Comparison of traditional and constructivist teaching approaches in improving students’ academic achievement and self-concept (Grade eleven students of Bahir Dar preparatory school)

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Abstract

The purpose of this study was to compare traditional and constructivist teaching approaches in improving grade eleven students’ academic achievement and self-concept at Bahir Dar Preparatory School. Two out of 20 grade eleven sections were selected using simple random sampling. The first section was taught using traditional teaching approach while the second group was taught using constructivist teaching approach. Teacher-made test and self-concept inventory questionnaire (adapted from a Rasch Analysis of the Academic Self-Concept Questionnaire) were used. The two data collection instruments were employed before and after students were taught using the two different teaching approaches. The actual classroom teacher was assigned to teach for 9 weeks (40 Periods) after he had been given considerable training on both types of teaching approaches. Paired Samples and Independent Samples t-tests were employed for analyses. The results revealed that the academic achievements of both traditional and constructivist groups students have shown significant changes in the post-test results compared with their pre-test results. However, post-test results of the constructivist group were significantly higher than the results of the traditional; group. Similar results were obtained in the self-concept test, except in one of the components of self-concept (acquisition of knowledge) which both groups exhibit significant changes. From the results of this study, it is possible to conclude that the constructivist approach is a more effective method of teaching than the traditional teaching approach in improving students’ academic achievement and changing their self-concept.

Key words: Constructivist, Traditional and Teaching Approaches

Introduction

Background of the Study

Concerning the effectiveness, of teaching and learning, a lot of assumptions have been made over the past many years. Researchers have continuously conducted researches to identify an effective learning and teaching process. However, there are still inquiries that bring learning and teaching skills with appropriate methodologies into focus. The efforts made to examine advantages and efficiencies of different methods of teaching have brought conditions for newer ideas or innovations in the domain of teaching and learning. During earlier times, it presupposes that the role of the learner is primarily to assimilate whatever the teacher presents (Ainscough cited in Daniel, 2007; M.A. Thesis; Addis Ababa university).

Traditional method (Teacher centered approach) is a teaching method that occurs when teachers control instruction and procedures of teaching contents through presentation, giving directions to the class, and criticism associated with teacher-dominated activity (Taylor, 1998).

On the other hand, in constructivism, the learner is much more actively involved in a joint enterprise in constructing new meanings. The emphasis is on the learner as an active maker of meanings, and the
role of the teacher is to enter into a dialogue with the learner, and thereby help the learner to construct the meaning of the material to be learned. In the case of cognitive constructivism, the individual learner understands things in terms of developmental stages and learning styles. The philosophy of constructivism is associated with the writings of Dewey (1987) who emphasized the place of experience in education and the work of Piaget (1976), who demonstrated empirically that children’s minds are not empty rather they actively process the material with which they are presented and postulate the mechanisms of accommodation an, assimilation as key to this processing.

Since the theory of constructivism describes the process of meaning-making, in which individuals construct mental models that ground their understanding in a deeply personal and unique fashion, different schools in the world are using it in their instruction. Further, they employ it in the actual classroom believing that certain activities and environmental enrichments can enhance the meaning-making process. These activities include using active learning through kinesthetic, visual and auditory modalities, creating opportunities for dialogue, fostering creativity and providing a rich, safe and engaging learning environment (Brooks & Brooks, 1997).

Since constructivism is a learning theory describing the process of knowledge construction to create autonomous learner, the Ethiopian Education Policy strongly supports its practice in the classroom (TESO, 2003). Thus, the researchers have assessed how much it is effective for increasing the students’ academic performance and self-concept compared to the traditional method of teaching for its wide spread of implementation.

Statement of the problem

Knowledge construction is an active, process. The process of constructing one’s knowledge can involve cognitive (Shank and Shank, 1992) and physical constructions of meaning through the development of mental models or schemas (Johnson-Laird, 1980), as well as physical or virtual representations of knowledge (Duffy & Jonassen, 1992).

Consequently, many scholars suggest that the application of constructivist practices in the classroom presents benefits to both teachers and students (Brooks & Brooks, 1993 and Taylor, 1992). This approach makes students to actively engage in their learning experience, rather than acting as passive recipients of information (Cunningham, 1992). It helps them develop the process of collaborative learning and deep personal introspection into their learning process (Brooks & Brooks, 1993). Through dialogue, it helps learners form a network of understanding, a community of others with whom they can learn and share through discourse, mental manipulation, visualization, and the process of developing, testing and discarding hypotheses. This in turn helps learners develop academic self-concept.

