data explains the difference between the experimental and the control group in terms of cognitive behavior and the difference between the pretest and posttest results of the experimental group.

Keywords: values education, educational program, science and technology.

1. Introduction

Schools should teach students alternative behaviors in order to make the right choices within the new circumstances of the present era, should be able to equip them with strategies that will help decide on new alternatives, and should support them in determining various goals. Education is naturally and inevitably directly related with a person’s goals and values. Values lead one’s preferences and behaviors. If education is broadly defined as the process leading to behavior change in an individual through experiences, then it wouldn’t be wrong to state that instructing individuals about value education and examining their value systems during behavior change is an indispensable part of education.

Social values are of crucial importance for an individual’s life. Values are consistent and deep believe which affect the person how to reach for something or prepare to do something. Values are valuable for society and people who behave appropriate for these values are valuable in the eyes of society (Dökmven, 2000; Kohlberg and Selman, 1972; Maslow; 1968).

Although one of the purposes of education is to “furnish students with affective behaviors”, literature review yields a limited number of studies on this. Educating people on only cognitive level is incomplete and not functional. Analysis of related literature reveals that various universal values considered as a significant part of
solution for the problems arising daily in social relations can be improved through suitably structured value education programs (Bacanlı, 2006; Çaya, 1997; Paykoç, 2007).

In the 21st centuries, informatics culture which comes out on top science and technology are lived all over the world. People should learn to follow the knowledge which is renewed continuously and to think scientifically to understand the modern world.

Alterations in the science and technology have increased the people’s prosperity; on the other hand they have brought also important impossible situation about the values in cultural dimension. These negative alterations have damage the social structure (Akbaş, 2004). Schools which are social association are affected from them. When improvement of the knowledge with the values is under consideration, the most important support for this improvement is education (Gardner, 2006). Increasing the quality of education depends on mostly curriculum in the both formal and informal education societies. To deem an educational program as successful, all the students should achieve the aims projected in the education curriculum (Demirel, 2006:177; Erden, 1998:3).

Although affective instruction is located in the curricula, it can be said that affective behaviors aren’t got to students and aren’t measured if they are gained or not by students. In the schools while cognitive behaviors are always tested, testing affective behaviors is neglected (Bacanlı, 2006; Bloom, 1995; Yaziçioglu, Semerci ve Semerci, 2000: 334). In the future, thinking to make education to focus solely on the science and technology is an easy but dangerous perspective.

Values give a direction to someone’s behaviors and preferences. According to Rokeach having done lots of researches about values education; value is a belief, preference or standard Rokeach (1968 Akt.: Güngör, 2000). Canatan (2004) also define the values as ideal targets. Values students get with values education affect firstly their families and circle of friends, then their acquaintances and at the end all the community. Science is a source of knowledge which should be completed with values as Gardner (2006) clarifies that.

Values should be get to students with education start from family and continue in the society. Protection values have disappeared rapidly in the last decades and bequeathing well life to children is the main duty of the parents and educators (Gökçek, 2007).

This study assesses the effectiveness of “Values Education Program Integrated with the 4th Grade Science and Technology Course”-developed by the researcher-over students between 10 and 11 years of age.

The 6-week Values Education Program Integrated with the 4th Grade Science and Technology Course was administered to 10/11-year-old children in order to endow them with the values which are designated in the program as to be open-minded, unbiased, and scientific.

According to the results of the previous studies, the Values Education Programs have been found to be effective in the development of these skills in the elementary education (Balci, 2008; Bulach, 2002; Demirhan, 2007; Dilmaç, 1998; Halstead, 1996; UNESCO, 2001).

The purpose of this study was to test the effectiveness of the Values Education Program Integrated with the 4th Grade Science and Technology Course.

2. Method

Both qualitative and quantitative research designs have been used in this study, which compares achievement levels of the students in terms of the values set in the program between the students who attended and did not attend the application of the value education program integrated with the 4th grade science and technology course. This study is based on the research model where pretest, posttest, and experimental and control groups are employed.

2.1. Participants

Experimental and control groups contain 70 (35 students for each) students studying at a state school in Ankara. Students in both groups were determined randomly.

