

Prospective Teachers' Activity Designing Skills in Accordance with Cognitive Constructivism Strategies

Öğretmen Adaylarının Bilişsel -Yapılandırıcı Stratejilere Göre Etkinlik Hazırlama Becerileri

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Abstract. The aim of this study is to support and examine the level of teaching process designing skills of prospective teachers of Turkish based on two main educational approaches. The research process has been designed in accordance with the stages of the mixed research model. In the first stage of the research, prospective teachers were given training on Revised Bloom Taxonomy (RBT) and 5E model. In the first stage of the study, prospective teachers were provided training on cognitive constructivism strategies. Then; knowledge was given about the teaching strategies developed according to these approaches. In the second stage, prospective teachers designed activities based on these strategies. In the third stage, the designed activities were assessed through a pre-developed rubric. Based on the achievement levels of the activities designed in this stage, the function of RBT and 5E Model and the cognitive and constructivist approaches were compared and evaluated. In the last stage of the study, prospective teachers' feelings and thoughts about RBT and 5E model were examined qualitatively. In this context, semi-structured interview was conducted and the data were collected and analyzed. The findings obtained from the examinations on quantitative and qualitative data were evaluated. According to these findings, it was determined that the activities prepared by prospective teachers according to RBT were generally more successful and sufficient than the activities prepared according to 5E model. According to the results, it was suggested that prospective teachers could design activities by benefiting from *cognitive constructive* strategies.

Keywords: Activity designing, cognitive constructivism, strategies

Öz. Bu araştırmanın amacı, Türkçe dersi öğretmen adaylarının iki önemli eğitim yaklaşımına göre öğretim süreci tasarlama becerilerini desteklemek ve incelemektir. Araştırma süreci, karma araştırma yönteminin aşamalarına uygun olarak tasarlanmıştır. Araştırmanın ilk aşamasında öğretmen adaylarına Yenilenmiş Bloom Taksonomisi (YBT) ve 5E modeliyle ilgili eğitim verilmiştir. Daha sonra bu yaklaşımlara göre geliştirilen öğretim stratejileri hakkında bilgi verilmiştir. İkinci aşamada öğretmen adayları, bu stratejilerden yararlanarak etkinlik tasarlamışlardır. Üçüncü aşamada ise hazırlanan etkinlikler, önceden hazırlanan dereceli puanlama anahtarları ile incelenmiştir. Bu aşamada hazırlanan etkinliklerin başarı düzeylerine göre YBT ve 5E modelinin işlevi ve bunlardan hareketle bilişsel ve yapılandırıcı yaklaşımlar karşılaştırılarak değerlendirilmiştir. Çalışmanın son aşamasında öğretmen adaylarının YBT ve 5E modeliyle ilgili duygu ve düşünceleri nitel olarak incelenmiştir. Bu kapsamda yarı yapılandırılmış görüşme gerçekleştirilerek veriler toplanmış ve incelenmiştir. Nicel ve nitel veriler üzerinde yapılan incelemeler sonucunda ulaşılan bulgular değerlendirilmiştir. Bu bulgulara göre öğretmen adaylarının YBT'ye göre hazırladıkları etkinliklerin 5E modeline göre hazırladıkları etkinliklerden genel olarak daha başarılı ve yeterli olduğu belirlenmiştir. Ulaşılan sonuçlara göre öğretmen adaylarının *bilişsel yapılandırıcı* stratejilerden yararlanarak etkinlik tasarlayabilecekleri önerilmiştir.

Anahtar Kelimeler: Etkinlik tasarlama, bilişsel yapılandırıcı, stratejiler

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Introduction

The effort to reach the target level in education has led the researchers to explain the relationship between the studies on learning and education practices. In order to establish a strong connection between these two aspects Dewey drew attention to *the connection science*. In this scope, Tyler (1978) and Lynch (1945) tried to explain the relationship between studies on learning and education practices; Tyler calling that relation an intermediary position and Lynch explaining this relation an engineering simulation (cited in Ertmer and Newby, 2013, p.43). This relation is a crucial factor in studies on designing a teaching process since the designers of the teaching process emphasized the necessity of two sets of knowledge and skills in order to unite the principles of education-teaching principles with teaching materials and activities (specifications). The first of those is about the designer's understanding of the position of the implementer in the teaching process. What are the situational and contextual restrictions of the implementation? Based on this question, the designer is supposed to monitor the implementer more closely and understand their situation better. The second core of that knowledge and skills is the issue of necessity for a *bridge or connection*. Here the understanding of research and potential solution sources (i.e. human learning theories) is emphasized (Ertmer and Newby, 2013, p.43-p.44). Evaluation of science-based on this process has formed the base for the behavioral research method. Behaviorists focused on behaviors and mental processes and checked for the possibility to observe these two facts. According to behaviorists, mental processes cannot be observed. On the other hand, human behaviors or behaviors of animals can be observed. Hence, behaviorists emphasized that scientists must focus on phenomena that can be observed rather than those that cannot be observed. Accordingly, behaviorists defined the concept of *behavior* in the frame of observing the outcomes of behaviors (Tomic, 1993, p. 39).

The effect of behaviorist theory on the cognitive structure during language acquisition attracted researchers' attention. The data and conceptual aspects of revised scientific studies on language acquisition are in good harmony with behavior analysis. In spite of this harmony, details such as to what extent the cognitive structures related to both theories, to what extent rich language change processes are congenital and to what extent functional analyses can explain the importance of vocabulary and syntax learning might give rise to conflicts between two theories (Dale, 2004, p.348). At this point, Chomsky focuses on the relation between behavior and cognition in language acquisition. According to Chomskyan perspective, the language structure is seen instantaneously in an abstract and acquired form (Chomsky, 1965). According to the cognitive approach, teaching practice must be real and authentic since a rich classroom environment that promotes students' ability and desire to discover is targeted. In this way, students will be encouraged to discover the teaching materials and be active during the configuration of knowledge. These are the characteristics of a successful education. In the cognitive approach, a successful teaching process gives teacher an opportunity to focus on how to represent these cognitive processes (Fenstermacher and Richardson, 2005). The efficiency of cognitive theory in the learning-teaching process has been studied in different aspects. Some studies concluded that an education process that had been designed in accordance with cognitive strategies was realized in line with its purpose and in a successful way (Azumi, 2008; Olson and Land, 2007; Meang, 2006; Griffiths, 2004; Holden, 2004; Martinez, 1996).

