

An Analysis of the Relationship between in-service Teachers' Efficacy Levels, their Attitudes towards Constructivist Approach and Towards their Profession, and their Teaching Techniques

Ayşem Seda Önen, Canan Koçak Altundağ, F. Merve Mustafaoğlu
Chemistry Education, Hacettepe University, Turkey

ABSTRACT: *This study aims to investigate the relationship between the attitudes of Physics, Chemistry and Biology teachers towards the constructivist approach to teaching and towards their profession, and their efficacy levels. 1958 high school teachers within the Ministry of National Education from several cities in Turkey participated in the study. Data were gathered through Ohio Teacher Efficacy Scale (Tschannen-Moran & Woolfolk-Hoy, 2001; Baloglu&Karadag, 2008), Constructivist Approach Attitude Scale (Balim, Kesercioglu, Inel&Evrekli, 2002) and Attitudes Towards Teaching Profession Scale (Cetin, 2006) in order to find out whether there was a statistically significant relationship between teachers' attitudes and their efficacy levels. Results showed that there existed a positive statistically significant correlation between the attitudes and the efficacy levels. Namely, as the participants' efficacy levels increased, their attitudes towards teaching profession and towards the constructivist approach to teaching increased, as well.*

Keywords –Attitude, constructivist approach, efficacy, teaching profession.

I. INTRODUCTION

A new paradigm, being shaped at the beginning of the last century and having become widespread since then, claims that knowledge is not discovered, but interpreted; that knowledge does not emerge but it is created; in other words, constructed by two parties (Ozden, 2005). Named as constructivism, this notion is now represented not only as a learning theory but also as a theory of teaching, thinking, personal knowledge and curriculum development (Gordon, 2008; Matthews, 2002). According to the constructivist approach, learning is an inner process taking place in the learners' mind. Therefore, learners are not the passive receivers of the external stimulus, rather they internalize these stimulus and take active role in creating behaviors. After all, while storing, knowledge is not transferred directly to the human brain. Besides, the brain is not an empty storage where all knowledge is stored. The constructivist approach is based on the idea that any kind of learning is the result of a constructing process in the brain. This idea assumes that individuals construct new knowledge by associating them with the knowledge already existing in their mind. During this constructing procedure, learners try to create a meaningful representation of the knowledge in their brain and associate this with themselves. Namely, learners establish knowledge as they construct it not as they have been presented (Glaserfeld, 1995; Arslan, 2007). Therefore, the most important issue in the constructivist approach is the fact that it gives chances to the learners to construct, create, interpret and build up the knowledge. Accordingly, it is intended to constructing knowledge and seeks to explain how the learners locate the newly learnt knowledge in their mind (Ozturk, 2008). Although, constructivist learning, carrying utmost importance in teaching, puts the learner at the center, the role of the teacher as a guide is also essential in constructivist approach. Teachers are to provide learners with rich amount of resources utilizable for constructing knowledge, as well as learning environments suitable for individual or group learning (Deryakulu, 2001). According to Gunes (2007), a teacher adopting such an approach tries to explore learners' previously learnt knowledge, skills and thoughts before presenting new knowledge. Thus, s/he activates learners' prior knowledge. S/he finds out what learners think about an issue in question before presenting his or her own ideas, and offers unsolved problems or real life situations and encourages them to make analyses and evaluations on them. Thus, learning focuses on solving real world problems. A teacher adopting the constructivist approach provides the learners with a variety of materials for the course. S/he makes use of such techniques, methods and strategies as problem solving, project based learning and cooperative learning in order to improve students' social skills. S/he establishes an atmosphere for the pupils to express their ideas freely and motivates them to communicate and interact with each other. S/he tries her/his best to create a democratic relationship with the learners (Marlowe &Page, 1998, s.33; Biyikli, Veznedaroglu, Oztepe & Onur, 2008; Selley, 1999; Brooks & Brooks, 1999). So, making learners to construct, interpret and improve knowledge requires more qualified and efficient teachers. And efficacy is about an individual's being able to overcome the difficulties while trying to achieve a goal (Bandura, 1977).

Considering the learners of our age, teachers should not have a passive role in learning, rather they are to have a full command of learning process in a great many respects. Besides, curricula which necessitate learning environments based on the constructivist approach bring about more duties and responsibilities for teachers. To fulfill these duties and responsibilities, especially the affective features of teachers are believed to have an essential contribution to in-class learning (Balım, Kesercioğlu, İnel & Evrekli, 2002). Especially their attitudes towards the teaching profession reflect one of the strongest predictors of their behaviors as the actors of their profession, that is, their “professional identity” (Can, 1987; as cited in Çetin, 2006). In this respect, teachers' attitudes towards the constructivist approach and their efficacy levels gain more and more importance in identifying their attitudes towards the teaching profession. Henceforth, the present study aims to provide insights onto teachers' attitudes towards the constructivist approach and the teaching profession, their efficacy levels, as well as the teaching techniques and methods used by them.