2.2. Instruments

2.2.1. Values Education Program Integrated with the 4th Grade Science and Technology Course.
The independent variable in this study is the “Values Education Program Integrated with the 4th Grade Science and Technology Course” administered to the experimental group for 6 weeks. In setting values as aims of the value education program integrated with the 4th grade science and technology course, aims of the curriculum for the 4th and 5th grade Science and Technology Instructional Program -defined by the Ministry of National Education- and experts’ opinions were taken into account. These values are being open-minded, unbiased, and scientific. The purpose of the program is not only to endow students with some universal values, but also encourage them to think about the consequences that may emerge if they don’t comply with these values. Value analysis and Kohlberg moral dilemma approach served as the basis during program design. Accordingly, the program employs some moral stories with dilemmas related to science and technology units. And then it presents moral dilemma stories about scientists’ life and wants to discuss these situations. None of the values was imposed on the students during administering the program. Answers by the students were not fed back as right or wrong, nothing was said about what should or should not be done, and students were left alone in creating their own values.

2.2.2. Moral Dilemma Forms

Developed by the researchers, dilemma forms were utilized as an assessment tool in this study. Designed to elicit students’ responds to the situations in the stories and to determine the influence of values included in the program over the students, this form contains dilemmatic stories regarding each of three values. Necessary arrangements were made after the analysis of student answers obtained in a pilot study. Besides, interviews with students were conducted, and their responds were found to be consistent. Afterwards, the form was finalized by consulting experts’ opinions and it was determined that the test was appropriate for measuring their ideas and feelings about values.

2.3. Design

To determine the effectiveness of the Values Education Program Integrated with the 4th Grade Science and Technology Course, the Moral Dilemma Forms were administered to the children in the experimental and control groups before and after the training program. The pretest scores in both groups were compared using Mann Whitney U test for independent variables. The comparison indicated that there was no statistically significant difference between the mean pretest scores of both groups and that the groups were homogeneous.

2.4. Procedure

Before the Values Education Program Integrated with the 4th Grade Science and Technology Course took place and pretests were administered, the principals and class teachers of the schools where the research was being carried out were interviewed and convenient periods of time for the administration of the tests were determined. After the pretests were completed the experimental and control groups were determined. The principals, class teacher from the school that was chosen as the experimental group were informed about the training program through interviews and their permission was obtained. Then moral dilemma forms were carried out to students as a pretest. Then Values Education Program Integrated with the 4th Grade Science and Technology Course was delivered to the experimental group for two weeks; and after this 2–week period moral dilemma forms were administered to the students as a posttest.
After collecting pretest and posttest data, the means of questions asked to assess each value were calculated. Mann Whitney U Test was employed to compare the mean scores of pretest and posttest replies given by the students in the experimental and the control groups while Wilcoxon Test was used in order to compare the groups in terms of repeated assessment. Moreover, “descriptive analysis” was conducted for the qualitative data of the study. Each data was grouped and tabulated under the titles of behaving compatibly with the value, behaving incompatibly with the value, being indecisive, and others. Data obtained for the pretest and posttest was analyzed separately for each student.

3. Results

To determine the permanence of the Social Skills Training Program for Children, pretest mean scores for the children in experimental and control groups for values were matched with their posttest mean scores and compared by using Mann Whitney U Test. The findings are given in the Table 1.

<table>
<thead>
<tr>
<th>Tests</th>
<th>n</th>
<th>M</th>
<th>Sum of the Row</th>
<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>35</td>
<td>34,64</td>
<td>1272,50</td>
<td>-0,359</td>
<td>0,72</td>
</tr>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>35</td>
<td>36,36</td>
<td>1212,50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td>35</td>
<td>50,00</td>
<td>1750,00</td>
<td>-6,011</td>
<td>0,00</td>
</tr>
<tr>
<td>Control group</td>
<td>35</td>
<td>21,00</td>
<td>735,00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of the Mann Whitney U tests, indicated that for the mean pretest scores there were no significant difference found between the experimental group and control group after the Mann Whitney U test was carried out [U=0,359, p>.01]. The comparison indicated that there was no statistically significant difference between the mean pretest scores of both groups and that the groups were homogeneous. On the other hand, the mean posttest scores in the experimental group were significantly higher than those of the control group [U= -6,011, p<.01].

Findings have revealed that the program has led to significant improvements in terms of the values included in the program. The difference between the pretest and posttest means regarding the values aimed in the program (being open-minded, unbiased, and scientific) of the experimental group for the dilemma forms has been found to be statistically more significant than that of the control group. According to these results, it can be said that students in the experimental group were more successful than those in the control group about acquiring values.