Although constructivism started to gain an important spot for education researchers, the interaction between cognitive theory and the constructive theory started a new dispute during this process. Constructivist conflicts within the cognitive scheme were criticized for their

different aspects. These conflicts emerged around the concept of *cognitive constructivism* (Derry, 1996). During the mid-20th century, constructivism that was reflected in education-teaching activities was studied and evaluated in many respects. Especially, Piaget worked on explaining this theory. Constructivism, being evaluated in a detailed way in education, has been defined in various fields. Therefore, the meaning of constructivism varies depending on the perspective and position of the individual doing the evaluation. While Piaget defined constructivism in both philosophical sense and as personal constructivism, Vygotsky stressed the social constructivism (Cited in Amineh and Asl, 2015). Glasersfeld (1995), on the other hand, emphasizes radical constructivism and dwells on the concepts of constructivist epistemologies and educational constructivism. Constructivism in its postmodernism or deconstructive version has very crucial impacts on literature, art, history, social science and theological education (Matthews, 1997). Due to this wide scope of the definition, apart from being a theory of teaching, constructivism has also been defined as a theory of knowledge and learning. Brooks and Brooks (1993) define knowledge with the concepts of temporary, developmental, socially and culturally mediated, and thus, non-objective based on this theory. Glasersfeld (1995, p.3) explains the function of this approach as “A constructivist approach to conceptual development can help to engender a rapport between teacher and student and a propitious mood among the students, the creation of discipline is essentially a task with which teachers have far more experience than any theoretician”. Prioritizing the learners’ learning experiences, constructivism dwells on two outcomes: In the first one, rather than focusing on the subject and course during the education process, teachers must focus on the individual who thinks according to his/her own way of the learning process. In the second one, the interpretation process is restricted to the meanings that the learning individual assigned to the knowledge within the experience s/he acquired (Hein, 1991, Cited in Arslan, 2007, p. 46). Twomey Fosnot (1989) summarizes the principles of constructivism as learning depends on what individuals have already know; when individuals adopt and change new knowledge, new ideas occur; the learning process involves the invention of ideas rather than mechanically accumulating a number of facts; meaningful learning takes place on the condition that rethinks old ideas and draws new conclusions about new ideas that contradict our old ideas.

Results of some studies conducted in this regard suggest that constructivism is effective in the teaching process in terms of its five characteristics. These characteristics are; reforming the teaching views, emphasize on cooperation and communication and train students’ cooperative consciousness, start to teaching with students’ previous knowledge/experiences/thinking mode, learning habits and methods, teaching that changed from authoritative conducting to equal association and communication and finally creating a better teaching environment (Jia, 2010, p.198-p.199). On the other hand, Fox (2001) emphasizes the characteristics that are distinctive to constructivism theory, and state them as follows: active process, constructed knowledge, invented knowledge (all knowledge is personal and all knowledge is social), essential learning for a process of making sense of the World effective learning. The impacts of constructivism on the learning-teaching process have been evaluated through some experimental studies. In a study with experiment and control groups, a teaching process in which constructivist education was implemented, an increase in the participants’ positive attitudes towards the learning environment was observed. It was found that the authentic evaluation results of the constructivist approach were high and there were significant relations between those results (Bay and Karakaya, 2009). In another study, prospective teachers’ observations about assessment and evaluation activities designed based on a constructivist approach were examined. The results of the data gathered in accordance with the qualitative model revealed that prospective teachers found an assessment

and evaluation process that was designed based on the constructivist approach funny, relaxing, suitable for individual differences and appropriate for supporting permanent learning (Akkuş, 2014). For another study, problems that prospective teachers experienced during activity designing and implementing the process in accordance with the 5E Model were studied. The findings of the study revealed that participants had difficulty in managing time effectively, applying the 5E steps sufficiently, ensuring discipline, relating the topics to daily life, etc. (Metin and Özmen, 2009). In a similar study, primary school teachers implementing the teaching process in accordance with the constructivist approach was observed. Findings from these observations showed that teachers could not fully realize the teaching activities designed in accordance with the 5E Model (Gökçe, Demirhan İçsan, and Erdem, 2012). Although these studies include both positive and negative effects of the constructivist approach some studies reveal results supporting the efficiency of the constructivist approach, there is still a need for a large number of sound experimental and theoretical studies to fully demonstrate efficiency of the constructivist approach in the education process (Panasuk and Lewis, 2012).

Bloom, Engelhart, Furst, Hill, and Krathwohl (1956, p. 204) describe the cognitive concept, which is referred to as cognitive processes, as intellectual competence and skill, which generalize techniques and techniques related to materials or problems. And this domain is related to metacognitive knowledge. Because metacognitive knowledge includes knowledge about students' own cognitive competencies. Metacognitive domain has two functions as metacognitive knowledge and metacognitive regulation. Student's knowledge about other strategies when using a particular strategy can be given as an example (Flavell, 1979). Flavell describes the concept of metacognition as *cognition about cognitive phenomena or thinking about thinking* (Flavell, 1979). Krathwohl, Bloom, and Masia (1964) determined the behaviors of affective domain based on the concept of *internalization*. Therefore, the source of affective behavior is derived from the internalized source rather than external stimuli. Depending on the innovations in education and the purpose of teaching, different approaches may be taken as a basis in the process of designing the teaching process. Therefore in this research, it is aimed to design a teaching process in accordance with the domain of cognitive and constructive development.

Method

Research Design

The present study has been conducted in accordance with the mixed design in which qualitative and quantitative methods are used together. *The explanatory sequential mixed method* was used for the data collection process. In this method, firstly the study process started by choosing, collecting and analyzing the quantitative data than qualitative data are collected (Creswell and Plano Clark, 2015, p.89-p.91). The part in which the qualitative method was used in the present study was designed in accordance with the single group interrupted time series design of the quasi-experimental design. In this design before and after the experimental procedure data are taken from the study group at certain intervals then data is analyzed (Creswell, 2012). Interview technique was used in the qualitative part of the study. The semi-structured interview form was used in order to identify the prospective teachers' experience during the study.

The Aim and Questions of the Study: Effective strategy training is needed within the scope of teacher competencies. Therefore, content should be added to the lessons given in the faculty within the scope of developing instructional strategies. In this context, a model for instructional strategy has been developed in this research. The more functional and effective this model is, the more important it is for teacher education.

The participants prepared an activity by associating the grammar topics with related language skills. Therefore, participants were not limited to make a selection for grammar topics and language skills. Because in the research, the effectiveness of both models related to the strategy training was examined. The principal aim of the study is to determine how prospective teachers design a teaching process in accordance with the cognitive constructivism strategies [Revised Bloom's Taxonomy (RBT) and 5E Model]. In order to achieve this aim the following research questions were examined.

1. How is the efficiency of the training based on the cognitive constructivism strategies?
2. How is the functionality and achievement of the cognitive constructivist strategies on the prospective teachers' designing activity skills (by associating grammar topics with related language skills)?
3. How are the prospective teachers' thoughts and feelings on the functionality of the cognitive constructivist strategies in the teaching process design?

Study Group

The study was carried out in the fall of the Academic Year of 2018-2019 in a state university with 31 prospective teachers (14 female, 17 male) in the Department of Turkish Language Education. The study was carried out in the scope of the lesson named *Contemporary Approaches in Turkish Education*. Because the content and scope of the study are closely related to the content of this lesson. Thus, prospective teachers availed themselves of the opportunity to acquire the knowledge within the scope of their lesson by applying and examining. In addition, the prospective teachers' activity designing skills were evaluated before to be a teacher.

Data Collection and Implementation Process

Practices of the first week: In this step, participants' pre-learnings about 5E Model, RBT, and cognitive and constructive approaches were identified. Based on the data gathered, the participants' needs in this regard were assessed and the level of their theoretical knowledge and their proficiency level to design suitable activities were identified. Participants were provided with feedback about the identified needs and deficiencies. Through that feedback, participants noticed their needs and prepared a needs list for this aspects. According to the data, participants' needs were mainly in the following aspects:

- a. Lack of theoretical knowledge about cognitive and constructivist educational approaches
- b. Lack of theoretical and experimental knowledge about designing activities.