II. AIM OF STUDY

The current study aims to explore Physics, Chemistry and Biology teachers' attitudes towards the constructivist approach and towards the teaching profession, and their efficacy levels. The teaching techniques and methods used by these teachers during their classes are also sought within the scope of this study.

III. METHODOLOGY

1958 high school teachers working within the Ministry of National Education participated in the study. For the study, Ohio Teacher Efficacy Scale (Tschannen-Moran & Woolfolk-Hoy, 2001; Baloğlu & Karadağ, 2008, $\alpha=0.80$), Constructivist Approach Attitude Scale (Balım, Kesercioğlu, İnel & Evrekli, 2002, $\alpha= 0.93$) and Attitudes towards Teaching Profession Scale (Çetin, 2006, $\alpha= 0.95$) were utilized. Furthermore, in order to determine teaching techniques and methods used by the teachers a chart, in which a grading scale was put, was prepared. Thanks to this chart, how often teachers had or had not used these techniques and methods was investigated. Alpha value for this scale, named as Teaching Techniques and Methods, was 0.91, while the Guttman value was calculated as 0.91. For the analysis and interpretation of the data, Pearson product-moment correlation coefficient was run to measure the relation between the scales, for which the significance level was $p=0.01$.

IV. RESULTS

In this part of the paper, results of the study were mentioned under several headings.

4.1. The relationship between teachers' efficacy levels and their attitudes towards the constructivist approach and towards the teaching profession

In order to find out whether there is a relationship between teachers' efficacy levels and their attitudes towards the constructivist approach and towards the teaching profession, Pearson Correlation Coefficient was employed. Results for this test were presented in Table 1:

Table-1: Pearson Coefficient of Correlation for the Relationship between Teachers' Efficacy Levels and their Attitudes towards the Constructivist Approach and towards the Teaching Profession

Ohio Teacher Efficacy Scale	Attitudes towards Teaching Profession	Attitudes towards the Constructivist Approach
Guidance	.359**	.381**
Management of Behavior	.327**	.303**
Motivation	.360**	.363**
Teaching Skills	.352**	.395**
Assessment and Evaluation	.290**	.304**
General	.383**	.396**

** $p<.01$

As seen in Table 1, there are positive and significant relationships between the participant teachers' efficacy levels and their attitudes towards the constructivist approach and towards the teaching profession. Hence, teachers having higher efficacy levels can be said to show more positive attitudes towards their profession and constructivism.

4.2. The relationship between teachers' attitudes towards the constructivist approach and their efficacy levels and their attitudes towards the teaching profession

Whether there is a relationship between teachers' attitudes towards the constructivist approach and their efficacy levels and their attitudes towards the teaching profession was also inquired and the results were as in Table 2:

Table-2: Pearson Coefficient of Correlation for the Relationship between Teachers' Attitudes towards the Constructivist Approach and their Efficacy Levels and their Attitudes towards the Teaching Profession

Attitudes towards the Constructivist Approach	Ohio Teacher Efficacy Scale	Attitudes towards the Teaching Profession
Positive Attitude	.404**	.427**
Negative Attitude	-.069**	-.169**
Attitudes towards Self-improvement	.304**	.378**
General Attitude	.396**	.418**

**p<.01

Considering the data in Table 2, it is seen that there are statistically significant positive and negative relationships between teachers' efficacy levels and their attitudes towards teaching profession and towards the constructivist approach (p<.01). Teachers who had positive attitudes towards the constructivist approach and self-improvement were found out to have higher levels efficacy and more positive attitudes towards their profession. Moreover, participants, whose attitudes towards the constructivist approach were negative, were proven to possess lower levels of efficacy and more negative attitudes towards teaching profession.

