Investigation of Pre-service English Language Teachers' Cognitive Structures about Some Key Concepts in Approaches and Methods in Language Teaching Course through Word Association Test

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Abstract

This study aims to map the cognitive structure of pre-service English language (EL) teachers about three key concepts related to approaches and methods in language teaching so as to discover their learning process and misconceptions. The study involves both qualitative and quantitative data. The researcher administered a Word Association Test (WAT) to 68 sophomore pre-service English language teachers attending teacher training program in two state universities in Turkey. Data obtained from key concepts and associated words were recorded in frequency tables. Concept maps that presented the cognitive structures of the pre-service EL teachers were drawn. The sentences written by the pre-service EL teachers about each key concept were analysed and categorized. The findings appear to indicate that pre-service EL teachers failed to learn the key concepts effectively. Some misconceptions related to the key concepts were detected both in concept maps and sentences. The results suggest that WATs as an alternative assessment technique should be used for in-depth evaluation of learning.

Keywords: Word association test, pre-service English language teachers, concept maps, approaches and methods in language teaching

1. Introduction

Teacher education programs provide two types of knowledge: theoretical and practical or declarative ad procedural respectively. The former is related with knowledge about teaching and learning whereas the latter is about classroom procedures. As to English as a Foreign Language teacher education programs, most of them offer theoretical courses in second language acquisition (SLA). Pre-service EL teachers are expected to acquire knowledge about how languages are learnt, methods and approaches of language teaching, classroom procedures, young learners, educational psychology and pedagogy.

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Several courses in language teacher education programs such as *Approaches and Methods in Language Teaching* are conducted to guide pre-service EL teachers to critically think and analyse and shape their beliefs and knowledge about language learning process. Such courses are critical components of a teacher education program in that they form the basis of teachers' subject matter knowledge and pedagogical knowledge, which in turn affect the quality of students' learning and their future teaching performances.

This study aims to investigate pre-service EL teachers' cognitive structures about some key concepts in issues in language teaching and learning, more specifically language acquisition and psychology of learning using a Word Association Test (WAT). WATs have been an effective tool in uncovering cognitive structures related to learning of concepts and detecting misconceptions. A review of literature reveals several studies in science teaching, especially in biology, using WATs about concept structures of students about some key words in the field. Yet, there are no studies, to the researcher's knowledge, done with pre-service EL teachers to investigate their concept structures about some key words or concepts in their declarative knowledge about issues in SLA. Therefore, it is believed that the present study might fill a gap in the literature.

1.1. Literature review

The constructivist paradigm assumes that knowledge is actively and individually constructed. That is to say, every individual may have different ways of organizing knowledge. Hence, investigating cognitive structures of individual students has gained prominence. Exploring learners' cognitive structures also help educators understand students' misconceptions (Tsai & Huang, 2002). Here it would be wise to define what is meant by cognitive structure. A cognitive structure may be considered as a hypothetical construct about how different kinds of knowledge and information are organized and the relationships of concepts in the long-term memory (Shavelson, 1974). As to the benefits of exploring learners' cognitive structure, educators may get information about students' prior knowledge, misconceptions or alternative conceptions if there are any. Thus, appropriate teaching strategies could be employed to successfully merge learners' past experiences, prior knowledge and new knowledge. In case of misconceptions, remedy work can be carefully carried out and conceptual changes can be tracked. In terms of assessing students' performance, techniques assessing beyond memorized knowledge such as true/ false or multiple choice exams or tests that require more than a single set answer may better indicate what students know and to what extend they comprehend the subject matter. The word association test (WAT) is considered as one of the alternative assessment techniques promoted by a constructivist viewpoint. It helps us understand what students have acquired and if there exists any misconception. "[It] is one of the commonest and oldest methods for investigating cognitive structure" (Bahar, Johnstone & Sutcliffe, 1999). WATs reveal cognitive mapping of what students have learnt and uncover misconceptions they may have. A final advantage often cited is analysing one's own cognitive structure illustrated as cognitive maps might lead to metacognitive awareness in learning (Tsai & Huang, 2002). This will help the learners be more autonomous and monitor their own learning. They will have an idea of their misconceptions, what they know and what they need to improve more.