Practices of the second and third weeks: In this step, training was provided to the participants about the 5E Model, RBT, and cognitive and constructive approaches according to the needs assessment. Qualitative interviews were carried out with the participants in order to identify

whether they fully learned what had been given and to clarify any pending issues. The points where full learning was not realized were revised, retold and clarified.

Practices of the fourth week: In this step, knowledge was provided about strategies on how to use the 5E Model and RBT in the activity designing process by associating the grammar topics with related language skills.

Practices of the fifth week: Activity designing started in this step. Participants designed activities by using the knowledge they had learned about the 5E Model, RBT, and activity designing process. At this stage, participants first identified a language skill and associated grammar topic(s) to use in their activities. Then participants designed their activities in accordance with the 5E Model about topics they had identified related to the objectives and contents of the Turkish Lesson Curriculum. Then, they reviewed and evaluated their activities based on the rubric developed previously.

Practices of the sixth week: Similar to the previous step, participants first identified a language skill and associated grammar topic(s) to use in their activity. And then they designed activities in accordance with the RBT about topics they had identified related to the objectives and contents of the Turkish Lesson Curriculum. Then, they reviewed and evaluated the activities based on the same rubric.

Practices of the seventh week: Participants evaluated the achievement levels of the activities they had designed in accordance with the 5E Model and RBT by making comparisons with reference to the items and dimensions in the rubric. Based on the achievement levels of the activities and by means of self-assessment, peer assessment, and expert assessment, the functionality of the strategies that were used was discussed.

Practices of the eighth week: The activity designing process and the functionality of the 5E Model and RBT were discussed by the participants in a comparative way in three categories. These categories are as follows: The functionality of the 5E Model and RBT; the coherency between the activity and the educational approach it is related to; cognitive and affective reactions about the teachability of the designed activity. The semi-structured interview survey was used in order to review these categories. The findings from the semi-structured interview survey were examined in accordance with the descriptive analysis. The results of the examination were shared with the participants and feedback on the designed activities was provided.

Data Collection Tools and Analysis of the Data

The rubric that was previously developed in order to evaluate those activities, semi-structured interview survey and 62 activities designed in accordance with the 5E Model and RBT were used as data collection tools.

A rubric was used in order to analyze and evaluate the activities designed by the participants in accordance with the criteria identified. The rubrics developed by Sönmez (2019a; 2019b) was adapted and used in this study. Especially the rubric evaluating the activities prepared for listening and monitoring skills according to the cognitive categories of RBT is closer to the aim of this study (Sönmez, 2019a). In this study, which evaluated the ability to prepare activities according to the cognitive constructivism strategies, this rubric was used by making changes to

the rubric developed by Sönmez. These changes generally include content related to the 5E model. Therefore, the rubric developed by Sönmez (2019a) was adapted to this study by adding the contents related to this research.

To measure sub-groups the analytic rubric categorizes the general performance characteristics. Thus definitions of the levels of different performances related to each sub-groups are done. The dimensions and items of the rubric draft were checked and Lawshe analysis was done. Lawshe analysis consists these steps respectively: determining the expert group, preparing the candidate scale forms, receiving experts' comments, identifying the content validity ratio for the items, determining the content validity indexes for the assessment and determining the final form in accordance with the criteria of the content validity ratio indexes. The experts scored each item as “*this item measures the target structure*” (value 2), “*this item is related to the structure but redundant*” (value 1) and “*this item does not measure the target structure*” (value 0). To content validity, Lawshe analysis can be used to receive expert view or opinion for aspects as the suitability/ comprehensibility of each item for the sample group (Lawshe, 1975). The designed rubric was given to three experts in the field of Turkish Education and five Turkish Language teachers. Thus six activities were examined by the raters randomly. The agreement percentage between the assessments by the raters was examined. In this study the notation [$P = \frac{Na}{Na + Nd} \times 100$] “Agreement percentage = agreement amount/ (agreement + disagreement) x 100” for the agreement percentage is used (Miles and Huberman, 1994, p. 64). The result of the calculation between the raters was found as 85% (agreement percentage). And then the rubric was developed with 29 items and five dimensions (activity draft, content of activity related to the model, introduction part of the activity related to the model, development part of the activity related to the model, and completion part of the activity related to the model). And the product evaluation process consists of three achievement levels as “Insufficient, Should be Developed, and Successful” (For more detail see Table 2).

The prepared activities were examined with the rubric. For each item, the values of 2 (the related criterion completed correctly and completely), 1 (the related criterion completed incompletely) and 0 (if the part for the relevant criterion null or there is an incorrect or irrelevant answer) were rated. After rating, the arithmetic average of the items for every dimension in the rubric was found. Thus the achievement levels of the designed activities were examined according to their proximity or distance to arithmetic average. Achievement levels of activities depending on their proximity to arithmetic average determined as: 0-0,49 [Insufficient (I)], 0,5-0,9 [Partially Insufficient (PI)], 1-1,4 [Should be developed (SD)] and 1,5-2 [Successful (S)] (Osgood, Suci, And Tannenbau, 1959). As a matter of fact, in previous studies, it was determined that the rating made according to this method made suitable and effective measurements (Sönmez, 2019a; Sönmez, 2019b).

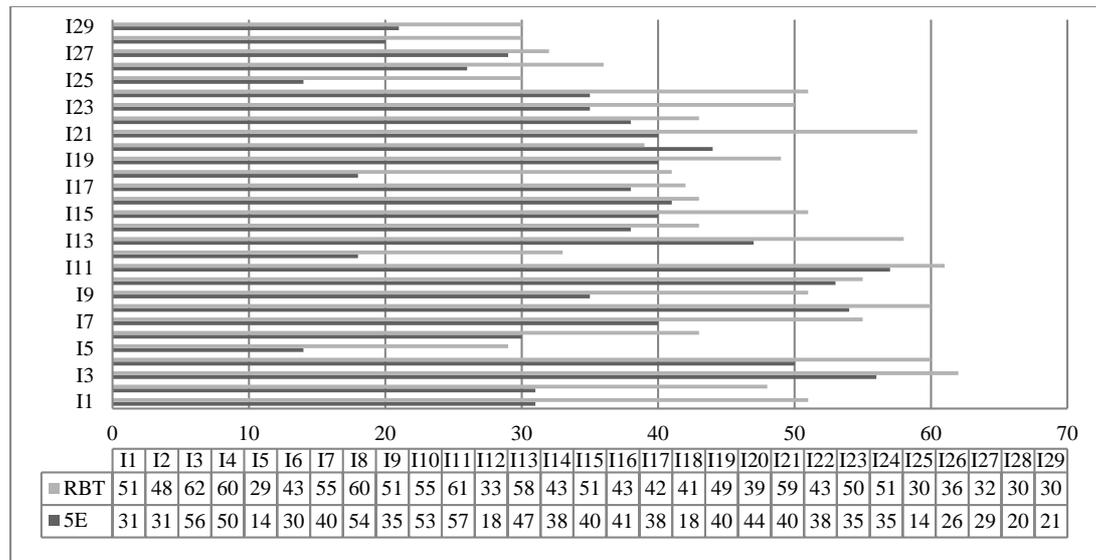
Three open-ended questions (item) asked to the participants in the scope of the interview carried out in the qualitative part of the study. The semi-structured interview survey that was prepared based on three main themes was presented to three experts in the field for their comments. By means of the finalized survey, participants' comments and observations were recruited about the functionality of the 5E Model and RBT, the coherency level of the activity with the educational approach it is related to and the teachability of the designed activity. The items and participants were coded as “I.1, I.2, I.3” / “P1, P2, P3, P4, P5”. By descriptive analysis the findings related to the semi-structured interview were classified in the frame of certain themes (Yıldırım and Şimşek, 2013, p.256-p.258). Based on the similarities to each other the classification of these

themes did as: the experience about the 5E Model and RBT, the coherency level of the activities with the educational approach, and the teachability of the designed activities. Data collected in accordance with the descriptive analysis were evaluated under the relevant theme. In this context, the effectiveness of the qualitative analysis by this method has been determined in previous studies (Sönmez, 2019a; 2019b).