In terms of the effectiveness of the training program, for the experimental group the pretest mean scores were matched with their posttest mean scores and then compared by using Wilcoxon Tests. The findings are given in the Table 2.

<table>
<thead>
<tr>
<th>Pre-test/Post test</th>
<th>n</th>
<th>M</th>
<th>Sum of the Row</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Row</td>
<td>34</td>
<td>18,06</td>
<td>614,00</td>
<td>-4,905</td>
<td>0,00</td>
</tr>
<tr>
<td>Positive Row</td>
<td>1</td>
<td>16,00</td>
<td>16,00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal Row</td>
<td>0</td>
<td></td>
<td></td>
<td>16,00</td>
<td></td>
</tr>
</tbody>
</table>

For the experimental group there was significant difference between the mean pretest scores and the mean posttest scores after the Wilcoxon Test was carried out [Z= -4,905 p<.01]. The comparison between the pretest and posttest results of the students in the experimental group also indicates a positive gain.

There are some examples for the student answers in the pretest and posttest from moral dilemma forms below;

About the value of being open-minded;

\( D_{\text{pretest}} \): I didn’t like her hair. But I don’t say her because she can be sad. I don’t want to upset her.

\( D_{\text{posttest}} \): If she ask me how her hair I can tell her the truth. Otherwise she doesn’t know the truth.

\( D_{1\text{pretest}} \): I didn’t like her hair. But I can’t say. If I say she will be put out with me.

\( D_{2\text{posttest}} \): I can tell her what I think because this is my idea.
D27pretest: I didn’t like her hair. But I won’t say. She can get angry and fight with me.
D27posttest: I say my opinion her politely. So she doesn’t get angry and not put out with me.

About the unbiased value;
D3pretest: I have lost my memory card. I have seen it in my friend’s bag. So he is a thief.
D3posttest: May be he has also the same memory card. I should ask him.

D11pretest: It’s my memory card. Give it to me! Otherwise I will say everyone that you’re a burglar.
D11posttest: We should ask him before accusing him. If I accused him immediately and I am wrong, all things would become bad.
D24pretest: It’s mine. I don’t believe that. He is my friend and he takes my belongings. I don’t greet him anymore.
D24posttest: He may find it or he may buy a new one. There are lots of similar cards.

About the scientific value;
D8pretest: My friend said to me if you see the black cat, you should hold your hair. Otherwise you will be unlucky. I didn’t believe him. When I saw the black cat, I didn’t hold my hair. After a few minutes I fall down. So I hold my hair whenever I see the black cat.
D8posttest: It can be a coincidence. Holding my hair is very scattering, not scientific.

D19pretest: This is true really! I hold my hair whenever I see the black cat.
D19posttest: To fell down when see the black cat isn’t logical. Why black cat? Why me? It can be only an accident.
D24pretest: I fall down because of the black cat. I will hold my hair from now on.
D24posttest: This is an untrue belief. May be I didn’t see a stone and then I fall down. It couldn’t be due to the black cat.

In addition, the qualitative data obtained from both the experimental and control groups supports the aforementioned quantitative data, and explains the difference between the experimental and the control groups in terms of cognitive behavior and the difference between the pretest and posttest results of the experimental group.

4. Discussion and Proposals

“Values Education Program Integrated with the 4th Grade Science and Technology Course” was implemented to the participants who were chosen from a determined group. At the end of the 6–week period of education, the results indicated that students in the experimental group improve their perspective on the values included in the, that are being open-minded, unbiased and scientific.

After values education, it was found that students in the experimental group interrogated values concept and developed positive behaviors for the relevant values. Children don’t born with fixed ideas and unbiased. They learn them from their families, equals, mass media and society (Miller and Sears, 1986; Taylor, Peplau and Sears, 2007).

Results obtained from the researches in the elementary education show that values education is effective on developing students’ values gains (Balci, 2008; Burke, Crum, Genzler, Shaub and Sheets, 2001; İ’scan, 2007).

Such kinds of education programs aiming to raise students as independent individuals who involve in decision-taking process of the democratic society without being under control of the others should be designed around these skills. These programs should be integrated not only with the social units like instruction of social sciences, history teaching, but also with the sciences units like science and technology and mathematics.

It is important that there should be an agreement between educators, school atmosphere, students’ families, also students and should be support the values programs for success of the program..

References

Çaya, S. (24-26 September 1997). Affective Dimension in History Education. Turkey, Republics of Turkish and Asia Pacific Countries Education Symposium, Elazığ.