The literature related to the identification of the students' cognitive structures and the use of WATs as alternative assessment means suggest an increasing graphic in the field of education. There are many studies using WATs in the literature. Some of them investigated pre-service teachers' cognitive structures and ideas (Kurt & Ekici, 2013; Aydın & Taşar, 2010; Bahar & at al., 1999; Cardellini & Bahar, 2000). Some studies identified misconceptions in the cognitive structure of the pre-service teachers (Selvi & Yakışan, 2004; Kurt, 2013; Kurt, Ekici, Aksu & Aktaş, 2013; Bahar & Özatlı, 2003; Işıklı, Taşdere & Göz, 2011; Ercan & Taşdere, 2010). Some other studies explored cognitive

structures and misconceptions of elementary students in science courses (Bilgin, Coşkun & Aktaş 2013; Ercan, Taşdere & Ercan, 2010).

As it can easily be seen, the areas that WATs are mainly used are biology, chemistry, mathematics and science education. However, very few empirical studies have been reported on the use of WATs in the field of English language teaching. Hui (2011) compared Chinese English language learners' mental lexicons to those of the native speakers by using a WAT. Students' cognitive structures revealed that there were significant differences. Greidanus and Nienhuis (2001) tested the quality of word knowledge of the French language learners by means of a WAT. Yet, to the researcher's knowledge there has not been conducted a research investigating pre-service EL teachers' cognitive structures in theoretical courses such as second language acquisition and approaches and methods in language teaching.

1.2. Rationale of the Study

As Seferoğlu (2006) states in order to bring uniformity and to meet the challenges of the teaching profession English language teacher education programs in Turkey were redesigned throughout the country. In the renewed program the ratio of the practical courses such as "school observation" and "school experience" were increased and courses which integrated theory with practice were included such as "Teaching English to Young Learners", "English Language Teaching Methodology" and "Teaching of Language Skills", and so on. The Approaches and Methods in Language Teaching Course is a course which has a theoretical base and suggests declarative knowledge. The effective acquisition of the theory behind this course has prominent importance since it aims to enable pre-service EL teachers to understand the nature of learning and teaching.

The WAT in the present study is a snapshot of students at the beginning of the second term. The Approaches and Methods in Language Teaching Course is a two-term course. The first term starts with Richards and Rogers' (1982) well-known three-level framework to describe various language teaching methods: approach, design and procedure. The preceding framework by Anthony, namely approach, method, and technique, is also studied. A review of history of language teaching methods follows starting with the Grammar Translation Method, designer methods and moving onwards to Communicative Language Teaching, Content-based Instruction and so on.

At the beginning of the second term, the researcher aimed to get a snapshot of the cognitive maps of the pre-service teachers about concepts studied in the first term as they would be the basis for further study in the second term. What pre-service EL teachers already know influences their further comprehension. It is a known fact that "topics about which we have considerable knowledge should elicit more associations than topics about which we have little or no knowledge" (Zakaluk, Samuels & Taylor, 1986). If the students don't have already existing cognitive structures they cannot associate the new concepts with those existing ones in their minds. Furthermore, if there are misconceptions in their already existing conceptual maps this will without doubt result in an inability to form accurate cognitive structures. Therefore, in order to help them form new and accurate cognitive structures the already existing ones first should first be checked. To this end, this study aims to investigate pre-service EL teachers' cognitive structures about some key concepts studied in the Approaches and Methods in Language Teaching Course.

1.3. Research questions

This study aims to find out answers to the following research questions:

1. What are pre-service EL teachers' cognitive structures about the concepts 'approach', 'design' and 'procedure'?

2. Are there any misconceptions of pre-service English language teachers about the concepts 'approach', 'design' and 'procedure' in their cognitive structures?