Results

This section deals with the findings on the research questions. In this scope, knowledge was provided about the strategies that would be used in the introduction, development and completion parts of the activities to be designed during training. During the eight weeks, strategies for teaching process in accordance with RBT and 5E Model was used and activities were designed. Relevant findings on the 62 activities designed by 31 participants are given in detail below.

Findings on the first research question



Graphic 1. Achievement levels of the activities according to the dimensions in the rubric

The evaluation results of the activities designed in accordance with 5E and RBT on the five dimensions of the rubric are shown in Graphic 1. In order to assess the realization level of the objectives, each objective was added to the rubric as an item. Based on the achieved level of these items, both the realization level of the objectives and the achievement of training were tested and evaluated. Achievement levels of the activities designed in accordance with 5E and RBT were examined based on the results derived from the total values of the average scores calculated according to the five dimensions. Thus, the achievement level of activity was identified according to each dimension by summing up the arithmetic averages of the scores that 5E Model-oriented and RBT-oriented activities.

In the first part of the activity, participants were given training on preparing an activity plan before starting to design an activity that include a language skill and associated grammar topic(s). The aim was to inform prospective teachers about preparing the education plan in both models. Training content was organized to that end. Based on this content, seven items (objectives) were prepared. How this information given in the first stage of the training was used in 5E and RBT is given in the first dimension of the rubric. Item one (I1) in this dimension examines participants' level of designing and using suitable materials for the activity they design. It is understood from the graphic that participants prepared materials for both models but they were much better in preparing materials suitable for RBT. Item two (I2) examines the ability to associate language skills (reading, writing, and verbal communication) and grammar with relevant content. It was noted that participants used the language skills successfully in the activity for both models but the achievement rate was higher in RBT. Item three (I3) examines whether active participation in the learning process by students is ensured. When both activity groups are compared, it is seen that the achievement levels in these items are quite high and close to one another. Item four (I4) in this dimension examines the successful command of language (narration). Participants exercised a good command of language in the activities for both models but the achievement level is higher in RBT-oriented activities. Item five (I5) examines whether sufficient knowledge has been for the metacognitive domain in the designed activities. The Graphic indicates the participants had difficulty in this part most since this item was used insufficiently and poorly in both RBT-oriented and 5E Model-oriented activities. Accordingly, it can be concluded that the participants either did not fully lean the contents of the metacognitive domain during the training or they had difficulty in integrating that knowledge into the activities. Item six (I6) examines to what extent the participants integrated the knowledge they acquired about the affective domain in the relevant training into their activities. It is observed that the achievement level of this item is higher than the one in the metacognitive domain. This finding suggests that the participants acquired the knowledge about the affective domain much better and integrated it into the activities more successfully. Item seven (I7), examines to what extent the relevant methods and techniques were applied in the parts of the designed activities. Findings showed that the participants used the methods and techniques successfully in both models. However, the achievement level was higher in RBT. This indicates that the information provided about the methods and techniques was used in the activities to a great extent.

In the second step of the training, knowledge was provided on how to organize and render the knowledge in the activities that include a language skill and associated grammar topic(s). In this scope, the participants were provided knowledge about how to use the sub-categories of the 5E Model and the knowledge dimensions of RBT while designing the activities that include a language skill and associated grammar topic. Following that, the criteria that should be observed in those contents were explained. Graphic 1 shows the findings on to what extent the criteria determined for the course contents were integrated into the activities (the second dimension). In this scope, item eight (I8) in this dimension examines whether the contents in the activities have been delivered in an understandable language or not. According to the Graphic, in both RBT-oriented and 5E Model-oriented activities, the contents were given in a simple, fluent and understandable. Therefore, it can be concluded that the training given in this scope has been successful. Item nine (I9) examines whether the knowledge load in the activities is in accordance with students' interests, learning needs and learning speed. Findings indicated that the knowledge load in RBT-oriented activities has been organized successfully in accordance with students' interests, learning needs and learning speed. RBT has been determined to be more functional in this regard. Item ten (I10) examines whether the topics in the activities designed for

both models are scientific, valid and reliable. Findings in this regard show that the topics in the RBT-oriented and 5E Model-oriented activities are scientific, valid and reliable to a large extent, which indicates the training given in this regard has been successful. Item eleven (I11) examines whether activity topics are related to daily life. Findings suggest that the contents designed for both models are useful and related to daily life. Item twelve (I12) examines whether the designed contents allow for social values (distinguishing good from bad, right from wrong, etc.) or not. Findings in this regard show that not enough has been allowed for social values in the designed activities. This finding indicates that the participants did not fully grasp the training content in this regard, thus, they were not able to integrate the relevant knowledge into the activities successfully. Item thirteen (I13), the last item of this dimension, examines whether the topics in the designed activities have been rendered in accordance with the teaching principles or not. Findings in this regard show that the topics in activities designed for both models have been rendered in accordance with the teaching principles. It can be concluded that the training given in this regard has been successful.

In the third step of the training, knowledge was provided on the strategies to be used to design the introduction part of the activities (include a language skill and associated grammar topic), which were supposed to be designed in three phases. Graphic 1 shows the results on how the preparation, raising curiosity and remembering phases of the introduction part of the activities prepared according to this strategy were designed (the third dimension). These properties were evaluated based on six items in the rubric. Among them, item fourteen (I14) examines how the new contents are associated with students' pre-learnings. The results thereof indicate an effort to associate the designed activities with pre-learnings. However, the achievement level is not close to the target level. Especially, it was noted that the achievement level for associating new content with students' pre-learnings is much lower in the 5E Model. Item fifteen (I15) examines to what extent students' sense of curiosity, and questioning/researching skills are involved in the introduction part of the activities. Data in this scope show that much more coverage has been spared for students' sense of curiosity and questioning/researching skills in the RBT-oriented activities. Item sixteen (I16) examines whether a needs assessment has been carried out for the content in the designed activities. The results in the Graphic indicate that in the RBT-oriented and 5E Model-oriented activities the coverage for needs analysis is close to one another. With regard to the achievement levels, it can be suggested that the achievement level of the activities is of an intermediate level. Item seventeen (I17) examines whether the introduction part has been designed in coherence with the purpose and the whole part of the entire activity. Findings in this regard resemble the findings of the previous item. In other words, in both models, the purpose of the activities has been moderately associated with the entire activity. Item eighteen (I18) examines whether the designed activity allows identifying the interests, attitudes, and experiences related to the target topic. Findings in this regard suggest that the 5E Model-oriented activities do not allow identifying the interests, attitudes, and experiences related to target topic sufficiently. In the RBT-oriented activities, the achievement level for this item is higher but close to the target level at the intermediate level. Finally, item nineteen (I19) examines to what extent the designed activities allow students to remember (retrieving) their pre-learnings about the target topic. Data show that activities designed for both models allow students to remember their pre-learnings about the target topic. In RBT-oriented activities, however, this knowledge seems to have been better integrated into activities.