Because of its enormous importance, nowadays many countries in the world give much emphasis for constructivist method of teaching and learning. Similarly, in Ethiopia, much effort has been made for the last few years to make the students become competent in their academic performance, meaning construction and creativity. Moreover, it is also believed that constructivist approach of teaching must be strengthened in teacher education institutions to train teachers who can tackle problems from the sense of responsibility as professional practitioner.

Accordingly, a nation-wide research was undertaken to survey the status and quality of training that has been given to primary and secondary school teachers (MoE, 2002). The study revealed that though teacher educators and teachers at different school levels had reasonably good academic knowledge, they lack skills in employing various teaching approaches (including assessment) that are set in the policy (MoE, 2002). The report also indicated that teaching institutions have been in problem to deliver good quality service at all levels as they followed set routines based on traditions, habit and traditional norms and expectations (TESO, 2003). In reaction to such diagnosis, TESO had designed different strategies: Higher Diploma Program (HDP) for higher institutions and continuous professional development (CPD) for primary and secondary school teachers aiming at improving teachers’ professional competence.

In doing so, secondary school teachers were given training on how to implement constructivist teaching approach to make them apply it in the classroom. Similarly, one of the researchers is an educational expert in the educational bureau of the Amhara Regional state. He has also been trained about the role of constructivist approach of teaching in the classroom. Despite such efforts made by
the government, the actual classroom observation by one of the researchers and other Regional Bureau education experts revealed that the traditional teaching is still valued by most general public schools. From the information obtained in panel discussions and observations by the experts in education bureau, parents are more concerned about test scores rather than improving students’ academic self-concepts. Some teachers and parents devalued the proposed constructivist teaching, arguing that educational circumstances in Ethiopia are not ready to implement it under the competitive college entrance examination system. Therefore, the researchers need to confirm the effectiveness of these two teaching approaches (constructivist and traditional) in terms of academic achievement and student self-concepts. For this reason, the researchers were instigated to explore the effectiveness of constructivist approach in improving students’ academic performance and self-concept compared with the traditional way of teaching.

As stated above, though an effort has been made to introduce constructivist approach to different responsible bodies and encouragement was made to teachers to employ it in their day to day practice, to the researchers’ knowledge, there was no empirical research that examined how much it is effective in promoting the students’ academic achievement and academic self-concept compared to the traditional way of teaching. Thus, this study sought to answer the following basic questions.

Research questions

1. Is there statistically significant difference in academic achievement between students taught in traditional and constructivist approaches?
2. Is there statistically significant difference in self-concept between students taught through traditional and constructivist approaches?

Objective

The general objective of this study is to identify the effects of constructivist approach of teaching on the students’ academic performance and self-concept compared to traditional way of teaching. Based on this general objective, this study aimed at;

1. identifying whether there is a difference in English language academic achievement between students in traditional classroom instruction and constructivist classroom instruction.
2. examining whether there is difference in students’ self-concept between students taught in constructivist and traditional approaches.

Significance of the study

The results of this study will have importance for different responsible bodies. First, it mainly helps teachers to have much awareness about which approach of teaching (constructivist/traditional) is helpful in promoting the students’ academic performance and their self-concept. Moreover, it will make them be aware of the procedures to be followed while applying different teaching methods. Lastly, it may help them give information about the effective application of constructivist teaching approach. Regarding school principals, it creates awareness about the differences of outcomes in applying different teaching methods and using the results in managing instructional supervision. Moreover, the results of this study can be useful for teacher training institutes to modify their training to equip trainees with various teaching approaches.

Delimitation of the study

Self-concept is a wider psychological variable that constitutes academic self-concept, self-esteem, success in career, etc. In this study, only academic self-concept (acquisition of knowledge, preparing for future lesson and tests) is considered. Students’ academic achievement is measured by teacher-made classroom tests.

Operational definitions of terms

Constructivist approach of teaching: is a method of teaching that makes students take responsibilities for their own learning. It is applied in the experimental group students.
Traditional approach of teaching is a way of teaching in which the teacher is the dominant practitioner of the teaching and learning process. It is applied in control group students.

Academic self concept is an individual student’s perception of self-efficacy with regard to acquisition of knowledge, preparing for future lesson and tests in his/her English language at Bahir Dar Preparatory School.