3. What are the implications for EL teacher education?

2. Method

The current study involves both qualitative and quantitative data. The data was gathered by a WAT. Three key words namely; approach, design, and procedure were selected as key concepts. They served as stimulus words. Students were given a sheet of paper on which the key concepts were written and were allocated a few minutes to list as many words as they could think of in association with the key word. Their responses were analyzed and recorded in frequency tables and cognitive maps that represent the cognitive structures of pre-service EL teachers were drawn accordingly. They were asked to use the key concepts in full meaningful sentences. These sentences were also investigated and categorized.

2.1. Sample / Participants

A total of 68 sophomores pre-service EL teachers participated into the study from two state universities in Turkey. The age of the students varies from 19 to 21 and only 18% of the participants were male students.

2.2. Instrument(s)

In order to investigate their cognitive structures related to some key concepts related to approaches and methods in language teaching, the pre-service teachers were given a Word Association Test (WAT). The WAT is a common tool to explore learners' cognitive structure, relationships between mental concepts, conceptual changes and misconceptions in learning (Bahar, Johnstone, & Sutcliffe, 1999; Hovardas & Korfiatis, 2006; Kurt et al., 2013; Özatlı & Bahar, 2010; Gussarsky & Gorodetsky, 1988; Shavelson, 1974).

The WAT presents words/ phrases as stimuli to the respondents to trigger associated concepts in their minds within a specific time (60 seconds in this study) so that the information network is uncovered (Gussarsky & Gorodetsky, 1990). The respondents are asked to write down as many as relevant concepts about a main concept. The frequency of the recalled concepts are then determined.

To contruct the WAT used in the present study, the lecturer of Approaches and Methods in Language Teaching course was asked to provide seven key words to act as stimuli. The words were selected because they were key concepts on which the course was based. The list was then evaluated by two faculty members giving the course and reduced to three concepts in terms of appropriateness. The key words in the study were Approach, Design and Procedure. As these terms formed the basis of the course and were related to other concepts in the course, their cognitive maps could illustrate the pre-service EL teachers learning.

The respondents were asked to write as many as ten words (if they could) that came to their minds in 60 seconds when they read the stimulus words. The key concepts were listed vertically to prevent sequential answering. To ensure reliability and validity of the findings, repetition of the key concept on each line would function as a stimulus each time and thus prevent students' own responses to be a trigger for the next associated word (Bahar ve Özatlı, 2003). Returning to the key word after each association would minimize the chaining effect (Bahar et al., 1999).

Finally, the respondents were asked to write a sentence about the key concept. The respondent-generated sentences would allow for deeper understanding regarding its accuracy or misconceptions. (Ercan ve Taşdere, 2010).

The stimulus word was presented in the following format in the test:

Figure 1. An example from the WAT, Respondent 18.
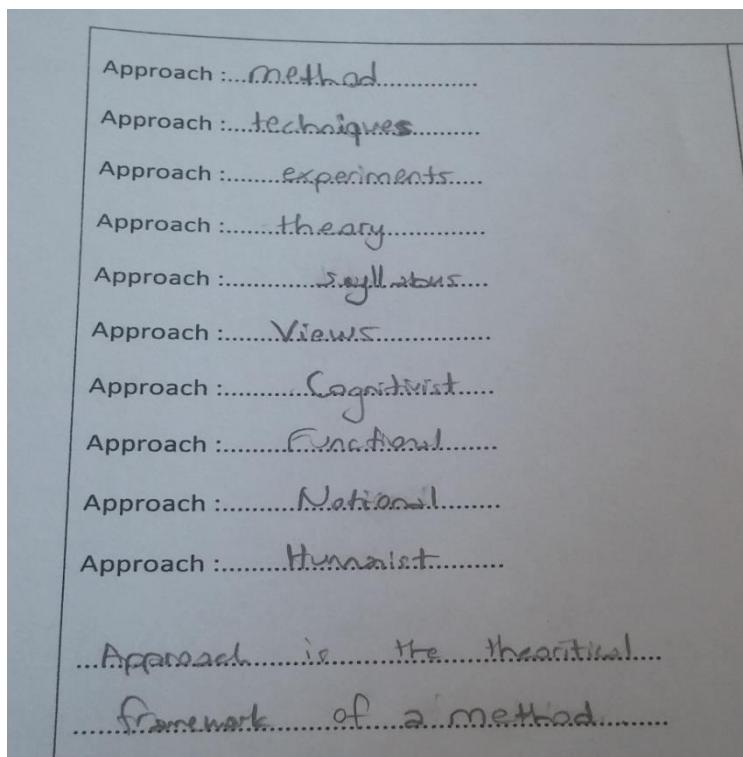
2.3. Data analysis

