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CONTENTS

STRESS IN ENGLISH LANGUAGE LEARNING

CHAPTER 1

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1. INTRODUCTION

Stress puts us "on the spot". Like motivation and emotion, stress arouses us and influences our behavior. Although it may be the last thing that we need, we often experience strong emotional reactions in situations that pose challenges, demands and threats (Smith and Sarason, 1986:484). Selye (1936) defined stress as "the nonspecific response of the body to any demand made on it" (p. 36, cited by Rice, 2000). The term "stress" is borrowed from the discipline of physics and it actually means pressure (Kaur, 2016). People are stressful because of many things ranging from going to the dentist to walking down a street at night to thinking about dying. The most common causes of stress involve not threat to a person's health or physical well-being but difficult social situations.

Unfortunately, stress is a common part of life in the late twentieth century-something few that any of us can avoid. Partly for this reason and partly because stress seems to exert negative effects upon both physical health and psychological well-being (Baron, 1989:320). Especially stress has negative effects in classroom environment because of various reasons in learning a foreign language such as students' low English proficiency, fear of mistakes and derision, teachers' intolerance of silence, etc..

The purpose of this study, as such, is to describe how stress effects English language learning negatively and prove the failure in learning a second language because of stress. As an affective filter, stress affects English language learning in a negative way.

In this study, the situational, personal and biological factors in stress has been reviewed. Then, stress in school environment and the causes of stress in learning a foreign language has been introduced. After all the study has been

summarized with conclusions and discussions and some inferences has been presented.

1. Factors Involved in Stress

Stress is one of the areas in which the interaction between situational, personal and biological factors can be most clearly seen (Travers and Cooper, 1996). "The experience of grief and troubled relationships are probably the major causes of stress in our lives. But there are other factors which can bear down on us so hard we feel ourselves failing to cope" (Dalton and Dunnet, 1992:84). Stress may be external or internal that may be caused by the environmental factors or perceptions of the individual (Shahsavarani, Abadi and Kalkhoran, 2015).

1.1. Situational Factors

Situational factors also influence the stress and coping process and are defined as 'related to the immediate nature of the stressful transaction, which was the specific focus of the individual's coping attempts (Parkes, 1986 cited in Kerdijk, Kamp and Polman, 2016; Kaur, 2016). The nature of the stressful situation affects our adjustment. Duration, severity, predictability, controllability and suddenness of onset are the factors that situational variation include.

1.2. Personal Factors

According to Smith and Sarason (1986), when people experience an imbalance between a situational challenge and their personal resources and do not know what to do about it, stress and anxiety develops (p.485) or other negative emotions and feelings such as press, pain, sadness, etc., and result in serious psychological disorders such as post-traumatic stress disorder (PTSD) (Shahsavarani, Abadi and Kalkhoran, 2015). High anxiety is not conducive to rational planning and effective action, and so the plans of

anxious people may not be effective. Not only does stress contribute to failure, but failure lays the groundwork for more anxiety and future failure. Also a lack of self-confidence can result in reduced personal effectiveness. Leary (1996) has stated that people often become nervous when they talk to people in positions of authority (a boss or a teacher, for example), deal with potential romantic partners, go to parties where they don't know many people, or give speeches in front of a large audiences (p.180).

1.3. Biological Aspects of Stress

A certain amount of stress can spur you on, but if the body is subjected to stress for long periods of time, this can seriously affect your health (Viner, 1999; Epel et al, 2018). The effects of stress are many: for example, insomnia, exhaustion, lack of concentration. Smith and Sarason (1986) has argued that bodily stress reactions follow a three-stage general adaptation syndrome (GAS). The first stage is an alarm reaction, which involves physiological changes generally associated, with emotion: pupil dilation, heart rate increase, increase in galvanic skin response, and increase in epinephrine secretion. Second stage is resistance and the third stage is exhaustion. At this point, the adrenal glands can no longer function adequately, and the body begins to break down (p. 486). In response to stressors (overwork, an argument with a spouse, a death in the family), chemical messages are carried along neuronal tracks in the outer edge of the brain to the hypothalamus, which produces a substance called corticotrophin releasing factor (CRF).

2. Stress in School Environment

As with most situations in life, the majority of children manage their period of time at school, learning as they go, expanding their construing of things and creating themselves with greater or lesser degree of success. For a mi-

nority, however, it may be a time of extreme stress. Apart from the difficulties in relating to their peers touched on earlier, some never come to terms with their teachers, final learning either irksome or traumatic and leave school with bitter memories and some damage to their growing sense of their own value. According to Dacey and Fiore (2002), children and adolescents with generalized anxiety disorder (GAD) have excessive and unrealistic worry in a variety of situations. They may spend more time than is appropriate paying attention to the details of such activities as homework or other normal tasks. Children with GAD may also experience any of the following physical symptoms: Restlessness, tiredness, difficulty concentrating, irritability, unusual muscle tension, sleep disturbance" (p.26).

Stress is an acknowledged feature of language learning, whether as cause, effect, or both. But why should stress be a special problem for language learners? Certainly some school children spend a great deal of their time anxious about most of their school subjects, and learners report that one of their major worries is that when forced to use the language they are learning, they constantly feel that they are representing themselves badly, showing only some of their real personality, only some of their real intelligence (Allwright and Bailey, 1994:173). Therefore, an important condition for successful language learning is the absence of stress. Asher (1972) proposed that first language acquisition takes place in a stress-free environment, whereas the adult language learning environment often causes considerable stress and anxiety. The key to stress-free learning is to tap into the natural bio-program for language development and thus to recapture the relaxed and pleasurable experiences that accompany first language learning. On the other hand, for many second language learners, the formal classroom environment is a major stress and anxiety because it demands students to be more correct and clearer in using the target language (Hashemi, 2011). By focusing

on meaning interpreted through movement, rather than on language forms studied in the abstract, the learner is said to be liberated from self-conscious and stressful situations and is able to devote full energy to learning (Richards and Rodgers, 2001:75). As Asher (1969) stated, it is important that there not be too much modeling, but that students not to be too rushed either, feelings of success and low stress facilitate learning.

3. The Causes of Stress in Learning a Foreign Language

There are some problems that students have while learning a foreign language and these problems cause reticence and stress in class.

Getting students to respond in the classroom is a problem that most ESL teachers face. In ESL classrooms students are stressful when learning a second language because of some reasons as follows (Bailey and Nunan, 1991):

> Interviewer: What stops you from speaking up?
>
> ESL Student: 'Cos my classmates also not speak up…they affect me very much. Sometimes I really frighten…I am afraid my classmate will laugh… I think my English level is not good, so I am shy to talk English…I hate my English very much because many people if fail in English… it affects their life (p.145)

Experiencing linguistic difficulties in foreign language learning causes stress among language learners. As mentioned in the speech of ESL student, the social and cultural environment in which language learning takes place can lead to stress, too (Scovel, 1991:21). The reasons of stress in foreign language learning is mentioned below in short.

3.1. Students' Low English Proficiency

Most teachers attributed student reticence and stress to low English proficiency. In some classes students' language proficiency is not good enough to express their ideas clearly in English during group discussion. Not responding to teacher's question was a result less from lack of knowledge but more of the insufficient English frequency. In Trylong (1987) and MacIntyre and Gardner (1995) studies, it is indicated that there is a negative relationship between language proficiency and anxiety. On the other hand, according to the study by Allwright and Bailey (1994), students' level of self-confidence and their willingness to take risks are important factors that affect their readiness to respond.

3.2. Students' Fear of Mistakes

The second reason that commonly occurs is students' lack of confidence and fear of making mistakes and being laughed at. Bailey and Nunan (1996) has stated in their study that students are unwilling to speak in English for fear that they may make silly mistakes in front of the brighter students (p.150). Because of that, students produce stress and cannot learn the language effectively. This may because of low level of self-efficacy as Bandura (1997) maintained in his study. Robby (2010) states that the fear of mistakes of students in English classes is the main factor in students' reluctance to speak.

3.3. Teachers' Intolerance of Silence

Many teachers themselves dislike or are afraid of silence and they feel uneasy or impatient when they fail to get a response from students. Therefore, according to a research by Milner and Palmer (1998), when a response is not forthcoming, teachers do one of the following, allocate the turn to turn to another student, provide the answer

themselves, or repeat, or modify the question (p.83). Also these uneven allocation of turns and giving no wait time and putting a great deal of pressure on students create a great deal of stress in classroom.

3.4. Text Anxiety

Test anxiety is related to mainly students' fear of being tested (Juhana, 2012). Students' text anxiety stems from fear of failure, which is closely related to fear of negative evaluation. Especially evaluation in front of the whole class makes students stressful and fail in oral exams. According to a study by Aydın (2019), text anxiety affects academic outcomes of students and it differs according to gender differences. Especially gender differences were found to be significant in overall test anxiety favoring females in elementary schools.

3.5. Fear of Negative Evaluation

A review of the literature illustrates that mostly students feel stress when they perform oral tasks and social evaluation in this respect (Cutrone, 2009). Therefore, formal classroom environment causes more stress as students fear of negative evaluation. Students generally are afraid of making mistakes because they are anxious about being laughed at and receiving negative evaluations from their peers and teachers in case of making mistakes in speaking English (He and Chan, 2010 cited in Juhana, 2012).

3.6. Incomprehensible Input

Another source of stress is incomprehensible input. Counselors at the Learning Skills Center at the university of Texas found that stress primarily resolves around speaking and listening. Many had little or no idea of what the teacher was saying during their utterances (Allwright and Bailey, 1994). Studies on language learning stress re-

veal that stressful students are desperately trying to avoid humiliation, embarrassment, and criticism and to preserve their self-esteem. Teachers, therefore, must acknowledge this stress and appreciate the extent to which teachers' behavior can exacerbate it. Otherwise, whatever strategies the teacher adopts to overcome the problem are doomed to failure.

3.7. Lack of Motivation

In foreign language learning, students' efficiency in language learning is influenced by the types of intrinsic and extrinsic motivation. While external motivation is acquired as a result of external rewarding and encouragement, intrinsic motivation develops naturally, spontaneously, and in intrinsic motivation, the learning activities itself are a reward for the student. In other words, the individual's participation in these activities without the expectation of reward in the learning environment with the desire and power from within Students who have low motivation to learn foreign languages are generally not able to focus more on courses, do not make regular efforts on language learning and give up efforts to learn difficult issues, while students who have been motivated enough to learn foreign languages, focus on courses, make preparations, communicate, participate in activities, and show persistence to difficulties (Ciftpınar, 2019). Acat and Demiral, (2002) adds that teachers' role in enabling motivation is very significant in language learning. Uninspired teaching, monotonous teaching, lack of perceived relevance of materials and lack of knowledge about the goals of lesson or language learning reduces motivation of students as they feel boredom in learning L2 (Juhana, 2012).