Design of the study

The Research design

This research is quasi-experimental. The researchers employed this design for the reason that it is difficult to select students randomly and assign them in different groups for a long period of instruction. As a result, students as they exist in their natural setting were taken for the study.

Target population of the study

The target population of the study was grade 11 students who were learning at Bahir Dar Preparatory School. Grade 11 was selected because the teacher in this school was the only volunteer teacher to participate in the study and teach both groups. Before the teacher started to teach, he was trained by the researchers about the nature of the two teaching approaches (traditional and constructivist). In this school, there were 20 grade 11 sections. From the total of 20 sections, only two sections (97 students) were selected. One section of students (50 in number) were grouped under experimental group and taught using constructivist teaching approach, the other group of students (control group 47 in number) were taught by traditional way of teaching. The control and experimental groups were selected using simple random sampling technique (lottery system).

Sampling technique

From the total of 20 sections, only two sections were selected by using simple random sampling techniques. All 97 students in the two sections were incorporated in this study (50 and 47 students in each class)

Data collection instrument

The instruments used to validate the effectiveness of constructivist approach were academic achievement test made by the classroom teacher and academic self-concept inventory questionnaire

Academic achievement test

This test was made by the teacher himself. After the test was constructed by the classroom teacher, it was given to two English teachers to check if there were any problems of unclear instructions, items, questions beyond the level of students and improvements were made based on their comments. It was also given to different English teachers who taught in that school and knew the academic level of the students. After some corrections were made, it was again piloted to grade 11 students who were not included in the study (Merawi Preparatory School) to check its reliability. To do this, test-retest method was employed within an interval of two weeks. Then, the reliability coefficient was calculated using Pearson product moment. The reliability coefficient (0.89) indicated that the test was reliable. After piloting and the reliability coefficient was calculated, it was administered two times (pre-test and post-test) for each group of students.

The questionnaire

The questionnaire which was adapted from different sources was one of the main data collection instruments. Before adapting the questionnaire from the sources, the most important points to include in the study were well-identified by the researchers, educational experts and fellow friends of the researchers. The items in the questionnaire were closed-ended which encompassed three parts. The first part included background details of the respondents’ sex and the group they were learning (constructivist or traditional). The second part consisted of students’ academic self-concept.
The items that showed the students’ academic self-concept were prepared based on Likert rating-scale ranged from ‘strongly agree’ to ‘strongly disagree’ (strongly agree, agree undecided, disagree and strongly disagree).

Pertaining to number of items, 35 items were used to investigate the students’ academic self-concept. From these 35 items, 20 items were adapted from a Rasch Analysis of the Academic Self-Concept Questionnaire while the rest 15 items were taken from the general self-concept inventory questionnaire (Chang Gung Journal of Humanities and social science, 2009).

The items in the questionnaire were administered in a jumbled order. However, during analysis, each item was reshuffled into its component parts for the benefit of keeping the concordances and consistency of the findings. Again to circumvent the artificiality of the respondents on their response.

Data collection procedures

The treatment period was 40 hours within 9 weeks in English classes. While the constructivist teaching approach was carried out based on undertaking innovating ideas, exploring, proposing, explaining, giving solutions and taking actions, the traditional teaching approach was conducted by undertaking introduction, development and review.

The data for this study were gathered two times—before treatment and after treatment. Before the teacher taught both groups by using constructivist and traditional ways of teaching, he was trained how to employ constructivist and traditional approach of teaching. Before the students were taught by the two approaches, the two groups of students (both the experimental and control group) were given a teacher-made test and academic self-concept inventory questionnaire. Then, the results were collected and analyzed quantitatively. After the treatments were given (after nine weeks), again teacher-made tests and self-concept inventory questionnaire were given to both groups and the data were gathered and interpreted.

Method of data analysis

To check the difference between the two approaches of teaching on students’ academic achievement and self-concept, pre-and post-test mean values were employed; whereas, to calculate whether there was a significant difference between the pre-test and post-test results of academic performance and self-concept of the two groups (constructivist and traditional teaching), one sample t-test was employed. To examine the statistically significant difference between the two groups of students’ pre and post-tests’ results, Independent sample t-test was employed. In doing so, SPSS16 was used.

Data presentation, analysis and interpretation

This part constitutes the analysis and interpretation of data collected through teacher-made tests and self-concept inventory questionnaire from students taught through traditional and constructivist teaching approaches.