The participants were given 60 seconds for each word. The words or phrases provided by the participants were then subject to frequency distribution and content analysis. The coding was carried out by the researcher and two experts. Similar words were united under the same code, such as theoretical framework and framework. The researcher and the experts also coded the words as relevant and irrelevant in consensus. There were a total of 622 different words or phrases written as associated concepts by the participants. The words determined as irrelevant by the experts and the ones that were used only once were excluded during content analysis (64 words, 9.7%). The associated words provided by the participants were categorized in semantic relationship with their frequencies, which is accepted reliable results in WAT research (Kostova & Radoynovska, 2010).

The relevant words were listed and mind maps were created according to three cut off points (Bahar, Nartgün, Durmuş & Bıcak, 2008). Each were illustrated in the cells in Table 3. The recalled words by the respondents were presented in frequency tables. To illustrate the cognitive structures, cut off point technique developed by Bahar et al. (1999) was used. According to the technique, the highest frequency was determined (f 28). A lower frequency, then, was determined as a cut-off point (29-20). The concepts in the interval were illustrated as a cognitive map. Following that, in a stepwise fashion, the criterion was lowered to a frequency mention of 19-10 which yielded the map in Table 3. The procedure continued until the frequency dropped to three, at which level the lowest frequency

associated words were illustrated in the maps. Finally, all recalled concepts are covered in different frequency intervals.

3. Results and Discussion

The data collected through the WAT were categorized under three words. The subcategories and codes related with the key concepts were listed in tables below. Then mind-maps illustrating concept relationships were drawn.

Table 1. Number of associated words with the stimulus words

Stimulus Words	Total no of the associated words (codes)	Irrelevant no of words
Approach	186	31
Design	246	20
Procedure	190	13
	622	64

Table 1 suggests that the number of the associated words for the stimulus word approach were the lowest (n.186). The reason for this may be that 'Approach' is a theory-based term. It means that it suggests a theory of the nature of language learning. Pre-service EL teachers' difficulty in finding association words may emerge from the psycholinguistic and cognitive nature of the term. When we have a look at the total number of the associated words pre-service EL teachers wrote for the second stimulus word 'design', it is seen that it had the highest number (n.246). The reason may be that it involves items such as type of the syllabus, types of the learning and teaching activities, teacher roles, student roles, and the role of the materials that are used in the class. Pre-service EL teachers may feel that they can make use of them in their actual classroom performances and therefore may find more associated words for it. According to the data gathered, the number of the associated words pre-service EL teachers wrote for the third stimulus word 'procedure' were relatively higher (n.190) than those written for the first stimulus word 'approach'. The reason may be that it refers to the tactics and strategies based on a particular method. It may be too challenging for the pre-service EL teachers. The number of the irrelevant words for each stimulus word supports the idea that pre-service EL teachers found theory-related concepts more difficult than those which they could make use of in their actual class performances.

Table 2. Associations with the concepts "Approach", "Design" and "Procedure" and their frequencies.