4. CONCLUSION, DISCUSSION AND RECOMMENDATIONS

From the social psychological perspective, learning a second language means the acquisition of near-native facility with the content and structure of the language and near-atomicity in its use both conceptually and behaviorally. This takes time and dedicated effort for a learner. Thus, when we speak of stress while learning a second language, we should consider the psychological and physical effects of it. According to Baron (1989), the biological and personal factors help explain why stress may interfere with many types of performance, even when present at fairly moderate levels. In many situations, stress can indeed interfere with task performance.

The environment in the classroom should be free from stress to achieve success in second language learning. Because of various reasons such of fear of mistakes, derision, low English proficiency, etc., students are affected negatively.

The aim of lesson is not just entertainment or laugh. The pupils should learn the target language without being aware of it. They have to think and react quickly, which is not easy. In a very few minutes they have to select what is important to include and to discard what is not. They have to concentrate on the vocabulary, grammar, etc. and they should do it without tension of fear. Therefore, the teachers' attitude towards and beliefs about language learning and teaching, their reaction to the learners' errors, and the way they create stressful environment in the class have been reported to cause significantly stress in second/foreign language learning (Tanveer, 2007). Instead teaching language with games and being relaxed would work better. Positive attitudes towards errors in language classes can encourage students (Hsu, 2001) and telling students that making mistakes is an inevitable part of language learning (Chang, 2011). Learning through games is spontaneous

and natural. Therefore, students in ESL classes should be avoided from stress to be able to use their mental abilities effectively. The lower the stress is, the greater the learning a second language occurs**.**

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USE OF CONVENTIONALLY INDIRECT STRATEGIES IN REQUESTS BY TURKISH EFL LEARNERS

CHAPTER 2

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INTRODUCTION

Over the last three decades, the literature on L2 pragmatics has presented many studies on both pragmatic competence and how to improve pragmatic competence in EFL contexts (Taguchi 2011 and 2015). Taguchi (2015) described pragmatic competence as follows: "Pragmat-ic competence refers to one's knowledge of linguistics, norms and social conventions, and one's ability to use these knowledge bases in a socially-bound interaction." (p.1).

Traditional language teaching is generally based on grammar-focused instruction. That is, it mainly focuses on on-forms, which is more systematic. Presenting language in this way seems more accessible for learners because most of the time there is a one-to-one correspondence between rules and forms. However, knowledge of pragmatics involves functions of language. Taguchi (2015) explained why learners have to deal with many difficulties when learning to use features of pragmatics:

In order to learn pragmatics, learners must attend to multi-part mappings of form, meaning, function, force and context. These form-function-context mappings are not only intricate but also variable and do not obey systematics, one-to-one correspondence.

Moreover, features of pragmatics are shaped up by norms and conventions of social practices. All these challenges foreign language learners immensely. Learners gain pragmatic competence in the process of their native language acquisition. Therefore, they are competent users of features of pragmatics in their native language. However, whom learners need to use the same language features in the language, they learn that they should be able to make conscious decisions about the extent to which they can make use of their existing knowledge. They need their

awareness raised as to when their pre-existing pragmatic knowledge differs from that of the target language.

Pragmatic ability is one of 'the most complex and challenging aspect of communicative competence'' not only for learners to but also for teachers to teach (Ishihara & Cohen 2010, 76). There are several reasons for this. One of them is that language teaching is mostly based on the teaching of grammar rules. The teaching of the use of pragmatic features of language has been neglected not only in Turkish foreign language teaching context (Kara-tepe 1998, Karatepe 2003, Karatepe 2004, Ünal 2004) but also in other countries such as Norway (Brubaek 2012), China (Hu 2014), and Algeria (Segueni 2014).

Another difficulty is that users of language do not always express what they mean openly. They tend to imply meaning, which can pose a problem for language learners as they focus on grammar rules, mostly ignoring changing meaning depending on the context. For example, Turkish speakers tend to ask the time by asking whether the listener has got a watch or not as in 'Have you got a watch?' (in Turkish 'Saatiniz var mı?'). On the surface it querries ownership of a watch. This is referred to as 'locutionary force of a speech act' (Yule 1999). In reality, it is a request and asks the listener to tell the time which is called 'illocutionary force' (Yule 1999). Of course, an NS of Turkish can interpret this and tells the time. The interpretation is referred to as 'perlocutionary force' (Yule 1999). If the listener decides to tease the speaker, she may say 'Yes, I have.'. Then, the speaker will have to ask specifically 'What is the time?'. Although this kind of incidence can be exploited in a comedy or commercials (Karatepe 2003), it is not unlikely that learners of a language can experience such farcical situations in real life. There are several examples of awkward situations mentioned in Ishihara & Cohen (2010).

For example, Karatepe (2016) investigated requests in informal complaint letters by Turkish EFL teacher trainees by comparing their performance with that of native speakers of English (NSs). She found that teacher trainees failed to asses the influence of contextual factors on the trainees' linguistic choice. They tend to use direct form imperative and attempted to soften it with a, 'please'. Majority of them tended to hedge their request by using the modal 'Can' in yes-no question form. On the other hand, NSs of English did not choose the imperative in their requests. They tended to use syntactic downgraders such as 'I was wondering if...' and conditionals and the interrogative with a modal verb.

Politeness Theory and Face Concept

The concept of 'face' was first suggested by the sociologist Goffman (1967) who described it as 'a social commodity'. It can also be described as 'the public self-image' (p. 66). It can be lost organized and saved. According to Goffman, we do our best to protect our face in daily interaction.

Equally, we expect others to respect our face. Brown and Levinson (1987) described face having two aspects. The positive face reflects our desire to be accepted by society and respected by others. In order to do this, we try to be generous, helpful and accommodating. On the other hand, negative face reflects our desire to be independent. We would not like others to interfere with our lives, and we would like others not to impose themselves on us Brown and Levinson (1987, p. 67).

However, speech acts can be face-threatening by their nature. For example, when we request from someone, depending on the degree of inconvenience our request causes, we, in a way, impose ourselves on the other person to a degree. This behaviour threatens our face because of the

other person may say 'no'. Even s/he agrees to do what we want him/ her to do, s/he may be led to have a negative impression about us. Therefore, making a request is always a risky business.

For this reason, consciously or subconsciously, we need to be careful when verbalising our wish. We make decisions based on some socio-cultural norms and rules. Some of these are ingrained in us by society. These are sociological variables that everyone expects us to consider in interaction.

When we perform a face-saving act or face-threatening act, three important sociological variables come in to play. These are related to the 'weight of the act' which has got three interrelated factors, namely 'power, distance and rank'. 'Power' is related to the power dynamics between the participants. Here, we are not only talking about superior-subordinate power relationship and relationships between different social classes, but also power dynamics between family members, which are usually defined by traditions and cultural environment.

'Rank' refers to the social ranking of the topic of the conversation. Specific topics are more sensitive in certain situations. For example, specific topics are taboo in some countries or talking about some topics clearly is not appropriate, both socially and culturally. In some countries, health matters are not supposed to be discussed openly in public (Brown and Levinson 1987).

'Distance' is both a physical and psychological distance between individuals. We change the way we speak, depending on how close we are with our interactant. We make decisions on how we interact by taking these factors into account in particular situations (Brown and Levisnon 1987).

This lack of attention to raising learners' competence in the use of pragmalinguistic elements of language is not only limited to English language teaching context. That is, Polat (2015) found that although teachers teaching French as a foreign language and Turkish as a foreign language in Turkey were aware of the importance of developing learners' pragmatic competence, they did not seem to have satisfying field knowledge to teach these topics, as a consequence of which they did not feel confident to teach them. Karatepe (2001 and 2016) also reported similar findings.

Li and Jian (2019) carried out a study on requests performed by Australian learners of Chinese as a foreign language. Their study reported development in learners' pragmalinguistic abilities as their general Chinese proficiency level increased in time. They compared learners' performance with the Chinese speakers' performance. They found that native speakers chose to make requests by taking social variables such as power social distance and rank of imposition into account. However, learners failed to consider the effect of these variables.

Interestingly, Li and Jiang (2019) also reported that the development of pragmalinguistic competence of learners was faster than their sociopragmatic competence was. The possible reason for this could be that it might have improved with the learners' increasing general linguistic competence. That is, it appears that teaching a foreign language requires a specific focus on learners' sociopragmatic competence as well as pragmalinguistic competence.

The present study investigates the use of politeness strategies by using different levels of indirectness. This kind of research entails the researcher to focus on head acts in a request. Blum-Kulka *et al.* (1989) defined ahead act as follows: 'the minimal unit which can realise a request' (p. 275). The study also follows Billmeeyer and Vargehese's

(2000) description of directness, which is based on Brown and Levinson's (1987) classification of head act strategies. These are:

1. Direct strategies (D), where the speaker's intent is apparent from the locution. This transparency is derivable from the grammatical mood (imperative), the use of performative verbs, or semantic content of the utterance, such as:

Please turn the music down.

2. Conventionally indirect strategies (C), where the interpretation is aided by conventional usage, such as (a) a suggestory formula or (b) reference to a preparatory condition, as in:

How about turning the music down?

Could you turn the music down, please?

3. Non-conventionally indirect strategies (N), which includes strong or mild hints, such as:

It is very noisy so late in the evening. (Billmyer and Varghese 2000, 524-525)

Following Blum-Kulka et al. (1989), the study will also look at internal modification in the headact. The internal modification can be done by using syntactic and lexical or phrasal elements which are used in order to soften or increase the imposition of the request. Among these are Lexical downgraders, include politeness markers (please), consultative devices (do you think), understaters or hedges (Could you do your paper a bit earlier?). Syntactic down graders include the use of tense and aspect (I was wondering if ...), conditional clauses, and the use of the interrogative. (Billmyer and Varghese, 2000, 525. Similarly, an external modification strategy is also vital for any request.

Based on Blum-Kulka et al. (1989), Billmyer and Varghese (2000) described elements used for external modification of the head act briefly.