In the fourth step of the training, knowledge was provided on the strategies to be used to design the development part of the activities that include a language skill and associated grammar

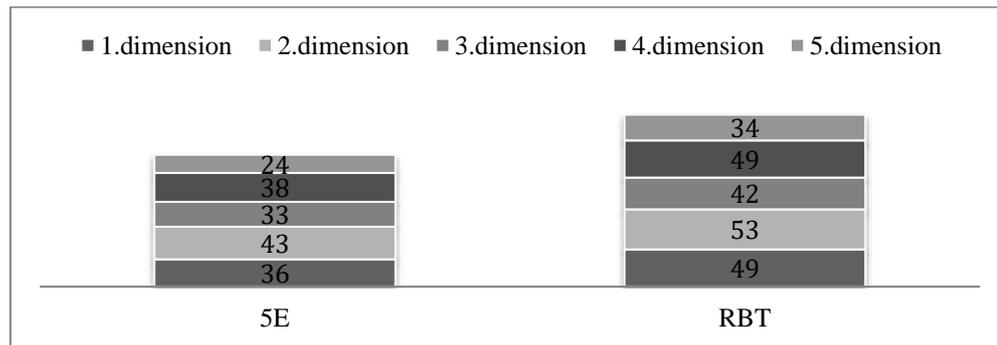
topic(s). In this scope, first, knowledge was provided about the cognitive processes of understanding (interpreting, exemplifying, classifying, concluding, comparing and explaining); applying (executing, realizing); analyzing (sorting, organizing and scrutinizing); evaluating (auditing and criticizing) and creating (generalizing, planning and structuring) of RBT. Then, knowledge was provided about the exploring (facing the problem, solving the problem, explaining the problem, presenting the solution ways, transferring the knowledge); elaborating (presenting a problem case) and evaluating phases of 5E Model. Participants were informed about how to use of this knowledge as a strategy in the development part of the activity. Items related to this knowledge were added to the fourth dimension of the rubric in order to determine how that knowledge was integrated into the activities designed. Item twenty (I20) examines whether the activities are designed in accordance with the cognitive processes of introduction (raising curiosity, reminding, being ready) and understanding (interpreting, exemplifying, classifying, concluding, comparing and explaining). Data in this regard show that these phases were realized in the activities for both models, however, it was noted that 5E Model-oriented introduction activities were designed more successfully. Item twenty-one (I21) examines how the cognitive processes of exploring (facing the problem, solving the problem)/applying (executing, realizing) were used in the activities. Results of the data indicate that activities were designed in accordance with this step. Contrary to the previous step, it was found that applying the category of RBT was used more efficiently as a strategy in this step. Item twenty-two (I22) examines the achievement level of the activities to be designed in accordance with the phases of explaining (presenting the solutions for the problem, transferring the knowledge)/analyzing (sorting, organizing and scrutinizing). Although the achievement level of RBT-oriented activities is higher, in general, for both models are close to one another in terms of achievement. Item twenty-three (I23) examines how the activities were designed for the phases of elaborating (presenting the problem)/evaluating (checking, critiquing). Data in this regard show that evaluating category in RBT is more efficient in this stage since RBT-oriented activities were designed more successfully and efficiently than 5E Model-oriented activities. Item twenty-four (I24) examines how the activities for evaluating (self-assessment, peer-assessment, and teacher's assessment)/creating (generalizing, planning and structuring) phases were organized. The graphic indicates that creating phase in RBT has been more efficient in this step since RBT-oriented activities have been designed more successfully and sufficiently than 5E Model-oriented activities.

In the fifth step of the training, knowledge was provided about the strategies to be used in order to design the completion part of the activities that include a language skill and associated grammar topic(s). Thus, the participants were provided with information about self-assessment, peer/group assessment and teacher's assessment and the assessment tools to be used for these assessment types so that they could evaluate the activities they had designed. To determine how this knowledge was integrated into the activities by the participants, five items (objectives) were prepared related to the content about this knowledge. Knowledge given in the last phase of the training is included in the fifth dimension of the rubric. In this scope, item twenty-five (I25) examines whether the designed activities allow for self-assessment or not. Results in this regard indicate an achievement level far lower than the previous step. That knowledge was integrated into 5E Model-oriented activities less successfully whereas it was integrated into RBT-oriented activities more successfully. This result suggests that knowledge about self-assessment has been used insufficiently in the activities. Item twenty-six (I26) examines whether the designed activities allow for peer/group assessment. The graphic shows that participants have been more successful in peer assessment in comparison to self-assessment for two models. Item twenty-

seven (I27) examines whether the designed activities allow for the teacher's process/product assessment. Results thereof show that although activities for both models allow for teacher's process/product assessment almost in the same ratio, the targeted achievement level is not high. Item twenty-eight (I28) examines the nature of the measurement-assessment process and how the student performance is evaluated functionally in the designed activities. Data for this item show that in the activities for both models neither measurement-assessment process has been covered sufficiently nor student performance is evaluated functionally. Finally, item twenty-nine (I29) examines whether the measurement-assessment process has the capacity to give feedback about incomplete learnings. In other words, it examines whether students are provided with feedback for their incomplete learnings identified in the evaluation phase of the activities. Results thereof show that not enough feedback is provided in the activities designed for both models. Still, it can be concluded that RBT has proved to be more efficient in this step. The achievement level of the items in this dimension is much lower than the achievement levels of the items in the other four dimensions. This finding shows that the participants either did not fully learn the content of the training or did not fully integrate the knowledge given in this scope into the activities. In this section, the findings of RBT support the results of the previous study (Sönmez, 2019a). Therefore, it has been determined that the cognitive-based approach (RBT) can be used to develop an effective measurement tool for the assessment of activities.

Finding on the second research question

This section of the study deals with the efficiency of the 5E Model and RBT in the activity designing process. In this scope, participants were given training on how to use strategies for the 5E Model and RBT in the five-stage activity designing process. At the end of the training, activities were designed according to both models. Each stage of the activities that were designed in five stages was evaluated in accordance with the rubric. Findings from this evaluation are given in Graphic 2.