Stimulus Word		
Approach	Design	Procedure
Codes (f)		
theoretical framework (28)	Grammar Translation Method (GTM) (25)	Language activities (22)
teaching (23)	Audio Lingual Method (ALM) (22)	drills (20)
design (21)	Communicative Language Teaching (CLT) (21)	skills work (20)
Chomsky (18)	Total Physical Response (TPR) (16)	role plays (13)
Behaviourism (17)	Direct Method (15)	games (12)
Principles (10)	How we teach (13)	practice (11)
procedure (9)	Silent Way (12)	materials (11)
method (9)	Community Language Learning (11)	question and answer (11)

Cognitivism (9)	Learning (10)	design (10)
syllabus (8)	Teaching (9)	technique (9)
views and ideas (8)	Desuggestopedia (9)	audio visuals (8)
technique (7)	procedure (9)	approach (7)
Constructivism (5)	materials (8)	ways to teach (7)
nature of language (4)	approach (7)	method (5)
nature of learning (4)	Procedure (7)	grouping (5)
Anthony (3)	Overall plan (7)	discussion (5)
Richards and Rodgers (3)	Syllabus (6)	teaching (5)
	Principles (5)	correction (4)
	Content-based (5)	learning (4)
	Teacher roles (5)	interaction (4)
	Learner roles (5)	warming up (4)
	Task-based (5)	syllabus (4)
	Practice (4)	tasks (4)
	Content (4)	comprehension check (3)
	Theory (3)	fill in the blanks (3)
	Behaviourism (3)	

Table 2 displays the frequency of the associated words given by the pre-service EL teachers for each of the stimulus words. Based on the data, it has been recognized that there were many blank answers, sometimes as many as half of the answers were not responded by the pre-service EL teachers. Moreover, words which had direct associations to the stimulus words were given in low frequency such as syllabus, teacher roles, learners' roles, content, materials, etc. for the stimulus word 'design'.