The Academic Achievement of Students

Grade 11 students were tested to investigate how constructivist teaching approach was effective on their academic achievement and self-concept. Table one below shows students’ academic achievement results before and after intervention.

<table>
<thead>
<tr>
<th>Pre-intervention of Std</th>
<th>Post intervention of the Std</th>
<th>Mean</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
</table>

Table 1. Pre and Post-intervention Mean Differences of the Experimental Group
The above table indicates that in the pre-test, the experimental group scored an average of 23.96, whereas in the post-test this group of students scored an average mark of 29.56. The mean difference between the pre- and post-test is 5.60. Moreover, the Paired sample t-test indicates that there is a significant difference between the pre- and post-test results of the experimental group at p < 0.05 with df = 49, t = 6.991***. This implies that the constructivist approach of teaching has a significant role to improve the students’ academic performance.

Table 2. Pre-control and Post-control Mean on the Students’ Academic Performance

<table>
<thead>
<tr>
<th>Pre-test control mean</th>
<th>Std</th>
<th>Post-test control mean</th>
<th>Std</th>
<th>Mean difference</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.4894</td>
<td>4.7</td>
<td>24.7872</td>
<td>4.7</td>
<td>1.2978</td>
<td>46</td>
<td>0.032*</td>
</tr>
</tbody>
</table>

As shown in table 2, there is significant difference between the mean value of the post-test and with pre-test mean value of the control group. (p < 0.05 df = 46 t = 0.032). This implies that teaching in the traditional approach also has much effect in increasing the students’ academic performance.

Table 3. Mean Differences between Pre-and Post results of the Control and Experimental Groups on academic achievement

<table>
<thead>
<tr>
<th>Pre-and post tests mean difference of the experimental group</th>
<th>Pre-and post tests mean difference of the control group</th>
<th>Mean difference of the two groups</th>
<th>df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.60</td>
<td>1.2978</td>
<td>3.897</td>
<td>95</td>
<td>0.000</td>
</tr>
</tbody>
</table>

As table 3 indicates the pre-post mean differences of both experimental and control groups is 3.897. This indicates that there is an improvement of the students’ academic performance in the experimental group compared to the control group. The independent sample t-test result also shows that there is a statistically significant difference between the two groups (at p < 0.05 df = 95, t = 0.000)

Table 4. Paired sample t-tests on pre-test and post-test results of the control group students’ self-concept

<table>
<thead>
<tr>
<th>Pre-test control mean</th>
<th>Std</th>
<th>Post-test control mean</th>
<th>Std</th>
<th>Mean difference</th>
<th>Df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1.71</td>
<td>10.5</td>
<td>2</td>
<td>0.5</td>
<td>46</td>
<td>0.219</td>
</tr>
<tr>
<td>7.2</td>
<td>1.6</td>
<td>11.1</td>
<td>1.67</td>
<td>3.97</td>
<td>46</td>
<td>0.000</td>
</tr>
<tr>
<td>18.8</td>
<td>2.69</td>
<td>19.8</td>
<td>2.66</td>
<td>0.85</td>
<td>46</td>
<td>0.09</td>
</tr>
</tbody>
</table>

The results in Table 4 posit that significant self-concept changes were observed only on self-concept related to acquisition of knowledge. In the remaining two variables, the difference between the pre-test and post-test results was found to be non-significant.

Table 5. Paired sample t-tests on pre-test and post-test results of the experimental group students’ self-concept

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Std</th>
<th>Post-test</th>
<th>Std</th>
<th>Mean</th>
<th>Df</th>
<th>Sig</th>
</tr>
</thead>
</table>
Experimental mean | Experimental mean | difference | difference
11.1 | 2.16 | 17 | 0.99 | 6.5 | 49 | 0.000
6.2 | 1.7 | 12.5 | 1.06 | 4.34 | 49 | 0.000
16.4 | 2.16 | 29.78 | 1.48 | 13.34 | 49 | 0.000

Three paired sample t-tests were conducted to see whether or not significant mean differences of self-concept existed between the pre-test and post-test results of students taught by both traditional and constructivist approach. The analysis was made in three categories of self-concepts, namely, future goal of improving their lessons, acquisition of knowledge and preparing themselves for a test. The t-tests’ results have portrayed that except on acquisition of knowledge where both groups exhibited significant improvement of self-concept, in the remaining two categories of self-concept students who were taught using constructivists approach showed significant improvements. That is, students who were taught using constructivist approach obtained greater changes of self-concept in the post-test than those students taught by traditional approach.