Graphic 2. The activities evaluated in accordance with the rubric

The first dimension of Graphic 2 shows the results on how the activity designing plan was prepared prior to design the draft activity that includes a language skill and associated grammar topic(s). In order to determine the achievement level in this scope, the total scores of the arithmetic average for seven items were checked. Thus, the achievement levels of the activities designed for the 5E Model and RBT were determined. When the achievement levels of the activities designed for both models are compared (Graphic 2, first dimension), different results are derived. Findings on this dimension show that RBT has been more efficient in the activity

designing process. The total value of the arithmetic averages for 31 activities in the first dimension is more successful than 5E. In other words, RBT has been a more successful tool in the activity plan creating process compared to the 5E Model. The second dimension of the graphic examines the points that should be taken into account during the organization and transfer of knowledge to be delivered in the 5E Model-oriented and RBT-oriented draft activities. In this scope, participants were informed about the ways to utilize the knowledge dimensions of RBT while designing the activity contents. The criteria that should be observed in the activities to be designed are indicated in the rubric. Based on the results derived from the rubric, the efficiency of the RBT and 5E Model was tested. It was found that RBT is more efficient than the 5E Model in the content organization. Based on this finding, it can be concluded that RBT has proved to be an effective strategy in the content organization phase for the factual, conceptual, procedural and metacognitive knowledge domains.

The third dimension in the graphic examines the efficiency of the engagement and exploration of the 5E Model and sub-cognitive phases of remembering in RBT while designing the introduction step (preparation, raising curiosity and remembering) of the activities. When the data for both models are compared, results show similarity with the previous stages since RBT is more efficient than 5E in designing the introduction part. Therefore, it can be concluded that recalling, retrieving, etc. the sub-cognitive processes of remembering in RBT can be used as an efficient strategy to design the introduction part (preparation, raising curiosity and remembering) of the activities. The fourth dimension of the graphic examines the efficiency of the cognitive processes of understanding, applying, analyzing, evaluating and creating in RBT and the phases of exploring, explaining, elaborating and evaluating the 5E Model to design the development part of the activity. These results indicate that RBT has proved to be a more efficient strategy in the development stage of the activity. It was found that RBT was more efficient than the 5E Model in the design of the development part. This finding emphasizes that RBT is a more efficient tool than the 5E Model in the design for the development part of the activities. The fifth dimension examines the efficiency of RBT and the 5E Model in the evaluation process of the activities in the completion part. It was noted that neither the RBT nor the 5E Model proved to be an effective evaluation tool. In addition, when the efficiency of both models is compared, it is understood that RBT has been a more effective strategy in the completion part of the activity. Based on this finding, it has been concluded that RBT has been used more efficiently as a strategy in the evaluation process of the activities. This finding supports the results of previous studies emphasizing the effectiveness of the cognitive domain-based teaching process. Because the cognitive domain was found to be successful in organizing the teaching process as a strategy (2012; Azumi, 2008; Meang, 2006; Olson and Land, 2007; Fenstermacher and Richardson, 2005; Griffiths, 2004; Holden, 2004; Martinez, 1996).

The effectiveness of this method, which was followed in the process of preparing strategy training and developing a rubric to the activity preparation process, was examined in previous researches. In these studies, prospective teachers were provided with strategy training for preparing and evaluating activities for effective listening and monitoring skills training. The activities prepared at the end of this strategy training were evaluated with the rubric developed in accordance with this method. As a result of the analysis, it was found that both the strategy training and the developed rubric are effective and functional to the assessment of listening and monitoring skills (Sönmez 2019a). In another study, the functionality of the rubric developed in accordance with this method as a tool in the language skills education process was examined. In this context, the effectiveness of the method used in measuring writing skills was examined.

According to the results, prospective teachers wrote successful stories in accordance with the aims of the study with the strategies given in the research. Then, they examined their stories with the developed rubric. As a result of the evaluation, it was determined that the rubric is an effective and functional tool in the process of evaluating writing skills (Sönmez, 2019b). Therefore, the findings of this study support the results of previous studies conducted in this context. Based on these results, the rubrics developed according to this method were found to be effective in developing a measurement tool for listening/monitoring skills, writing skills, and preparing activity according to cognitive constructivism strategies (5E and RBT) for language education.

Findings on the third research question

In this section, participants expressed their feelings and thoughts about 5E and RBT during the activity design process. Most of the participants stated that they had difficulty using the 5E model in the activity design process. This result supports the findings of previous researches on these aspects (Gökçe, Demirhan İşcan and Erdem, 2012; Panasuk and Lewis, 2012; Metin and Özmen, 2009). Therefore, participants generally stated that they found RBT to be more functional. Participants make the following observations about their experience with the 5E Model while designing the activities.

(I.1). *Observations about the experience of the 5E Model: 5E model was more effective in measuring the instrument preparation process. Because the stages of the 5E model were more useful (P1). The development stage is an important part of further elaboration of the activity. At this stage, I used RBT more effectively (P2). RBT and 5E model is similar in some aspects in the introduction stage of activity. Despite this similarity, I used RBT more effectively (P3). It was easier to prepare the activity according to RBT. Because I understood Revised Bloom's Taxonomy better in the process of preparing the activity (P4). It is easier to prepare the course material according to taxonomy. Because cognitive processes are a good guide in designing the material (P5).*

(I.2). *Observations about the coherency level of the activities with the educational approach are related to the content organization process: In this part of the study, participants stated to what extent the activities they had designed were related to the cognitive and constructive approaches. In this scope, participants' observations about whether 5E Model-oriented and RBT-oriented activities they have designed are related to the cognitive and constructive approaches are as follows.*

RBT is more functional in the course content preparation process. Because the topics are divided into types of information. This provided me with a more planned preparation (P1). RBT is also functional in organizing the content of the activity. RBT is more effective than 5E in the process of preparing content according to cognitive categories (P2). Both models are functional in the content editing process. However, compared to these, the functionality of RBT is more dominant (P3). I think the taxonomy is more functional in the content designing process. Because I have determined that taxonomy is more functional than the 5E to prepare content that is appropriate for cognitive categories (P4).

(I.3). *Observations about the teachability of the designed activities: The participants were asked whether they could implement the activities they had designed in the classroom environment or*

not. In this scope, participants' observations about the 5E Model and RBT are as follows. *RBT can be more functional in the classroom environment because it gives the student a belief in creating new products at the level of creation (P1). 5E model gives the opportunity to the student for learning by doing. Therefore, the 5E model can be more functional in practice (P2). It's important to design activities according to the 5E model. However, I think it is not very useful in the classroom (P5).*

Conclusion and Suggestions

It is the fact that prospective teachers are able to design the teaching process according to different educational models is a crucial need. Due to this crucial need, it is aimed to teach different methods, techniques, and strategies in the curricula of education faculties. The present study examines the efficiency of the cognitive constructivism strategies-based 5E Model and cognitive process-based RBT in the teaching process. The functions of both approaches in the design of teaching activities are quite important. Constructive educational approach and RBT are among the cornerstones of education. The function and use of none can be ignored in the education-teaching process. Doing a comparative study of these two crucial educational approaches makes the present study more important and necessary as the literature review in this regard showed that experimental studies comparing cognitive and constructive educational approaches are limited. Studies in this regard focus in general on behaviorism (Dale, 2004; Moore, 1999; Tomic, 1993) or only on cognitive approach (Azumi, 2008; Olson and Land, 2007; Meang, 2006; Holden, 2004; Griffiths, 2004; Martinez, 1996). And also some studies, on the other hand, focus merely on the constructive approach (Akkuş, 2014; Gökçe, Demirhan İşcan, and Erdem, 2012; Metin and Özmen, 2009; Bay and Karakaya, 2009; Fox, 2001). Thus the present study fills a niche in the literature as it experimentally compares the efficiency of constructive educational model and cognitive approach.