Table 3. Cognitive structure illustrated as maps

Cut-off point	Map
30-20	
19-10	
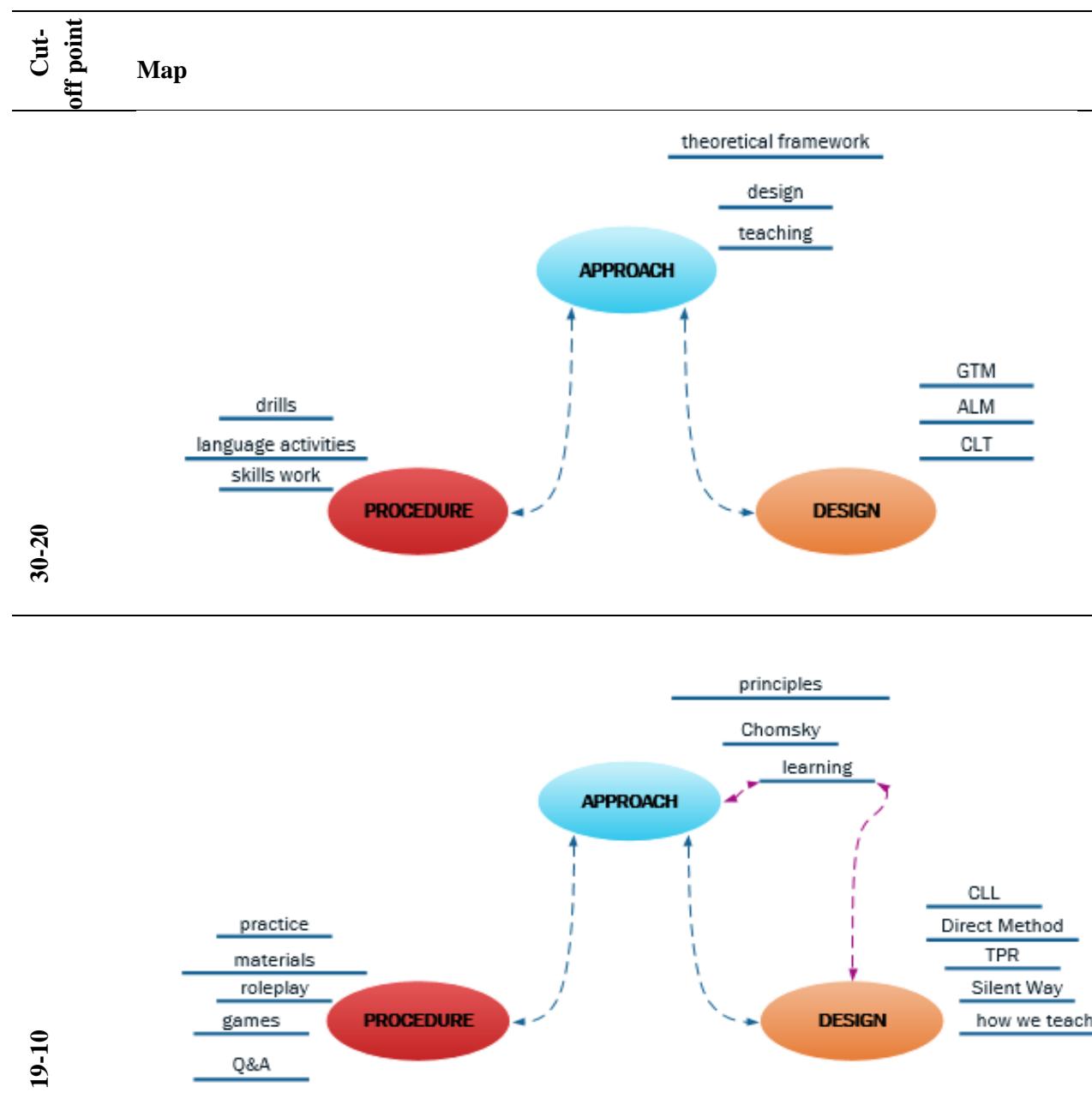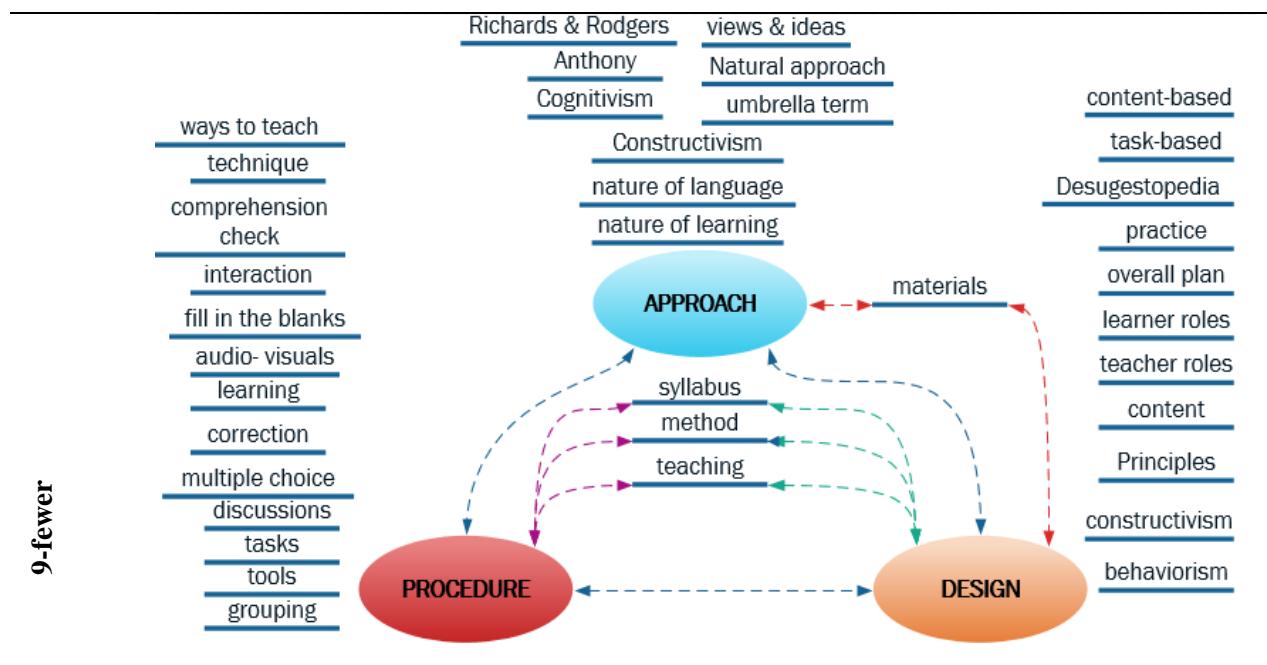
It appears that pre-service EL teachers associated very few concepts in the highest frequency interval (30-20 cut-off point). *Approach* was associated with *design* and *teaching* and *theoretical framework* as a key concept in its definition was provided. Design was most frequently associated with *Communicative Language Learning*, *Grammar Translation Method* and *Audio Lingual Method*. Though CLT is still favored, GTM and the ALM are not welcome in language classrooms today. What is more, GTM reflects the traditional language teaching practice before the methods have been founded on a sound theory of language and learning. In that sense, GTM is not a method or design that is derived from an approach. There appears to be a misconception about what a design or method is. This might result from prevailing GTM-like practices in many language classes, which most pre-service EL teachers were familiar with. As to the procedures, the most frequently recalled concepts were, drills, language activities and skills work as the actual implementations in the classroom. It is interesting that drills, though is not favored as it has its roots in Behaviorism, were among the most frequently recalled classroom procedures. The reason might be that it was actually a commonly practices classroom technique in pre-service EL teachers language learning experiences.