On the other hand, external modification strategies are used in 'supportive moves'. The aim is to prepare the hearer a head of the request. These are offering reasons and explanations for the request. They are also referred to as 'supportive mitigating moves' (Billmyer and Varghese 2000: 525). Supportive moves were further divided into sub-groups according to the mitigation type they express. *Preparator* (Can I ask a question?), *getting a pre-commitment* (Could you do me a favour?), *disarmer* (I'll give your notes right back), *grounder* (I had trouble with the data collection), *imposition minimiser* (If you have a few minutes, can I talk with you?), and *promise of a reward* (You can borrow my notes anytime). Besides, *alerters* are used to signal the hearer an upcoming request. They include names and address terms and attention getter 'Excuse me.' (Blum-Kulka et al. 1989; Bilmyer and Varghese 2000: 525; Hassal 2001).

The study will also look at the internal modification of head act. An internal modification strategy can be performed by using syntactic and lexical or phrasal elements. These are used in order to soften or increase the imposition of the request. Lexical modifiers can be politeness markers, such as 'please', consultative devices such as 'Do you think?', hedges and minimisers such as 'a bit' and 'sort of', syntactic down graders can be tense and aspect 'I was wondering if , conditional clauses and the use of interrogative.

Research Questions:

1. To what extent can Turkish ELT teacher trainees use appropriate forms in both Turkish and English

to make requests by considering the politeness variable Power (Brown and Levinson 1987)?

2. Which politeness strategies the trainees tended to use?

The Study

The study was based on two sets of data. It was collected by administering a Discourse CompletionTasks (DCT) both in Turkish and English. Informants were 90 first-year students. They first did the Turkish version, and the following week they did the English version of the same test.

The DCT consisted of 3 different situations designed to elicit requests. These situations aimed to simulate natural contexts that students may probably experience in daily life, such as borrowing lecture notes from a friend. The informants completed the test in 20-25 minutes.

There has been a debate on questioning the suitability of DCT as a data collection tool. Taguchi (2015) claimed that DCT "was judged to be appropriate because this study focused on participants' pragmatic knowledge, namely their understanding of contextual factors (socio-pragmatic knowledge) and their knowledge of requests expressions that would be appropriate in the context (pragmalinguistic knowledge) rather than their performance (i.e. ability to perform pragmatic acts in authentic interactions)" (pp. 663-664). That is, the data elicited using DCT is a sample of language use which provides the researcher with information about informants' level of knowledge on the role of contextual factors and appropriate language choices in a given situation. In the same vein, Cohen and Shively (2007) described their written DCT as "an indirect means for assessing spoken language in the form of a written pro-duction measure" (p. 196). Bardovi-Harlig (2018)

commented on this description by saying that "That is perhaps the best description to date."

Data Analysis

Power (P) as a variable in Politeness Strategy

Power was evaluated according to the relationship between interlocutors.

+P represents informant's authority over the other person whom s/he is supposed to interact.

-P refers to the other person's authority over the informant and

=P indicates that speaker and hearer are at equal status.

First, the strategy type the informants preferred was determined in every situation. The performances were counted and converted into percentages. There are many grammar and spelling mistakes in students' responses. We kept them as they were.

Situation 1 (+P)

Imagine that it was the time for final exams. You have an exam every day. You study hard and do not sleep much. After an exam, you come home tired and decide to take a nap. But your neighbour's noisy children won't let you go to sleep. How do you ask them to be quiet?

Table 1: *Analysis of* **+P situation** *in Turkish and English.*

	+PowerSituation 1				Total
Groups	D	CI	NCA	A	
English Data	40	53.4	0	6.6	100
Turkish Data	17.9	73.3	1.1	7.7	100

When we consider the percentages of +P where the speaker has authority over the hearer, it is clear that the most prefered strategy is Conventionally Indirect. It is followed by Direct strategy, and the least prefered one is

Non-conventionally indirect. It is important to note that some of the informants prefered Avoidance strategy.

Example 1(T):

Yarın sınavım var cocuklar uyumaya çalışıyorum, biraz sesiz olun. (Children, I have got an exam tomorrow. I am trying to get some sleep, be quiet.)

With an imperative verb, this direct request asks noisy children to be quiet.

Example 2 (T):

Çocuklar, ya sessiz oynayın ya da dışarıda oynayın çünkü yarın önemli bir sınavım var. Sessiz olursanız biraz dinlenmeyi düşünüyorum öncelikle. (Kids either play quietly or go out to play because I have got an exam tomorrow. If you be quiet, the first thing I am thinking of is having a little rest.)

Example 3 (E)

Why are you making so much noise? I am trying to study for my exam! Please be more quiet!

In this example, the verb of the head act 'be' is a mood derivable (Blum -Kulka 1989) one which shows that request is a direct one. I would like to draw you attention to the high level of direct strategy choice. While Non-conventional indirect strategy is the least prefered one, a considerable number of students preferred *Avoidance strategy*.

Table 2: *Analysis of the frequently used verbs used in* **+Psitua-tion** *in Turkish and English.*

Verbs	Sessiz olmak	Avoid	Other Verbs
	(to be quiet)		
Turkish data	84.6 %	7.7 %	7.7 %
English data	87.7 %	0	12.3 %

The main verb used both English and Turkish is 'be quiet'. Students used less number of verbs in Turkish. Besides, they did not use Avoidance strategy in English. It can be due to the influence of classroom instruction. Fearch and Kasper (1989) also reported a similar effect. Students are always instructed to answer any question and react to any given situation in the English lessons.

Table 3: *Analysis of* **=P situation** *in Turkish and English.*

	=Power Situation 2				Total
Groups	D	CI	NCA	A	
English Data	6.6	93.4	0	0	100
Turkish	3.3	96.7	0	0	100

In Power equal situation, informants acted almost in unison and chose to use Conventionally Indirect Strategy. No avoidance strategy this time. When we consider the imposition of this request on the other person, it is enormous. In the world of students, this is a very sensitive issue.

Example 3 (E)

You know, I haven't take the XX lesson for 4 weeks. And,I don't have the notes. I know you need them. But, could you give them to me? I'll photocopy them and give back to you immediately. Please believe me.

In this example, the head act contains a modal verb 'could'. Plus, the verb 'give' was used instead of 'lend' although it was given in the situation described.

Table 4: *Analysis of the frequently used verbs used in* **=P situa-tion** *in Turkish.*

Verbs in Turkish	Frequency %
Almak (take)	37.9
Vermek (give)	35.5
Ödünç almak/ ödünç vermek	15.5
(borrow / lend)	
Others	11.1
Total	100

Informants tended to use 'almak/ vermek' (take/ give) most frequently. However, this is not likely to cause any misunderstandings here. They are also used with softeners such as 'kısa bir süreliğine (for a little while), bir günlüğüne (for one day)'. These indicate that the requester does not have any plans to possess them.

Example 4 (T)

Gülşen çok zor durumdayım canım, yardımına ih-tiyacım var. Sınava çok az kaldı ve benim notlarım tam değil. Sana uyarsa notlarını bir günlüğüne bana verebilir misin? Söz hemen geri getiricem.

Gülşen sweetheart I am in a very difficult situation, I need your help. Not much time left before the finals. If it suits you, could you give me your notes for the day? I promise I will bring (them) back.

However, in the English data, we see that 32.20 % informants used the verb 'give' and 6.6 % used the verb 'take'. Unlike their Turkish equivalents, these verbs in English gives the impression that the requester would like to

possess them. This could potentially cause misunderstandings, which is referred to as 'pragmatic failure' in Thomas (1983).

In addition, address forms also indicate that the speaker assumes more Power. Some of these sounds kind of sweet talk and friendly and a couple of them sounds rude.

Table 5: *Address forms in Turkish and in English*

Address Forms in Turkish	Address forms in English
Canım (sweetheart)	My dear
Tatlım (sweety/ honey)	Sweetheart
Güzelim (lit. My	Honey
beautiful darling)	Kids
Bızdık (little one)	Boy
Fıstık (lit. nut)	Stupid boy
Delikanlı (young man)	
Çocuklar (kids)	
Lan (mate, rather argo)	

Table 6: *Analysis of the frequently used verbs used in* **=Psituation** *in English.*

Verbs in English	Frequency %
Lend	37.90
Give	32.20
Borrow	16.60
Take	6.60
Others	13.30
Total	100

In the third situation, the informant does not assume power over the other person. It is the opposite.

SITUATION 3

Imagine that you are staying in the student accommodation on campus. You are new. You hear high volume music coming from your next-door neighbour who has been living here for over four years. You find this very disturbing. How do you ask him to be quiet?

In student accommodation, there is a complicated power relationship. Older students who have lived in one place long enough assume more ownership of the place and consequently more power. There seems to be a tacit agreement on this among students, and newcomers notice this soon after their arrival.

Table 7: *Analysis of* **-P situation** *in Turkish and English.*

	-Power Situation 3				Total
Groups	D	CI	NCA	A	
English Data	10	84.5	5.5	0	100
Turkish	6.6	93.4	0	0	100

Both groups preferred CI strategies. In the Turkish data, its frequency is 93.4 % which indicates a tendency of being indirect when interacting with power unequal people.

Example 5 (T)

Merhaba, sınavlara çalışıyorum ama müzik çok rahatsız ediyor. Sakıncası yoksa sesini kısabilir misiniz?

Hello, I am studying for the exams, but the music is bothering me very much. If you don't mind could you turn the volume down?

The results show that Conventionally Indirect Strategies were preferred most especially in Turkish.

Table 8: *Analysis of the frequently used verbs used in -P situation in Turkish.*

Verbs in Turkish	Frequency %
Kısmak (turn the volume down)	58.8
Sessiz olmak	18
Dinlenmek (having a rest)	17.7
Others	5.5
Total	100

The verb 'kısmak' (turn down) with the possibility indicator. '-ebilmek' (ability) suffix was used very often in the Turkish data and 'turn down' in English. It seems to be the best choice. That is, it does not aim to stop the other person's wish to listen to music.

Example 6 (E)

Hello, I am studying now and the volume of your music is disturbing me, please down the volume.

Table 9: *Analysis of the frequently used verbs used in -P situation in English.*

Verbs in Turkish	Frequency %
Turndown	53.5
Be quiet/ silent/ careful	25.5
Listen	10
Turnoff	7.7
Others	3.3
Total	100

DISCUSSION AND CONCLUSION

The present study aimed to answer two research questions. The first one was to find out about to what extent Turkish ELT teacher trainees can choose to use appropriate forms in both Turkish and English to make requests

by considering the politeness variable Power (Brown and Levinson 1987). The second question was to find which politeness strategies the trainees tended to use.