The present study with its comparative method produced remarkable results. The examination of the findings suggests that the training on how to use strategies for the 5E Model and RBT has been successful in general. This result supports the view that the constructive approach and RBT are efficient tools in the education-teaching process (Akkuş, 2014; Gökçe, Demirhan İşcan and Erdem, 2012; Azumi, 2008; Metin and Özmen, 2009; Bay and Karakaya, 2009; Olson and Land, 2007; Meang, 2006; Holden, 2004; Griffiths, 2004; Fox, 2001; Martinez, 1996). Details of these results indicate that these two models have different levels of efficiency in prospective teachers' activity designing proficiency. In the Findings section, details of this difference are given by the realization level of the objectives of training (Graphic 1). Results in Graphic 2 show that the usage rate of the knowledge provided in the training differed by 5E Model and RBT. Data in this regard show that RBT-oriented training has been more efficient on prospective teachers' activity designing process. The very factor has also been efficient on the success of the designed activities. Please refer to Table 1 to see a comparative analysis of the achievement levels of 5E Model-oriented and RBT-oriented activities.

Table 1 shows that RBT has been pretty effective and successful in the participants' activity designing skills. When parts of the activities designed according to the model are compared one by one, it is understood that RBT is a more efficient strategy. Because certain parts of 5E Model-oriented activities are at a lower level of achievement. And in RBT-oriented activities, every part has a sufficient level of achievement. Previous studies in this regard revealed that prospective teachers had difficulty in designing and implementing 5E Model-oriented activities. These problems are usually related to insufficient implementation, can not ensure discipline, and can

not make associations with daily life, etc. (Metin and Özmen, 2009). The present study revealed similar results. Another study revealed that teachers cannot realize 5E Model-oriented teaching activities (Gökçe, Demirhan İşcan and Erdem, 2012). In the present study, it was found that prospective teachers designed certain dimensions of 5E Model-oriented activities (especially the fifth dimension) incompletely or insufficiently. Details of this result are given in the table above where the achievement levels of the activities are evaluated.

Table 1.

Achievement of the activities in accordance with the 5E Model and RBT

Activity Designing Model	5E Model				RBT			
	<i>S/f</i>	<i>SD/f</i>	<i>PI/f</i>	<i>I/f</i>	<i>S/f</i>	<i>SD/f</i>	<i>PI/f</i>	<i>I/f</i>
Achievement Level								
1st dimension	5	19	5	2	20	10	1	-
2nd dimension	17	9	5	-	27	3	1	-
3rd dimension	11	6	8	6	18	10	1	2
4th dimension	8	18	4	1	21	7	3	-
5th dimension	6	6	8	11	11	8	4	8

One of the important results of the present study is the functionality of the cognitive processes of RBT in the activity designing process. Similar to the previous studies, the impact of cognitive-based strategies on the teaching process has been emphasized once again in the present study (Yulisa, 2018; Kassem, 2015; Graham, Santos, and Vanderplank, 2011; Fenstermacher and Richardson, 2005). These results also support the findings of the previous studies which indicated that a teaching process that has been designed in accordance with cognitive strategies is realized in line with the purposes and in a successful way (Sönmez, 2019a; Azumi, 2008; Olson and Land, 2007; Meang, 2006; Holden, 2004; Griffiths, 2004; Martinez, 1996).

Table 1 shows that the training on strategies suitable for both models has been pretty effective and successful in participants' activity designing skills in line with the purpose of the training. This result once again emphasizes how important strategy training is in teachers' professional proficiency (Sönmez, 2019a; Sönmez, 2019b; Gebre and Tadesse, 2015; Graham, Santos, and Vanderplank, 2011). The dimensions in the activities designed for both models were used successfully. This result indicates that the RBT and 5E Model have proved to be effective tools for prospective teachers to design learning environments by using effective strategies.

It is realized that certain dimensions in both RBT-oriented and 5E Model-oriented activities are pretty close to one another. The basic reason for this closeness is the interaction between cognitive and constructive approaches, which was previously stressed in previous studies. In spite of this closeness, it is still difficult to suggest that *cognitive constructivism*, as Derry (1996) put it, really exists. Results from experimental studies to be conducted on different axes are needed in order to reach such a conclusion.

Language education through strategies is an important issue both for effective language learning and teaching. In this context, a lesson for prospective teachers to learn effective strategies and to

use strategies in the teaching process should be added in the Curriculum of Turkish Language Teaching Undergraduate. At the same time, the content of the target lessons should be enriched with relevant strategies. Strategies should be added to the content especially related to the education of reading, writing, speaking and listening skills. Because it is needed about teaching strategies on how these skills should be developed more effectively along with students' cognitive, affective, and metacognitive developments. In this context, the previous research focused on how to use strategies suitable for cognitive, affective, and metacognitive domains within the context of writing education. In this scope, the prospective teachers were given training on story writing and on how to measure and evaluate their stories according to the target strategy (Sönmez, 2019a). In another study within this scope, training was given to the prospective teachers about the activity preparation strategies that will improve the listening and monitoring skills. The activities were prepared with these strategies and then training was given about how to measure the activity prepared according to these strategies (Sönmez, 2019b). As a result, in both types of research, it was determined that prospective teachers learned professional knowledge better through strategies. And in this research, the prospective teachers were given training about preparing and evaluating activities for Turkish lesson with strategies prepared according to the cognitive-constructivist approach. In these three kinds of research, the effectiveness and functionality of the strategy training and the measurement tool (the rubric) developed according to this strategy training were assessed. It has been determined that strategy training and measurement tool used in these three studies are effective and functional in the process of measurement and evaluation to develop relevant skills.

This educational method is aimed to be achieved in these related studies: *Designing an effective teaching method that includes the language teaching, measurement, and assessment processes*. In order to realize this aim, more experimental studies are needed which examine different aspects of language education. Because is necessary to reach more comprehensive conclusions regarding the effectiveness of this strategy training and the rubric developed in language education in accordance with this method. Therefore, it is necessary to examine the function of this strategy training and the effectiveness of the rubric developing method in reading, speaking, and grammar teaching processes. Researchers are advised to study this focal point. Thus, depending on the synthesis of these studies, more precise conclusions will be reached regarding the successful level of strategy education that meets the needs of language education by this method.

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Appendix

Table 2.