The second cell in Table 3 illustrates associated words with the stimulus word in the 19-10 mention interval. Approach was associated with principles of learning, which can be regarded as accurate knowledge. However, a direct association between approach and Chomsky, though a fundamental and important figure, appears to be a forced one. The second stimulus word, design, was associated with other methods covered in the course, namely CLL, TPR, Direct Method and Silent Way. Also, the pre-service EL teachers associated the word with *how we teach*. In the broadest sense, this might involve presentation and practice of language in line with the given approach; and thus can be accounted as acceptable. The procedures provided by the pre-service EL teachers were materials, practice, roleplays, games and question and answer exchanges; which are all related to the implementation phase.

The last map illustrates the lowest frequency associations with the stimulus words. All three words were associated with syllabus, method and teaching. The nature of language and nature of learning were mentioned as key concepts related to approach. As scholars to define the stimulus word, Richards and Rodgers and Anthony were also recalled by pre-service EL teachers. The fact that approach is broader in scope and is related to views and ideas, somehow theory, of learning might also

be counted as accurate associations. The procedures were associated with ways to teach and a large list of classroom practices such as audiovisuals, discussions, grouping, correction, tasks and so on. It appears that pre-service teachers were more successful to recall actual classroom techniques.

Table 4. Sentences generated by Respondents

Stimulus word	Informative sentences with factual knowledge	Sentences with no factual knowledge or superficial knowledge	Sentences with misconception	No sentence provided
Approach	23	17	10	10
Design	24	28	3	6
Procedure	25	25	4	11
Total	72	70	17	27

The frequencies of sentences generated by the pre-service EL teachers show that most of them were able to provide informative sentences with accurate factual information about the stimulus words (n.72). Some sample sentences from the respondents were as follows: *"An approach is the theoretical framework and foundation of a method"; "Design is the overall plan for the course including the syllabus and content."; "Design is like a method - the practical realization of an approach"* and *"Technique is the specific strategy that is used in the classroom"*. However, there were nearly as many uninformative sentences as the former group. The pre-service EL teachers provided sentences that displayed either no factual knowledge or very superficial knowledge (n. 70). The examples below show that some pre-service teachers failed to comprehend and express the stimulus words: *"Design is used for effective learning of students"; "Teachers should use the appropriate techniques for the students"; "Different types of techniques facilitate to teach language in different ways"*.

As to misconceptions of pre-service EL teachers, quite a number of sentences (n. 17) plainly involved inaccurate information such as *"Approach is the word for the aim to teach and learn"; "Approach is the way of teaching chosen by the teacher"; "An approach is outline or plan of what to teach"; "Technique is way of giving information"; "Approach is our manner towards our students"*. Failing to fully understand and reason the basic three concepts in the course *Approaches and Methods in Language Teaching*, the pre-service EL teachers might not benefit from the course. The number of empty responses for generating sentences was 27 for the three stimulus words, which unfortunately is an indicator that the pre-service EL teachers might fail to obtain the learning objectives of the course.