The study focused on the variation of one politeness vari-able, power depending on the context of the situation. The analysis of Turkish and English data which was elicited using Dis-course CompletionTasks revealed that majority of informants preferred Conventionally Indirect Strategies (CI). They used these with modal verbs such as can/ could / would etc. When they were supposed to address children and close friends, they tended to use Direct (D) strategies more often. Especially in the case of asking a good friend's help, the ratio is higher in Turkish (14.5 %) in comparison to that of in English (11.3 %).

Participants' limited grammar knowledge and vocabulary may cause some problems. For example, they tend to confuse vocabulary in English like **borrow** and **lend**, and make grammar mistakes. They also transfer some vocabulary from Turkish into English, such as the verb '**vermek**' (give) in Turkish is not the equivalent of **lend** in English. That is, it is not just the wrong word choice. It can lead to terrible misunderstandings and consequently, pragmatic failure (Thomas 1983). Similar results have also been reported in Karatepe (1998), (2001) and (2016)).

In all situations, a supportive move as a grounder was used. Various studies have reported that giving a reason is the most frequently occurring supportive move (Faerch and Kasper 1989, Economidou-Kogetsidis 2009 & 2011). In power equal situations, grounders are used to explain the difficulty the person is having persuasively. They appeal to the listener's goodwill and understanding by being verbose. However, in situations where they feel they have less power, the addressee appears to be less verbose while explaining the reason for their request. The use of ground-

ers indicates the extent to which language users could be strategic in their choice of politeness strategies. Brown and Levinson (1987) noted that individuals tended to employ both positive and negative politeness strategies. That is, by giving a reason for their request individuals appeal to the addressee good-will and understanding because by using a grounder they assume that the addressee would be persuaded upon learning about the reason for the request and give a positive reply.

For this reason, the use of a grounder could be an indication of positive politeness strategy (see also Hassall 2001). Moreover, a grounder could also indicate the use of a negative politeness strategy because it aims to make the addressee clear that their assistance is needed; otherwise, the addresser would not have bothered him/her. That is, the addresser would not usually disregard him/her freedom of action and independence for nothing but the situation is not normal. It, in a way, an indication that the addresser has no other choice but ask for a favour.

The data analysis suggests that our teacher trainees appear to have awareness about how different factors can determine language forms and politeness strategy in certain situations. However, this ability may not guarantee that they would be able to use the same knowledge in real interaction.

The findings have important implications for teacher education. Pragmatic ability and knowledge are essential for teachers so that hey can teach this to their students. However, many studies have reported that pragmatic ability is not highlighted (Karatepe 1998; Wyner & Cohen 2015). Certain aspects of pragmatic ability may not be learned in a short time but learners should be provided metalinguistic knowledge about language use. When teachers are more aware they see the need to consult to websites and

native speakers who may be available. Among web sites, CARLA (the Center for Advanced Research on Language Acquisition) can be a good source for teachers and teacher candidates. Besides, teacher trainees need to be more motivated to carry out their small projects to understand how speech is used in particular contexts. They can be guided to analyse films and TV series.

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CURIOSITY AND INTEREST-BASED LEARNING

CHAPTER 3

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INTRODUCTION

Curiosity is the desire and wish to understand and learn a phenomenon. Creating a sense of curiosity in children during education and training enables children to be educated in subjects that they are interested in as well as other subjects that they are available to learn. The children at school ages can be motivated by creating new, unexpected, surprising, suspicious, contradictory situations and creating curiosity for searching and finding (Peterson, and Skow-Grant, 2003). These depend on the creativity and preparation of the teacher (Başar, 1999). The teacher can trigger the student's potential sense of curiosity. Here the creativity of the teacher, personality traits of the teachers and the students can be effective in arousing curiosity.

While the sense of curiosity is a psychological condition that involves increased attention, increased desire to learn, continuity and an emotional attachment, it transforms these emotions into a conscious search for knowledge by guiding children to focus and be motivated in selected activities.

All discoveries and inventions in the history of humanity have been thanks to curiosity. People have discovered that the earth is round because they wonder beyond what they see, and that the earth turns because they wonder why the sun disappears in the evening. Without curiosity, there would be no so much science or so many inventions. It is the curiosity of a person that enables the development of new concepts and new theories. Albert Einstein said "*I have no special talent, I am just a person with a passion for curiosity."*

Curiosity and Interest

It is true that some people are curious and some people are not, but in fact everyone has the same urge to wonder

when they are born. We are all born with an endless urge of curiosity, but most of us lose our urge for curiosity over time with the education we receive in both families and schools. The most important point here is to determine the real interests of the individual in what they need and to make them curious of what they should learn.

Although interest and curiosity seem to be separate structures, it can be mentioned in the literature that there are distinctions in the literature that these two structures are the same or interest is situationally experienced but curiosity is a personality dimension that triggers the same experience (Kashdan, 2004; Silvia, 2006). Interest or curiosity was studied as a structure that was handled in different dimensions. Accordingly, as a motivation in the literature due to curiosity-inducing conflict or disagreement (Berlyne, 1954), as a situational variable (Hidi, 1990), as a personal feature that has a role in the choice of profession (Holland, 1997), as a feeling (Silvia, 2005), as a developmental feature (Hidi and Rennninger, 2006), which allows the individual to regulate himself in the face of situations (Sansone and Thoman, 2005) has been the subject of research as a structure. From the functionalist point of view, William James states that curiosity leads the creatures to discover the environment in which they live. However, he adds that this discovery can trigger another emotion, fear. There are studies conducted independently with different research questions in many subfields of psychology about interest and curiosity, which is considered as an impulsive-emotional element that triggers the actions of discovery and successively directs the behaviour of individuals (Silvia, 2006; Renninger and Hidi, 2011).

Berlyne researched the causes of discovery behaviour through experimental studies and stated that curiosity and accompanying discovery behaviour were revealed by variables such as innovation, complexity, uncertainty and

conflict. According to Berlyne, the existence of these variables to a certain extent triggers discovery, while being too high causes anxiety and avoidance. So, like W. James, Berlyne mentions that there is a connection between curiosity and anxiety.

The sense of curiosity in literature of educational psychology goes back to ancient times. In addition to arousing the interest of the students in education, it was stated by the famous educators that they should receive education in accordance with their interests and abilities. However, the question of what interest is and how it can be directed is a topic that is frequently emphasized in learning. Despite the large number of studies on "anxiety that might be suggested to trigger an avoidance response to a new learning situation, studies on interest and curiosity have been limited (Silvia, 2006). However, interest or curiosity is a motivational-emotional variable that affects people in their orientation towards new learning experiences and discovery behaviour (Hidi, Renninger and Krapp, 2004). As a positive emotion, interest and curiosity lead individuals to explore and pursue their efforts in this direction. Dewey was one of the first to express opinions that education and performance would bring learning and performance together. In his book, *Interest and Effort in Education,* Dewey presents opposing perspectives on the educational view that is based on the student's individual interests and questions, as well as on the view that it is possible to achieve sufficient work and effort. According to him, the education carried out in line with the interests of the student is more effective than the education which aims to develop the student even though he is not interested.

Curiosity and Interest in Educational Psychology

The interest and curiosity attributed to the behavioural and then cognitive approach is the dominant paradigm in the field

of educational psychology despite the importance of the pioneers of educational psychology such as James, Dewey and Thorndike, and studies on motivational-emotional variables have been rather limited until the early 1990s (Meyer and Turner, 2006; Linnenbrink and Pintrich, 2002).

In literature, Hidi (2001) argued that initial studies focused on how the interest emerged situationally and examined the role of interest in learning a reading piece for this purpose. In this review, the role of different environmental characteristics in triggering and sustaining interest is emphasized. The basic assumption in these studies is, in the footsteps of Berlyne's work, an understanding of the limits and characteristics of a state of interest for everyone. That is, not individual differences but similar reactions of individuals to specific situations and objects are the focus of research. In this way, what is interesting text features for everyone was investigated. It is possible to classify these studies under the title of situational interest studies.

Like Hidi, Renninger (2000; 2011) stated in his study that the classification of individual and situational interest is often emphasized in pioneering studies, which will provide the basis for a four-stage model of the development of interest. Accordingly, situational attention is the response to attention directed to certain characteristics of the environment and the ongoing or affective response that ends after a while. On the other hand, individual attention is defined as a more permanent structure and it is a specially organized form of directing attention and taking action against certain issues.

Schiefele (1991) and Harackiewicz et al (2008) claimed that triggering interest and curiosity in the learning environment creates a lasting curiosity about the subject of learning and facilitates the learning of the discovery with the emergence of discovery behaviour because attention

and effort are directed to a topic of interest, and deep processing strategies are used. Sansone and Smith (2000) argue that the existence of a developed interest allows students to manage their own interests with self-regulation. Similarly, the initial situational interest allows students to set specialization goals for themselves throughout the process, thereby maintaining their interest in the subject area and striving towards their specialization goals. In the light of these findings, the existence and maintenance of interest and curiosity contributes to lifelong learning (Kayalar and Kayalar, 2017).

McWhaw and Abrami (2001) and Laçin et al (2009) mentioned in their study that although the relational findings are informative, in order to better understand the role of interest in learning, it is necessary to understand the changes in the learning process due to interest. For this purpose, after the experimental method is separated according to the level of interest of the students, the focus is on comparing the differentiation created by a learning experience. The high level of interest in these comparisons affects the number of quantitatively recalled information, however high interest can also increase the quality of learning by providing a deeper understanding. In another longitudinal study conducted with secondary school students, students' interest in mathematics had no direct effect on mathematics achievement, but children with more interest in mathematics tend to choose courses on more advanced mathematics topics. According to the findings of the same study, success affects interest. Accordingly, students with higher achievement reported more mathematical interest in the final measurement than those with less achievement.

Krapp (1999) suggests that the relationship between situational and individual attention can be explained in a developmental way. Accordingly, it is stated that the continuation of situational experiences serves to create

well-structured individual interests. This view put forward about the development of interest has important implications for education. Interest development is important in terms of educational objectives and outcomes. As a result of the situational interest that emerges in the face of environmental conditions, it is possible to develop a more permanent interest in the object. One of the important questions that educational psychology tries to answer is how the situational interest - interest in mathematics - can turn into a permanent interest in the education process and thus support learning. In the studies, it is observed that as interest progresses in school levels, there is a decrease in students' interest in school activities with increasing age.