4.3. The relationship between Teachers' attitudes towards their profession and their efficacy levels and their attitudes towards the constructivist approach

The possible relationship between teachers' attitudes towards the teaching profession and their efficacy levels and their attitudes towards the constructivist approach were analyzed through Pearson Correlation Coefficient, the result of which was shown in Table 3:

Table-3: Pearson Coefficient of Correlation for the Relationship between Teachers' Attitudes towards the Teaching Profession and their Efficacy Levels and their Attitudes towards the Constructivist Approach

Attitudes towards the Teaching Profession	Ohio Teacher Efficacy Scale	Attitudes towards the Constructivist Approach
Affection	.362**	.400**
Value	.289**	.326**
Harmony	.266**	.254**
General Attitude	.383**	.418**

**p<.01

Based upon the data in Table 3, it can be stated that there are positive relationships between teachers' attitudes towards the teaching profession and their efficacy levels and their attitudes towards the constructivist approach. In other words, teachers with more positive attitudes towards their profession were noted to have higher levels of efficacy and more positive attitudes towards the constructivist approach.

Table-4: Frequency and Percentage Values of the Teaching Techniques and Methods used by the Teachers

		f(%)				
		Always	Usually	About Half the Time	Seldom	Never
1	Question-answer technique	35.5	55.5	8.3	.5	.2
2	Context based learning	22.4	49.3	25.7	2.2	.3
3	Problem solving method	16.2	56.6	25.9	1.0	.3
4	Brain storm	15.4	43.4	32.4	7.9	.9
5	Worksheets	14.0	42.1	35.5	7.0	1.2
6	Inquiry based learning	10.7	38.0	45.0	6.1	.3
7	Computer based learning	16.3	31.6	37.0	10.8	4.3
8	Argumentation method	9.8	38.4	40.8	9.3	1.8
9	Concept maps	9.8	34.7	43.2	10.2	2.1
10	Cooperative learning	8.5	35.2	44.9	10.1	1.4
11	Case method	6.4	30.7	45.6	14.8	2.6
12	Demonstration method	6.2	28.2	43.2	17.1	5.4
13	Simulation method	5.6	28.5	42.2	16.1	7.6
14	Internet based learning	9.0	21.1	41.4	18.4	10.1
15	Laboratory based learning	6.6	19.4	46.5	19.5	8.0
16	Discovery learning	4.4	19.8	47.2	22.1	6.5
17	Argumentation based learning	4.3	18.4	50.8	17.4	9.1

18	Project based learning	3.4	13.9	48.6	27.4	6.6
19	Educational games	3.3	13.5	45.9	30.9	6.3
20	Drama technique	3.3	10.4	39.4	29.6	17.4
21	Six thinking hats technique	1.7	8.1	36.1	25.5	28.5
22	Panel, debate, forum	1.4	5.4	29.7	41.7	21.9
23	Educational tour	1.3	3.5	29.3	39.8	26.1

With reference to Table 4, it can be claimed that teachers are mostly utilizing problem solving, real life-based teaching and question-answer technique.

V. DISCUSSION AND CONCLUSION

The basic idea behind this study is the belief that learning about the relationship between teachers' attitudes towards the constructivist approach, which necessitates hard work and much devotion, and towards their profession and their levels of efficacy, as well as the teaching techniques and methods they use, would contribute to the efforts for the improvements in teaching profession, to teachers' success and being satisfied with their success. Accordingly, as teachers' efficacy levels increase, their positive attitudes towards constructivism and towards their profession increase, too. Since competency in any subject is related to efficacy, teachers who feel themselves efficient would also feel competent. When trying to predict whether there is a relationship between teachers' sense of efficacy and their attitudes towards the constructivist approach to teaching, higher levels of efficacy were observed in teachers with more positive attitudes. Similarly, teachers having positive attitudes towards constructivism and towards self-improvement were found to have adequate levels of efficacy and positive attitudes towards their profession, whereas teachers with negative attitudes towards constructivism showed lower levels of efficacy and negative attitudes towards their profession. In a similar vein, teachers having positive attitudes towards their profession had sufficient levels of efficacy and positive attitudes towards the constructivist approach. All in all, high school science teachers are to teach their classes in a constructivist manner as much as possible. As a matter of fact, despite the criticisms in recent years, the constructivist approach to teaching is quite favorable due to its contribution to the learners' gain by increasing their performance and therefore enhancing their potential as good learners.

Teachers, with no doubt, constitute the most important part of an educational system because teachers are known to be more effective on students and curriculum than any other component of education. Teachers, carrying such a vital responsibility, are to make use of teaching techniques and methods in a professional manner. Therefore, the techniques and methods they apply in their classes should be evaluated within the scope of teaching profession. Teachers participated in this study were observed to use problem solving, real life based teaching and question-answer technique at most. However, they never utilize such methods as the six thinking hats, panel, debate, open discussion, forum and field trip. All in all, it is widely known that learning environments in which students participate actively are quite essential for an efficient learning and efficient teaching, as well, by promoting teachers' efficacy (Fink, 1999).

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