4. Conclusions

In this study it was aimed to investigate pre-service EL teachers' cognitive structures about some key concepts in Approaches and Methods in Language Teaching Course via a Word Association Test (WAT). Based on the results gathered from the study it turned out that WAT as an alternative assessment instrument, which is generally used in the area of science education, might also be used and present valuable insights in the area of pre-service English language teacher education.

The first research question was related to the identification of the pre-service EL teachers' cognitive structures about the concepts 'approach', 'design' and 'procedure'. When the responses of the pre-service EL teachers were analyzed, it was recognized that they could not associate many words for these stimulus concepts and found it the most difficult for the stimulus word 'approach' probably because of its theoretical nature. Another equally important finding was that the frequency of the words which had direct associations to the stimulus concepts was not high. This finding suggests that

the cognitive structures of the pre-service EL teachers about the key concepts; 'approach', 'design' and 'procedure' were not sufficient.

On the other hand, as for the second research question, many misconceptions were detected in the cognitive structures of pre-service EL teachers' responses. The data was gathered in two ways. First pre-service EL teachers' word associations were analyzed and the relevancy of the associated words was found as low and second, pre-service EL teachers were asked to use those stimulus words in meaningful sentences and the results again suggested that quite a number of the respondents had nonfactual and inaccurate information and misconceptions related to the stimulus words.

The third research question looks for its implications for the EL teacher education. When we think that Approaches and Methods in Language Teaching Course is a two-term course, it is crystal clear that the theoretical knowledge and the concepts will complement each other. The results suggested that there were some vital problems, inadequacies and misconceptions in the cognitive structures of the pre-service EL teachers in terms of these three basic key terms, which will in turn make further concepts incomprehensible for the pre-service EL teachers. Another vital implication of the study might be the use of WATs as effective alternative assessment tools rather than traditional assessment means such as multiple-choice tests.

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Hizmet Öncesi İngilizce Öğretmenlerinin Dil Öğretiminde Yöntemler ve Yaklaşımlar Dersindeki Bazı Anahtar Kavramlar hakkındaki Bilişsel Yapılarının Kelime İlişkilendirme Testi ile İncelenmesi

Öz

Bu çalışma hizmet öncesi İngilizce Öğretmenlerinin öğrenme süreçlerini ve kavram yanılgılarını belirlemek için Dil Öğretiminde Yaklaşımlar ve Yöntemler dersi ile ilgili üç önemli kavram ile ilgili bilişsel yapılarını ortaya çıkarmayı hedeflemektedir. Çalışma hem niteliksel hem niceliksel veri içermektedir. Araştırmacı bir Kelime ilişkilendirme Testini (KİT) Türkiye'deki iki devlet Üniversitesinde Eğitim Fakültesinde okuyan 68 ikinci sınıf hizmet öncesi İngilizce Öğretmenliği Bölümü öğrencisine uygulamıştır. Veriler anahtar kavramlardan elde edilmiştir ve ilişkili kelimeler sıklık tablolarına kaydedilmiştir. Hizmet öncesi İngilizce Öğretmenlerinin bilişsel yapılarını gösteren kavram haritaları çizilmiştir. Hizmet öncesi İngilizce Öğretmenleri tarafından anahtar kavramlarla ilgili yazılan cümleler analiz edilmiş ve sınıflandırılmıştır. Bulgular Hizmet öncesi İngilizce Öğretmenlerinin anahtar kavramları etkili bir şekilde öğrenemediklerini göstermektedir. Hem kavram haritalarında hem de kurulan cümlelerde anahtar kavramlarla ilgili bazı kavram yanılgıları tespit edilmiştir. Sonuçlar Kelime İlişkilendirme Testlerinin öğrenmede derinlemesine değerlendirme yapmak için alternatif bir değerlendirme yöntemi olarak kullanılabileceğini ortaya koymaktadır.

Anahtar sözcükler: Kelime ilişkilendirme testi, hizmet öncesi İngilizce öğretmenleri, kavram haritaları, dil öğretiminde yaklaşımlar ve yöntemler

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