According to the study carried out by Cherestensen (2007), in terms of educational studies, how interest arises not only as a predictor variable but also as a result is another subject that is investigated. Investigating how the interests of the students develop and which conditions and school content can be adapted to students' interests is important in terms of the suggestions that educational psychology will develop for practice. For example, in real-life learning contexts, students were found to be more successful in showing interest, understanding and making knowledge permanent. Again, the reorganization of the learning environment has a role in the emergence and direction of interest. For example, after explaining to students the difficulties that scientists in physics have to overcome in their lives related to their subject areas, students' interest towards physics course increased, compared to the group who did not receive such information or only listened to the achievements of scientists. Similarly, the amount of information they remember and their performance in the questions asked are higher (Hong and Lin-Siegler, 2011). In addition, some teacher-specific characteristics may have a distinctive role in triggering situational interest. Social adaptation, especially the cognitive adaptation established

with the teacher, and the depth of the subject's knowledge of the subject area direct the interest of the students in active learning environments more effectively (Rothgans & Schmidt, 2011).

Hullemann et al (2010) argued that, the explanations provided by the expectation value theory are also valid in the development of interest in academic subjects. According to the expectation-value theory, success expectations affect performance. In an experimental study by them, the effect of an intervention on the usefulness of knowledge in individuals with low and high mathematical expectations was examined. According to the results, usefulness / utility intervention increased the interest of individuals regardless of their level of expectation about mathematics achievement. While the participants in the experimental group reported more interest at the end of the experiment, the highest interest was reported in the experimental group with low expectations of mathematics achievement. Again, the group that reported the least interest in the mathematical technique taught was the control group with low expectations of success.

Brain and Curiosity

The hippocampus, which is located in the middle part of human brain, which is in three sections, is the center of the memory. This center acts as the printer of the brain. It is the department that decides whether information should be transferred to permanent memory or not. The brain constantly collects information even during sleeping. The hippocampus stores the most important of this information for the individual. According to the importance of this information, it is stored in either short-term memory or sent to the active memory of conscious events. Short-term memory information takes only 30 minutes. If a person cares about this information, it passes into long-

term memory and must be repeated within at least twenty-four hours to gain space. The information coming from the events that we do not care about, in short, emotions are not in the form of low frequency electrical signals. As a result, weak synaptic bonds are formed and no recording to the brain cortex occurs. In such situations emotions do not take action. In cases in which emotions awaken, the hippocampus is activated and the recording to the cortex is completed. As Caine and Caine (2002) states, the cortex that constitutes the outer brain part is the part where the brain thinks, speaks, writes, makes new discoveries, makes curiosity, plans, learns, intelligence and memory and has an unlimited capacity. It is in constant communication with the vision, hearing and other perception centers and the outside world. If curiosity and interest-based information is emotion-provoking events, then hippocampus in the middle brain allows them to enter, thus information is recorded on the brain cortex. In order for the brain to store information in permanent memory, it is necessary to make the subject interesting. In other words, it is essential for the student to be motivated and curious about a subject and then to give some information. The first is the learning by memorizing, listening or reading the first one, and the second is self-discovery, experimenting or finding. The first of these learning methods takes place with the left side of the brain and the second with the right side. The two sides of the brain are complementary (Polat, 2014). Beyin temelli öğrenmenin açilimi nedir? Eğitim ve Öğretim Araştırmaları Dergisi Journal of Research in Education and Teaching Mayıs 2014 Cilt:3 Sayı:2. The work of both improves learning many times. For this reason, we should not blunt someone from the right or left side by doing the same things in our daily lives.

CONCLUSION

Learning is a natural process. From birth, all living species focus on exploring the world with the basic motive of being able to adapt and survive in the environment in which they live. During this discovery, they learn and develop. Specifically, the creature whose security needs are met is more interested and curious about making new discoveries and learning. In other words, it is motivated for learning. Such a natural mechanism that determines the learning process provides a perspective on participation in education in general and in the educational activities in particular in the school.

As one of the most prominent scientists in the field of Educational Psychology, Dewey said, education at school is as successful as it approaches the functioning of the natural learning process. The basic assumption of student-centered approaches derives from this need. Education is not life itself, but life itself. Only if the school allows individuals to maintain their interest and curiosity from birth, can the possibility of learning natural and the possibility of controlling and regulating the student's own learning be mentioned. However, the school has the role of being a disciplinary institution in which social control is provided through the power of knowledge. This may be an obstacle to the motivation of individuals to serve their voluntary participation and discovery.

There is a need for an approach that triggers the students' interest and curiosity and aims the development of their interest in the provision and maintenance of voluntary participation in school activities (İnan Kaya, 2016). However, in motivation studies conducted in the field of educational psychology (Izard, 1991; Elliot and McGregor, 1999; Cassady and Johnson, 2002; Silvia, 2005, 2006; Börü, 2018), the importance given to motivational-emotional variables has been limited for a long time. On the

other hand, the role of variable as a motivational-emotional variable on learning and achievement has been frequently investigated and reported to be related to anxiety avoidance response. In this respect, intervention studies aimed at reducing anxiety in participation in school activities gained importance. However, curiosity and interest are motivational-emotional variables that prioritize and sustain discovery and approach behaviour. From this point of view, it is suggested that the focus should be on the discovery behaviour related to it and directing the intervention studies in order to provide voluntary participation in school activities, especially as preventive studies.

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PRESCHOOL TEACHERS' PERCEPTION OF SCHOOL LIFE QUALITY AND PROFESSIONAL EFFICACY

CHAPTER 4

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INTRODUCTION

Teachers are one of the elements that play a role in education, teaching and methods and managerial roles related to the same, enable information, ideas and personalities to interact for change and development, ensure that democratic attitudes and applications aiming and encouraging this are existent.

In today's world of rapid development and change, the greatest effort of all nations is bringing up individuals who are equipped enough to keep up with this change process. The most effective tool in realizing this objective is education and teachers are an important element of such effective tool. Therefore, teachers have to be trained so well that education systems taking up the upbringing responsibility of manpower required by the country can function efficiently (Çelikten, Şanal and Yeni, 2005).

People's having a bad time at workplaces where they spend a majority of their lifetimes means their personal lives are bad as well. Teachers, too, spend most of their times at schools and with their students. Therefore, satisfaction or lack of satisfaction they have from their jobs is reflected upon quality of education and teaching. A school life of quality will improve teachers' levels of satisfaction and make them feel happy and confident and satisfy themselves over what they do. This will have positive reflections over education-teaching process, in turn, enhance the quality (Korkmaz, 2009).

Present and increasing responsibilities teachers have change the competencies they have to possess. Level of teacher competencies will affect learning of teachers. The more competent a teacher is, the more learning by students and permanence of learning will increase (Turan and Turan, 2009).

Given the fact that solution of problems and development of individuals can be realized with education, more importance will be attached to quality of the education. Enhancing quality of education services depends on improvement of teachers' competencies. A research conducted by OECD in 2003 points out that qualified teachers are needed even more in those countries that are not so strong financially and quality of education services in these countries has to be increased.

It is stated that teacher competencies mean knowledge, understanding, skills and attitudes teachers have to posses in order to fulfill duties and responsibilities required by teaching (Şahin, 1992; MEB 2011).

Teacher efficacy perception is defined as beliefs of teachers regarding their ability to fulfill teaching duty successfully in a certain situation and demonstrate those behaviors required to change behaviors of students (Tschannen-Moran and Woolfolk Hoy, 2001). Teacher efficacy perception was divided into two by Gibson and Dembo (1984) as personal teaching efficacy and general teaching efficacy. Personal teaching efficacy perception is based on self-efficacy theory by Bandura (1977) and embodies beliefs of a teacher about his own skills. General teaching efficacy, however, is correlated with outcome expectation concept containing an individual's beliefs with regards to levels of controlling the environment one learns with education, intelligence, and family education. Thus, teacher efficacy is composed of sum of extra-class factors and perception of personal effects (Milson and Mehlig, 2002). Bandura (1993) suggested that personal factors, environmental factors and behaviors create a mutual system in the form of three components, influence one another during early stages of teaching career and determine teaching efficacies.

There are positive relations between teacher's sense of efficacy and learning products of students. Doubtlessly, a qualified and efficacious teacher will influence production of desired changes in students and achievement of program targets (Büyükkaragöz, 2002 and Sünbül and Aslan 1997). It was found out that well-educated teachers with a high sense of efficacy have a positive influence on their students, produce a driving power in them, while those teachers with low sense of efficacy act impatiently and they influence students negatively (Gibson and Dembo, 1984; Tschannen-Moran and Woolfolk Hoy, 2001; Bandura, 1993; Pajares, 1997; Gibbs, 2002).

School life quality emphasizes an additional role of "modern school" as an institution that is non-intellectual, increasing well-beings and educational outputs of students (Karatzias et al., 2001a: 265).

Epstein and Mc Partland (1976) as well as Williams and Batten (1981) examined school's life quality by benefiting from dimensions of general life quality (Akt: Sarı, 2007: 70).

School Life Quality has been used as an indication of well-beings of students and can be defined as a general welfare of students correlated with school life and school climate. School satisfaction or dissatisfaction is a cognitive assessment of school life quality and can be considered as a subjective tendency (Karatzias, Athanasiou, Power and Swanson, 2001a: 91).

Therefore, perception level of teachers on institutions they teach makes one believe that this will influence their teaching efficacy. By taking this assumption as starting point, it is thought that the present study will offer contribution to the field.

Basic objective of the study in line with reasons specified above is determining preschool teachers‘ sense of school life quality and their perception level of professional efficacy. Questions the present study seeks to answer in line with this basic objective are as follows:

For preschool teachers,

1. What are their perceptions of school life quality?
2. What are their perceptions of professional efficacy?
3. Do their school life quality perceptions and professional efficacy perceptions vary depending on;
   a. Gender
   b. School type (private /state)
   c. Seniority?
4. Is there a significant correlation between school life quality perception and professional efficacy perception?
5. What are their thoughts on school life quality and professional efficacy perceptions?

METHODOLOGY

In this study, to determine the relationship between perception of the teaching profession and quality of school life of pre-school teachers, mixed methods are used including both qualitative and quantitative research approaches. Mixed methods of data using a single study with qualitative and quantitative approaches or methods that are collected and analyzed, which is defined as the integration of the findings and conclusions of the work is done. This method is defined to increase the validity and reliability of the study findings is effective in providing a

more in-depth and comprehensive study of the phenomenon (Greene, 2007). At the same time, finding answers to the questions that can not be explained by other research methods, providing strong inferences, also because of its ability to offer a variety of different opinions, there are outstanding aspects compared to other methods (Tashakkori and Teddu in 2003). When literature is examined, it is seen that there are various classifications for mixed methods. One of this classification also has been made by Cresswell and Plano Clark (2007), According to Cresswell and Plano Clark (2007), mixed-methods designs are divided into six such as convergent parallel desing, sequential explanatory desing, sequential exploratory desing, embedded desing, transformative desing and multiphase design. Considering the classifications made by Cresswell and Plano Clark (2007) inthis study, convergent parallel desing is used. According to this pattern, according to the research questions, qualitative and quantitative data were gathered together in the same stage of the research. Qualitative and quantitative data are not priorities relative to each other, have the same importance. Qualitative and quantitative data do not priorities have relative to each other, and have the same importance. Qualitative and quantitative data are analyzed separately, and than data were reviewed in order to explain the same phenomenon in comparison with.