The Rubric^a

Dimensions	The criteria	Value ranges of items ^b	\bar{x}^c/f	Success level ^d
Evaluation of the activity draft (1 st dimension)	Recommended the material	Material is not provided or material is not clearly stated (0), material is insufficient (1), material is enough provided (2).		
	The relationship between language skills and grammar topic.	Language skills (reading, writing, and verbal communication) and grammar not associated (0), language skills and grammar associated deficiently (1), language skills and grammar associated successfully (2).		
	Student participation	There is no student practice in all three stages of the activity (0), there is student activity less than two stages of the activity (1), there is student practice in all three stages of the activity (2).		
	Narrative	The narrative of the activity is not interrelated in three parts (0), the narrative of the activity is interrelated less than two parts of activity (1), the narrative of the activity is given interrelated in three parts (2).		
	Metacognitive domain	There is no metacognitive domain (0), there is a metacognitive domain less than one part of the activity (1), there is a metacognitive domain in three-part of the activity (2).		
	Affective domain	There is no affective domain (0), there is an affective domain less than one part of the activity (1), there is an affective domain in three-part of the activity (2).		
	Methods and techniques	There are not methods and techniques (0), methods and techniques are insufficient (1) methods and techniques are enough provided (2).		
The content of the activity (2 nd dimension)	Fluent expression	The expression of the activity is not understandable (0), the expression of the activity is understandable (2).		
	Load of knowledge in the content	There is not the target content in all part of the activity (0) there is the target content less than two part of the activity (1), there is the target content in all parts of activity (2).		
	Reliability of knowledge	All subjects in the content are not scientific, valid and reliable (0), some subjects in the content are not scientific, valid and reliable (1), all subjects in the content are scientific, valid and reliable (2).		
	Useful and associated with daily life	All subjects in the content are not useful and not associated with daily life (0), some subjects in the content are not useful and not associated with daily life (1), all subjects in the content are useful and associated with daily life (2).		
	Social values	The activity includes social values (good-bad, right-wrong, etc.) (0), the activity not includes social values (2).		
	Compliance with teaching principles	The subjects in the content are not given in accordance with the teaching principles (0), the subjects in the content are given in accordance with the teaching principles (2).		
The introduction section of the activity (3 rd dimension)	Associating with prior knowledge	Pre-learning of the target subject is given (2)/not given (0).		
	Curiosity, inquiry, and research skills	Students' curiosity, inquiry, and research, etc. are given (2)/ are not given (0).		
	Need analysis	Students' need is given (2)/ is not given (0).		
	Purpose of the activity	The introductory section was designed to be consistent with the purpose and effectiveness of the activity (2)/ was not designed (0).		

^a Adapted from (Sönmez, 2019a, p.149 and Sönmez, 2019b, p.124-125).

^bSufficient (2), Partially Insufficient (1), and Insufficient (0)

^c0-0,49: Insufficient (I)

0,5-0,9: Partially Insufficient (PI)

1-1,4: Should be Developed (SD)

1,5-2: Successful (S)

^dI,PI, SD, S

	Interest, attitude, and experiences	Students' interests, attitudes, and experiences are given (2)/ are not given (0).
	Include pre-knowledge	There is students' pre-knowledge (2)/ there is no pre-knowledge (0).
Development section of the activity (4 th dimension)	Understand/engage	There aren't sub-cognitive processes (interpreting, exemplifying, classifying, concluding, comparing and explaining)/(raising curiosity, reminding, being ready) (0); there are less than two sub-cognitive processes (1); there are more than three sub-cognitive processes (2).
	Apply/explore	There aren't sub-cognitive processes (executing, realizing)/(facing the problem, solving the problem) (0); there are less than one sub-cognitive processes (1); there are at least two sub-cognitive processes (2).
	Analyze/explain	There aren't sub-cognitive processes (sorting, organizing and scrutinizing)/(presenting the solutions for the problem, transferring the knowledge) (0); there are less than one sub-cognitive processes (1); there are at least two sub-cognitive processes (2).
	Evaluate/elaborate	There aren't sub-cognitive processes (checking, critiquing)/(presenting the problem) (0); there are less than one sub-cognitive processes (1); there are at least two sub-cognitive processes (2).
	Create/evaluate	There aren't sub-cognitive processes (generalizing, planning and structuring)/(self-assessment, peer-assessment, and teacher's assessment) (0); there are less than one sub-cognitive processes (1); there are at least two sub-cognitive processes (2).
Completion section of the activity (5 th dimension)	Self-assessment	The activity includes self-assessment (2) / not includes (0).
	Peer/group assessment	The activity includes peer/group assessments (2) / not includes (0).
	Teacher assessment	The activity includes teacher assessment (2) / not includes (0).
	Assessment of student performance	The activity includes indicating students' learning deficiencies (2)/ not includes (0).
	Provide feedback on learning deficiencies	Feedback was given about the students' learning deficiencies (2)/ was not given (0)

Summary

The principal aim of the study is to determine how prospective teachers design a teaching process in accordance with the cognitive constructivism strategies [Revised Bloom's Taxonomy (RBT) and 5E Model]. For this aim, the following research questions were examined. How the efficiency of the training is based on cognitive constructivism strategies? How is the functionality and achievement of the cognitive constructivist strategies on the prospective teachers' designing activity skills? How are the prospective teachers' thoughts and feelings about the functionality of the cognitive constructivist strategies in the teaching process design?

The explanatory sequential mixed method was used for the data collection process. In this method, firstly the study process started by choosing, collecting and analyzing the quantitative data then qualitative data are collected. The part in which the qualitative method was used in the present study was designed in accordance with the single group interrupted time series design of the quasi-experimental design. In this design before and after the experimental procedure data are taken from the study group at certain intervals then data is analyzed. The interview technique was used in the qualitative part of the study. The semi-structured interview form was used in order to identify the prospective teachers' experience during the study.

The evaluation results of the activities designed in accordance with 5E and RBT on the five dimensions of the rubric are shown in Graphic 1. In the study, objectives were prepared for the relevant parts. In order to assess the realization level of these objectives, each objective was added to the rubric as items. Based on the realization level of these items, both the realization level of the objectives and the achievement of training were tested and evaluated. Achievement levels of the activities designed in accordance with 5E and RBT were examined based on the results derived from the total values of the average scores calculated according to the five dimensions. Thus, the achievement level of a certain activity group was identified according to each dimension by summing up the arithmetic averages of the scores that 5E Model-oriented and RBT-oriented activities got from the first, second, third, fourth and fifth dimensions of the rubric. In addition, when the efficiency of both models is compared, it is seen that RBT has been a more effective strategy in the completion part of the activity. Based on this finding, it has been concluded that RBT has been used more efficiently as a strategy in the evaluation process of the activities.

The training on strategies suitable for both models has been pretty effective and successful in participants' activity designing skills in line with the purpose of the training. Because it is important that the insufficient dimensions in the activities designed for both models were used successfully. This result indicates that the RBT and 5E Model have proved to be effective tools for prospective teachers to design learning environments by using effective strategies. A remarkable result that has been derived during the activity designing process is that certain dimensions in both RBT-oriented and 5E Model-oriented activities are pretty close to one another. The basic reason for this closeness is the interaction between cognitive and constructive approaches, which was previously suggested in previous studies. In spite of this closeness, it is still difficult to suggest that *cognitive constructivism*, as Derry put it, really exists. Because results from experimental studies to be conducted on different axes are needed in order to reach such a conclusion.

In this study this educational method is aimed to be achieved: *Designing an effective teaching method that includes the language teaching, measurement, and assessment processes*. In order

to realize this aim, more experimental studies are needed which examine different aspects of language education. Because is necessary to reach more comprehensive conclusions regarding the effectiveness of this strategy training and the rubric developed in language education in accordance with this method. Therefore, it is necessary to examine the function of this strategy training and the effectiveness of the rubric developing method in reading, speaking, and grammar teaching processes. Researchers are advised to focus on the study in this context. Thus, depending on the synthesis of these studies, more precise conclusions will be reached regarding the successful level of strategy education meeting the needs of language education by this method.