Discussions

The study was carried out to investigate the effects of constructivist approach of teaching on students’ academic achievement and self-concept. The research was conducted by using different kinds of data gathering instruments. The results obtained from this study indicated that constructivist approach of teaching has a great role in enhancing the students’ academic performance and academic self-concept at Bahir Dar Preparatory School. The pre and post-test comparison of the two groups in academic achievements have shown that students in constructivist teaching approach performed better than that of the traditional teaching approach in the post-test. Moreover, the mean difference between pre-test and post-test results of the control and experimental groups have shown that the changes in the experimental group are significant compared to the control group.

In this study, attempts have also been made to see the impact of the two teaching approaches on the development of students’ self-concept. The results of three paired sample t-tests have portrayed that except in the second category of self-concept (acquisition of knowledge) the changes of self-concepts are significantly higher in constructivist teaching approach than in the traditional one.

Generally, the analysis made on the data obtained from different sources has posited that the effects of constructivist teaching approach are significant on students’ academic achievement and self-concept. The findings of this study correlate with that of the findings of Holt-Reynolds (2000) and Kroll & Larose, cited in Taylor (1998) which testified that constructivist approach has a significant role in affecting the academic achievement of students compared to the traditional teaching approach.

This result is also in line with the already established facts that self-concept and academic achievement are interrelated. In view of this, Kane(2003) stated that the relationship between self-concept and academic achievement has been discussed extensively in the psychological literature. On the one hand, one could argue that doing well in school is likely to enhance the students’ positive self-concept. On the other hand, it can also be argued that students who develop positive self-concept feel better about themselves and their ability, and as a result, they do better academically. It is difficult to resolve this issue because there is evidence to support both positions. It is also difficult to determine which comes first, high achievement or high self-concept. It is likely that a positive change in one facilitates a positive change in the other.

Students’ self-concept can be an important aspect in understanding how you and people deal with academic tasks. Many students are caught in a vicious circle. They believe they cannot perform well in a certain activity and they avoid it. They fail to get practice in the activity and do not perform well when they are asked to respond in class. The negative experiences caused by the inability to respond correctly only reinforce their initial belief about their inability. This dynamic process is called the self-fulfilling prophecy. As to Brophy (1983), adults as well as children are victims of the beliefs they hold about themselves. The main point is that a negative self-image can be self-perpetuation and over time it can have negative effect on academic achievement (TESO, 2003).

In view of this, Cunningham (1992) stated that constructivist approach students are made to actively engage in their learning experience, rather than acting as passive recipients of information. And, Brooks & Brooks (1993) posited that this approach helps to develop the process of collaborative
learning and deep personal introspection into one’s own learning process through dialogue, mental manipulation, visualization, and the process of developing testing and discarding hypotheses. This in turn helps to develop learners’ academic self-concept.

This implies that constructivist approach of teaching appears to be an effective approach to enhance students’ self-concept and thereby their achievement and vice versa. This method/approach sustains students’ motivation by reinforcing the interactive effect of both variables (self-concept and academic achievement). This is because students’ results in academic achievement and different categories of self-concept measures in constructivist approach exceeded those of students in traditional approach. In the constructivist approach, students were given opportunity to reflect, evaluate and thereby construct their own knowledge as it best fits into their previous experiences. This, in turn, helps them develop their self-concept about what they have learned. The interaction that takes place among students also helps them understand the concepts easily and perform in the academic achievement. The role of the teacher as facilitator than authoritative source of knowledge might have contributed for the enhancement of students’ self-concept. This is because absence of fear of criticisms from the side of the teacher and teachers’ encouragement of students to participate in discussions and learn as per their learning styles (Dewey, 1987) might have played significant roles in enhancing students’ self-concept.

Conclusion

Thus, from the results of this study, it is possible to conclude that constructivist approach is a more effective method of teaching to improve students’ academic achievement and self-concept than the traditional teaching approach.

Recommendations

1. Teacher training institutes should focus on equipping trainees with varied teaching approaches with higher emphasis to constructivist teaching approach.
2. On job (Short term) training should be given to teachers about how to employ constructivist approach in their specific subject areas based on research findings.
3. Teachers’ continuous professional development should incorporate discussions on how to apply constructivist approach in each subject.
4. Further research is recommended on how to apply constructivist teaching approach in different subjects

References


Addis Ababa Constructivism as it Relates to Pre-service and In-service Teachers. Addis Ababa