In the analysis of qualitative data, content analysis was used. Conceptualization of data collected in the content analysis, then be organized in a logical manner according to the emerging concepts, and accordingly it is subject to the creation of themes explaining the data (Yıldırım and Şimşek, 2003). Frequency of use of the expression for the theme, frequency list is given by (Weber, transmitted by Yıldırım and Şimşek, 2003: 180) . Statements of some students are given over without any changes. to demonstrate the existing situation as it is. When the findings are being served, codings are given such as O1, O2, O3… to the pa-

pers that the findings are taken and this coding is listed at the beginning of findings. For the reliability of qualitative data analysis, the reability formula developed by Miles and Huberman (1994) (Reliability: Consensus / Consensus + Dissidence) is used.

Thus, the sub-themes of the consensus among experts and the disagreements are identified, and the compliance rate between the views of two experts and the reliability formula can be determined (Act. Yanpar Yelken, 2009, 8). Fort his purpose, written data obtained as a result of meeting are read separately by two people who are researchers and experts in their field and than the codes are issued. Based on the relationship between the codes, themes that constitute the main line of research findings have been established by determining similarities and differences. As a result of this process for determining the reliability of the data analysis, results of Miles-Huberman formula reliability value for each theme has been found to be up to .70. This shows that the researchers' encoding is reliable.

PARTICIPANTS

Population of this research is preschool education schools located in the province of Mersin which were open for education during the 2012-2013 education-teaching year. 2 methods were used during selection of sample from such population. The first method is Stratified sampling. Stratified sampling is used where there are sub-strata or sub-unit groups in a population with defined borders. What matters here is studying on the population by starting off from existence of sub-strata within the population. (Yıldırım and Şimşek, 2008;105). The province of Mersin is composed of 4 counties. These are Akdeniz, Toroslar, Yenişehir and Mezitli counties. While selecting sample for research, priority was given to schools located in the city center of Mersin. The second method employed to select

sample was maxim diversity. Objective of this method is creating a relatively small sample and reflecting diversity of individuals who may be party to the studied problem at a maximum level. According to Patton (1987), creating a small sample with maximum diversity has at least two benefits. (1) Description of peculiar dimensions of every situation included in the sample in a detailed way and (2) revealing of common themes that may arise between situations that are largely different and their values. By taking maximum diversity sampling as basis in this study, social-economic levels of schools located in the central counties of Mersin were taken into account and schools from which data were to be gathered were determined accordingly.

57 preschool institutions and 170 teachers were reached in order to apply scales prior to research. Frequency and percentage distributions regarding variables such as gender, seniority and type of school where they teach of those teachers taking place in the study are shown below.

The reason of that the said provinces and towns take part in the study is because of the fact that these regions have received extensive immigration and because of the idea that this situation directly affects education. Ültanır (2003) expresses that by considering the characteristics of the school type, the number of students, socio-economic and cultural features, the problem areas in the school, parents' education levels, and so on, students' pre-school and elementary school guidance and counseling programme should be structured with an emphasis on developmental characteristics. Such different features of both teachers and students are encountered frequently in the areas of migration It draws attention to the fact that pre-school education intended fort he students who are at risk because of migration or because of different reasons, is important. One of the most intense urban migration in our country

occurs in the province of Mersin. Therefore, in a region with high migration and low socio-economic level, it is inevitable that the differences in quality of life can be experienced in school and professional efficacy. Therefore, the opinions of the majority of teachers in pre-schools in the region where the children of the families from migration go is seen as critical to reveal the situation.

Table 1. *Frequency and Percentage Distribution of Teachers According to Their Genders*

Gender	**f**	**%**
Female	164	95.9
Male	6	4.1
Total	170	100

Seniority	**f**	**%**
0-5 years	41	24.1
6-10 years	67	39.4
11-15 years	31	18.2
16-21 years	6	3.5
21 and above	25	14.7
Total	170	100

Teachers participating in the study group consisted of female teachers by 95.9% (f=164) and male teachers by 4.1% (f=6) .

Table 2. *Distribution of Teachers by Seniority*

As can be seen in the Table 2, 24.1% of teachers participating in the study group had seniority of (n=41) 0-5 years, 39.4% (n=67) 6-10 years, 18.2% (n=31) 11-15 years, 3.5% (n=6) 16- 21 years and 14.7% (n=25) 21 and above.

Table 3*: Distribution of Teachers by School Type Where They Teach*

School Type	**f**	**%**
Private	10	6
State	160	94
Total	170	100

As is seen in the table 3, 6% (n=10) of teachers participating in the study group work at private schools while 94% (n=94) of them work at state schools.

DATA COLLECTION TECHNIQUES

At data collection phases, first of all, official permits were obtained in order to apply data collection methods at the preschool institutions and researchers visited schools previously determined and applied scales, personal information form, school life quality scale and professional efficacy perception scale. Once scales were applied, interviews were conducted with 20 teachers and replies to interview questions were recorded upon consent of teachers. Data collection tools used in this research are described below.

a. Professional Efficacy Perception Scale: The scale is a five-point Likert type consisting of 30 items developed by Erkuş, Çakır and Kılıç (2004). According to results of analysis conducted by researchers, it was found out that all of the items are selective. It was suggested that the scale tends to group at a single factor although there are six factors with eigenvalue above 1,0 as a result of factor analysis of basic components. Cronbach's Alpha internal consistency coefficient of the scale was found as 0,80.

b. School Life Quality Scale: School Life Quality Scale developed by Sarı (2007) is made of six dimensions (school management, teachers, feelings on school, teacher-student communication, status, teaching program). The scale is composed of 50 items each of which has a five-point Likert type rating (1. strongly agree, 2. agree, 3. occasionally agree, 4. disagree, 5. strongly disagree). 33 of these items were positive and 17 of them were negative. The lowest score in the scale was 50, and the highest was 250. With regards to six sub-scale explaining 53.21% of

total variance, Cronbach alpha internal consistency coefficient was determined as .94.

Interview questions: By the researcher, 6 questions for interview have been prepared In order to describe the in-depth views on teachers' perceptions of their professional competence and quality of school life. The opinions obtained from the literature for the preparation of interview questions have been effective. In addition, generated questions have been examined by two people who are experts in their field and the final shape was given to the questions.

Data Analysis

Data gained from information form and scales were analyzed in SPSS 14.0 software package. Descriptive statistical (figure and percentage) values belonging to demographics were given for sub-problem. Arithmetic mean and standard deviation calculations were made in order to determine teachers' school life quality and professional efficacy perception levels. Also, Mann-Whitney-U and Kruskall Wallis Test, nonparametric tests, were used in order to determine variance of teachers' school life quality perceptions and professional efficacy perception levels according to gender, professional seniority, school type (private / state). Correlation test was conducted in order to determine if there is a relation between scores of teachers' school life quality perception and professional efficacy perceptions. Data gained from interview questions were evaluated through content analysis.

RESULTS

The first sub-problem of the present research was expressed as "what are school life quality perceptions of preschool teachers?. Table-4 below shows descriptive analyses regarding the first sub-problem.

Table 4. A*rithmetic mean and standard deviation values regarding school life quality perceptions of teachers teaching at preschool institutions*

Scales	**N**	**X**	**Ss**	**Min-max**
school life quality scale	170	1.63	2.10	80-214

As is seen in the Table-4, mean regarding school life quality is (x=1.63). Therefore, it may be said that teachers' perceptions are low in terms of school life quality.

The second sub-problem was expressed as "what are professional efficacy perceptions of preschool teachers?". Table-5 below shows descriptive analyses regarding the second sub-problem.

Table 5. *Arithmetic mean and standard deviation values regarding professional efficacy perceptions of teachers teaching at preschool institutions*

Scales	N	X	Ss	Min-max
professional efficacy perception	170	1.01	1.50	46-120

As is seen in the Table-5, mean of teachers regarding professional competence perception is (x=1.01). Therefore, it may be said that teachers' perceptions are low in terms of professional competence.

The third sub-problem is expressed as "Do their school life quality perceptions and professional competence perceptions vary depending on;

a. Gender,

b. School type (private /state)

c. Professional seniority?".

It was found out that data do not show a normal distribution in the analyses conducted. That's why nonparametric tests were used in the analyses.

a. According to Gender Variable;

Whether or not Preschool Teachers' Perception of School Life Quality and Professional Competence have differed according to gender was determined according to Mann-Whitney U Test. Results of Mann-Whitney U Test are shown in the Table-6.

Table 6. *Mann-Whitney U Test Results of Preschool Teachers' Perception of School Life Quality according to gender*

Gender	N	Mean Rank	Total Rank	U	P
Female	163	86.31	14068.00	439.0	.301
Male	7	66.71	467.00		

As is seen in Table-6, preschool teachers' school life quality perceptions do not show a significant difference according to gender factor (p=.301).

Whether or not Preschool Teachers' Professional Efficacy Perceptions have differed according to gender was determined according to Mann-Whitney U Test. Results of analysis are given in Table-7.

Table 7. *Mann-Whitney U Test Results of Preschool Teachers' Professional Efficacy Perception according to gender*

Gender	N	Mean Rank	Total Rank	U	P
Female	163	86.55	14107.00	400.0	.178
Male	7	61.14	428.00		

As is seen in Table-7, preschool teachers' professional competence perceptions do not show a significant difference according to gender factor (p=.178).

b. According to School Type Variable;

Whether or not Preschool Teachers' Perception of School Life Quality and Professional Competence have differed according to school type was determined according to Mann-Whitney U Test. Results of Mann-Whitney U Test are shown in the Table-8.

Table 8. *Mann-Whitney U Test Results of Preschool Teachers' Perception of School Life Quality according to School Type (private / state)*

School Type	N	Mean Rank	Total Rank	U	P
State	159	84.91	13500.0	780.0	.549
Private	11	94.09	1035.0		

As is seen in Table-8, preschool teachers' school life perceptions do not show a significant difference according to school type variable (private or state) (p=.549).

Whether or not Preschool Teachers' Professional Efficacy Perceptions have differed according to school type was determined according to Mann-Whitney U Test. Results of analysis are given in Table -9.

Table 9. *Mann-Whitney U Test Results of Preschool Teachers' Perception of Professional Efficacy according to School Type (private / state)*

School Type	N	Mean Rank	Total Rank	U	P
State	159	84.50	13436.0	716.0	.312
Private	11	99.91	1099.0		

As is seen in Table-9, preschool teachers' school life perceptions do not show a significant difference according to variable of school type they teach at (private or state) (p=.312).

c. According to Seniority Variable;

Whether or not Preschool Teachers' Perception of School Life Quality and Professional Efficacy have differed according to seniority was determined according to Kruskall Wallis Test. Results of Kruskall Wallis Test are shown in the Table-10.

Table 10. *Kruskall Wallis Test Results According to Preschool Teachers' Perception of School Life Quality*

Seniority	**N**	**Mean Rank**	**Sd**	**X^2**	**p**
0-5 years	41	86.65	4	1.021	.907
6-10 years	67	86.13			
11-15 years	31	88.89			
16-21 years	6	89.75			
21 and above	25	76.72			
Total	170				

As is seen in Table-10, preschool teachers' school life quality perceptions do not show a significant difference according to seniority variable (p=.907).

Whether or not Preschool Teachers' Professional Efficacy Perceptions have differed according to seniority was determined according to Kruskall Wallis Test. Results of analysis are given in Table-11.

Table 11. *Kruskall Wallis Test Results of Preschool Teachers' Professional Efficacy Perception of According to Seniority*

Seniority	N	Mean Rank	Sd	X^2	P
0-5 years	41	80.54	.856	1.333	.856
6-10 years	67	86.31			
11-15 years	31	86.00			
16-21 years	6	104.25			
21 and above	25	86.34			
Total	170				

As is seen in Table-11, preschool teachers' professional efficacy perceptions do not show a significant difference according to seniority factor (p=.856).

With regards to the 4th sub-problem of the research a correlation test was conducted in order to determine whether or not there is a relation between scores of school life quality perception and professional efficacy perceptions of teachers teaching at preschool institutions. Results of analysis are given in Table-12.

Table 12. *Correlation Analysis Results Regarding Relation Between Preschool Teachers' School Life Quality Perceptions and Professional Efficacy Perception*

		school life quality scale	professional efficacy perception scale
school life quality scale	**r**	1	.210
	p		.006
	n	170	170
professional efficacy perception scale	**r**	.210	1
	p	.006	
	n	170	170

When looking into Table -12, it is observed that there is a medium level, positive and significant relation between

"school life quality perception" and "professional competence perception" scores (r=.210, p<.01).

The fifth sub-problem of this research was expressed as "What do teachers think about school life quality?"

The fifth sub-problem of the research was expressed such as ''What are the views of the teachers on school life quality and perception of professional competence?" . Teachers' responses to interview questions asked regarding school quality of life is presented in Table 13.

Table 13. *Frequency (F) Values of Teachers' Thoughts on School Life Quality*

Theme and Sub-themes	**(f)**
A. Feelings being at school evokes in one;	
A.1. Happiness	13
A.2. Obligation	5
A.3. Desperation	3
B. Factors with negative influence on feelings;	
B.1. Managers	9
B.2. Colleagues	6
B.3. Physical Conditions	8
B.4. Working conditions	5
B.5. Student –parent profile	5
C. Factors with positive influence on feelings;	
C.1. Liking the profession	11
C.2. Loving children	16

C.3. Having a job 9

C.4. Colleagues 7

C.5. Managers

D. Solution suggestions put forward to solve the problems;

D.1. Bureaucratic regulations 13

D.2. Provision of necessary financial supports 11

D.3. Replacement of managers after a certain period 8

D.4. Improvement of physical conditions 5

D.5. Objective application of rewarding system 5

When looking at Table -13, it is observed that preschool teachers mostly feel happy to be at the school (f=13), and a very small portion of them feels unhappy to be at the school (f=3). Attitudes of managers is listed at the top of factors with a negative influence on feelings (f=9). The most important factor with a positive effect on feelings is highlighted as liking the profession (f=11). When it comes to solution of existing problems, most of the teachers (f=13) believe that the problems can be solved thanks to bureaucratic regulations, while a portion of them thinks (f=11) the problems can be solved with necessary financial supports.

Quotations from thoughts of some teachers are listed below.

> *T1: I really am happy to be working at this school, it is near my house and I love my job. It really makes me happy to be with children. However, I do think that I don't get appreciated and rewarded the way I deserve although I work harder and am more experienced than my colleagues ….*

T9: It is really honorable to be a teacher, yet I guess I would not work if I did not need money. I do not want to share the same place with my colleagues at all times. I wish I had a room of my own….. fortunately, I have a job ….

T*17: ……we are expecting more support from the state with regards to physical conditions. Whenever I talk to my colleagues, I notice that they agree with me, it is really hard to work full time at preschool institutions, dealing with young children at all times is exhausting. I guess we should get paid more as an incentive in view of all these.*

Teachers' responses to the interview questions asked for on the perception of professional efficacy are presented in Table 14.

Table 14. *Frequency (f) values of the opinion on the professional efficacy of teachers perception*

Theme and Sub Themes(f)	
A.**Feeling enough in the profession;**	
A.1. Happiness of the children.	17
A.2. Perform activities successfully.	13
A.3. To see the knowledge and skills that I wanted to give the students.	11
A.4. Communicate easily with the students.	9
A.5. Getting positive points from the inspections.	7
A.6. Appreciation of the other teachers.	6
B. **Feeling inadequate in the profession;**	
B.1. More active young people.	15
B.2. Insufficient physical conditions.	11
B.3. Negative criticism from the Parents.	9
B.4. Negative criticism of colleagues	8
B.5. The lack of sufficiently clear guide books.	7

When viewed in Table 14, the pre-school teachers mostly (f = 17)feel themselves enough in the profession, based on the students happiness, at the very least a portion (f = 6), shows that they have a positive perception of professional competence with the appreciations of the other teachers . In addition, They were expressed that they feel enough (f = 7)when the activities in the classroom which are carried out with success (f = 13) and when they establish positive functioning properly with the students (f = 9) and when they take positive points and opinions of the inspectors during the inspections. The negative perception of professional competence as representing the majority of teachers (f = 15) were expressed that they feel themselves inadequate because of more active youth. In this area, the lowest (f = 7) views expressed, is that the guide pre-school books not being enough clear. The second most important reason for teachers feeling themselves inadequate is the lack of physical conditions (f = 11), than the negative criticism coming from parents (f=8)

Some of the teachers' views are made directly from citations are below.

> T14: ….I see myself in my profession quite enough. Because my activities are very popular among the students, they are having great fun. If they're happy I am happy too, even other teachers and my friends are carrying out activities that I make in the classroom….

> T13: …… This is my 17th year in the teacher profession, I am feeling little bit more tired. Young people are doing the job better, they are getting very active with the kid and they are bouncing up and down together, I can not find that much energy in myself….. We are always in the classroom… If we have breaks now and then we can rest a little bit and I guess that would make us happier . Being with the children all the time in a closed and small place can be boring for me time to time.

T20: ..... There are also inspections. Organizing good events, teaching very well doesn't count if it's not done by the inspector's way , and you get a low score. This reduces my motivation. But I am happy in the classroom.,.. are the student receiving my instruction ? are the students having any gains? This is always more important to me then scores of inspectors.

DISCUSSION

When looking at findings derived, school life quality and professional efficacy perceptions of preschool teachers are observed to be low. Both school life quality perception and professional efficacy perception have not been studied with preschool teachers before. However, studies conducted at different levels show that perceptions of teachers are a little higher than average. During a research conducted by Sarı (2007) and Korkmaz (2009), it was observed that primary school teachers perceive life quality at schools where they teach as positive at a level that is a little higher than the average. Also, at the research conducted by Girgin, Akamca, Ellez and Oğuz (2010), it was found out that primary school teachers' professional efficacy perception is at average level. The fact that preschool teachers' school life quality and professional efficacy perceptions are low makes one think that there may be different problems related to this level. Uninterrupted long working hours, insufficiency of physical environments, and poor preschool education understanding (TED, 2007) might be giving rise to such perceptions. Preschool teachers work with young children for long hours, and make an enormous effort to help create school-parent cooperation. Also, preschool education is an era when students are extremely active and learn through games. Necessity of using diverse materials, importance of good class management at this level is thought to be the reason for teachers' low school life quality and professional efficacy perceptions.

When school life quality and professional efficacy perception was examined in terms of different variables, no significant difference was found from gender, school type and seniority perspective. When looking at the issue in respect of gender, reason for this may be the fact that preschool teaching is mostly dominated by female teachers. According to findings gained by Korkmaz (2009) who conducted a similar study, it was found out that there is no significant difference between female and male teachers in terms of teachers' level of perceiving feelings about the school, students, status, teaching program and school life quality. Likewise, (Taşar, 2012) also discovered that teachers' sense of general teaching efficacy does not vary depending on the gender variable. Findings obtained are parallel to the study so conducted. As a result of research, it was discovered that there is no significant difference in terms of teachers' sense of school life quality, whether in the first years of their careers or in senior years, that is to say, experienced. Even if it is understood in different researches that seniority gives rise to a difference (Sünbül and Arslan, 2007; Turan and Turan, 2009), no difference was found about seniority variable in terms of this research. By starting from findings of this research, it is thought that school life quality and professional efficacy perceptions may be influenced from different variables.

When looking at analyses conducted as a result of the present research, it was detected that there is a linear, positive relation between school life perception and professional competence perception. In other words, the higher preschool teachers' sense of school life quality gets, the higher their sense of teaching efficacy gets. In a study conducted by Kafkas, Açak, Çoban and Karademir (2010), relation between sense of self-efficacy and professional concerns of prospective physical education teachers was examined and such relation was found to be linear, positive. Different studies support that research so conducted.

When the interviews with teachers and quantitative findings are evaluated together, both the school life quality and professional efficacy and perception of professional efficacy of the teachers are at an intermediate level. Qualitative and quantitative data are supportive of each other. In the terms of school quality of life, the teachers are generally happy with their environment, however, it is observed that they are uncomfortable due to adverse physical conditions and managers. However, loving the profession and the children is an important factor, but it was determined that the lack of financial resources and bureaucratic obstacles are the main reasons which are affecting school quality of life negatively. Inal (2009) reached similar conclusions in his work. Within the interviews that he made with the teachers, he found the farness of home to the school, the conduct of the director of the school's, inadequate physical conditions adversely affect the quality of school life. Korkmaz in a similar manner (2009) reached similar conclusions in his study. In a study in terms of professional work attitude teachers over the age of 40 are reported to exhibit negative attitudes towards the profession. Also in this study , teachers who made this profession for a long time found the young teachers are more active and that they get tired more quickly. Therefore, the said findings correlates with the findings in the literature.

CONCLUSION

To conclude, preschool teachers' school life quality and professional efficacy perceptions were found low. No significant difference was found between school life quality and professional efficacy perception and variables such as gender, school type and seniority. Even if different studies conducted have findings showing that women perceive the profession more positively, (Lara et al., 2004) it was observed that this did not create a difference in respect of this research. However, as a result of study conducted, a sig-

nificant, positive relation was found between school life quality and professional efficacy perception. By starting off from these findings gained, it is thought that it will be appropriate to introduce necessary regulations for increasing schools' life quality and developing teachers' sense of teaching efficacy positively so that preschool teachers can fulfill their roles in education-teaching process. In order to positively increase level of teachers' thoughts on school life quality, physical construct of the school, school climate, school's effectiveness, size of the school, size of the classroom, surrounding of the school, technologies used in the school, quality of those working at the school may be improved, and cleaner and more convenient spaces may be provided within the school in respect of health and safety. Teaching profession must be improved both socially and economically, rendered attractive, personal rights must be preserved and all opportunities for education-teaching must be expanded so that teachers' sense of teaching efficacy can be developed in a positive way. It is quite important for teachers to renew, improve themselves and become self-aware about their profession so that teachers' sense of teaching efficacy can be more positive.

RECOMMENDATIONS

In the terms of the findings obtained from the studies and debates, the physical conditions of the school, climate of the school, effectiveness of the school, size of the school, size of the classrooms, environment of the school, technologies used in the school, the quality of the school personel are primarily important, school security and health must be highly considered and Improvements should be made and the work area must be more cleaner and more comfortable. For this, state has to create more resources to improve school qualities and more resources in education as a whole and create budgets for that. Teaching profession must be improved in social and economic

aspects should become more attractive, dignity and place in society, should be increased, personal rights must be protected, all facilities should be provided for education in order to develop a positive perception of the professional competence of teachers. The training of teachers at the same time, teachers should be informed so as to be adequately equipped for the teaching profession, must comprehend the importance of the profession. Considering that loving the profession is a good aspect and factor, attitude development and creating a model are thought to be useful.

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THE ANALYSING OF THE PISA 2015 TURKEY STUDENT QUESTIONNAIRE BY DATA MINING ALGORITHMS

CHAPTER 5

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1. INTRODUCTION

Artificial intelligence is a technological development that touches on human life directly, which is a concept that we frequently hear through applications such as recognition systems, text and speech analysis, autonomous vehicles, natural language translations made by machines, and intelligent search engines. One of the application areas of artificial intelligence is to discover patterns by analyzing the digital data produced through information and communication technologies. In recent years, as a result of computerization, which has become widespread in almost every field, a large amount of data is produced, stored or transmitted on a global scale. Within the data produced, there are also meaningful patterns that can be useful especially for decision makers. The study field is the "data mining" which aims to discover the useful patterns in the data. Data mining is a multidisciplinary field of study that has a direct relationship with other disciplines such as data visualization, mathematics, and statistics (Cabena, Hadjinian, Stadler, Verhees, & Zanasi, 1998).

The data to be analyzed in data mining can be structured or unstructured format. Unstructured data are documents in web sites or texts written in natural language. The structured data is typically stored in database management systems, which may be relational, object or document-based, depending on the working paradigm of the database management system. Data mining analyzes are designed as descriptive and predictive models (Kantardzic, 2011). Descriptive data mining analyzes are used for clustering, discovering association rules. Predictive data mining analysis uses past data to predict the future. An example of these analyzes is classification analysis. In these analyses, data is divided into training and testing. Algorithms are trained using the training data, and their success is evaluated using test data.

Data mining analysis consists of a) Data cleanup, b) Data integration, c) Data selection, d) Data conversion, d) Mining, e) Evaluation of results f) Presentation of information (Han, Kamber, & Pei, 2012). Data cleanup is the process of removing or replacing noisy and inconsistent data that may adversely affect the analysis. In the process of data integration, data from multiple sources are retrieved. Data analysis and integration are usually performed as a single process. The data selection process is the stage at which data is used for analysis. In the mining process, algorithms such as classification, clustering, association rules are run on the data. At the process where the results are evaluated, the success of the algorithms running on the data is evaluated. Finally, in the presentation process of the information, useful information mining from the data analysis is visualized using various data representation techniques.

As a result of the widespread use of computerization, education is one of the areas where digital data is produced and stored. Discovering useful information by analyzing the data generated through the media such as e-learning applications, learning management systems, intelligent course systems, computer-based education systems are called educational data mining which can be considered as a sub-field of data mining. (Romero and Ventura, 2013). Educational data mining analyzes can be directed to students, teachers, administrators or educational materials. In the analysis of students; approaches such as student or student behavior modeling and academic performance modeling are used. In student modeling, it is aimed that the students will be modeled according to their characteristics such as domain knowledge, learning style or strategies, learning characteristics and skills. (Eagle et al., 2012; Nandeshwar et al., 2011). In student behavior modeling, the aim is to reveal the students' behaviors within the community or their individual behavior (Malmberg, Järvenoja,

& Järvelä, 2013; Montalvo, de Baker, Pedro, Nakama, & Gobert, 2010). In academic performance modeling, students' academic performance is predicted by using data such as socio-economic status, demographic information, relationships with peers, interactions with the software system, performance scores or log. In a study by Romero and Ventura (2013), the students' grades in the final exam were estimated by computer data. Macfadyen and Dawson (2010) determined that the online activities of the students were effective in predicting their performances and suggested an early warning system for these students to their teachers. Marbouti et al. (2016), proposed a predictive model of students who were at risk of failing the course by using standards-based grading.

1.1 PISA 2015 Turkey Test

PISA (The Program for International Student Assessment) test is an international application made by OECD (Organization of Economic Cooperation and Development) which Turkey is a member since 1951, to evaluate the educational system of the countries. The test is performed every three years, and the first PISA test was applied in 2000. PISA aims to assess students' skills in science, mathematics and, reading and discusses them through the concept of literacy. The PISA Test is performed in the form of loops, where one field is highlighted. PISA Test is also possible with non-OECD countries.

In PISA applications, questionnaires are also conducted for students, teachers, schools, and parents. Students' opinions on psychological characteristics, family information, opinions and attitudes about the courses and school are asked in student questionnaires. Questionnaires are also applied to teachers, schools, and parents, in these questionnaires, their opinions and attitudes on various educational topics are taken. While participation in some

questionnaires is compulsory for all countries, others are left to the choice of countries. In PISA 2015, Turkey has joined the school and student questionnaires only.

The PISA 2015 test, which is the subject of this study, is the sixth application and it has been carried out in 72 countries, including 35 OECD members. In the PISA 2015 application, unlike previous applications, countries have the option to do the test in the computer environment. While 57 countries applied the test in a computer environment, 15 countries preferred the paper environment. For the computer-based test, 66 booklets were prepared, and 30 booklets were prepared for the paper-based test.

PISA 2015 Turkey Test was coordinated and conducted by the Ministry of National Education of Turkey, the Directorate General for Measurement, Evaluation, and Examination Services. Tests and questionnaire questions in the application were translated into Turkish and examined by the experts, and necessary documentation studies and meetings were held on how to do the test, and the participants were informed about PISA 2015. PISA 2015 Turkey test is made with 187 schools in 67 provinces and 5895 students.

When the studies on PISA Test are examined, it is seen that the number of studies using traditional statistical methods are more than the studies using data mining methods. Looking at studies using traditional statistical methods, Matějů and Smith (2015) examined the impact of gender differences on mathematics and reading skills in Czech Republic students using PISA 2003 data. Wittwer and Senkbeil (2008) used PISA 2003 data to analyze the relationship between German students' use of computers at home and their success at school. Herborn et al.there are limited empirical results on the assessment of CPS. In 2015, the large-scale Programme for International Student

Assessment (PISA, Karakolidis et al. (2016), Säälik et al. (2015)including reading. The current study was aimed to discover how student awareness and use of learning strategies explains differences in reading literacy test results, using PISA (the Program for International Student Assessment, Fischbach et al. (2013)it is crucial to empirically investigate whether PISA proficiency scores actually predict key educational outcomes. The present prospective study examined the power of domain-specific proficiency scores (in mathematics, science, and reading, Greiff et al. (2015), French et al. (2015) are some of the other studies in which traditional statistical methods are used. In terms of researches using data mining or machine learning methods; Gorostiaga and Rojo-Álvarez (2016) compared traditional statistical methods and machine learning methods on PISA 2009 test data in Spain. Masci et al. (2018) examined the relationship between the test scores and the characteristics of the schools of the students who participated in the PISA 2015 test in Australia, Canada, France, Germany, Italy, Japan, Spain, UK, and the USA.

When it looks at the studies on PISA Turkey Test; Aksu, Güzeller, & Eser (2017) examined whether there is a difference between mathematics literacy performances according to the student and school levels by using the PISA 2012 Test data. Sengul (2015), in the 2012 PISA Turkey Test, students' interest in mathematics, mathematics self-identity concept, mathematics anxiety, the teacher-student relationship has analyzed the effects of variables to mathematics performance. Baysal and Sahenk-Erkan (2012) compared Turkey's 2003, 2006 and 2009 PISA results to the school types and geographic regions. Alacaci and Erbaş (2010) examined the impact on the mathematics performance of students' school characteristics using PISA 2006 Turkey data. On the other hand, Ozdemir (2017) examined the studies using PISA Turkey data. The researcher had found only 97 studies by search indexes, and only

46 of these studies used fundamental statistical techniques and that the findings in the others consisted of repetition of findings in the PISA reports. According to the researcher, this result shows that PISA Turkey Tests and the obtained data are too limited contribution towards the development of the Turkish education system.

1.2 Research Questions

In this study, using the data mining method on the Turkey 2015 PISA data, it is aimed to answer the following questions:

1. How successful are data mining algorithms in predict to proficiency levels of the students using the answers that students give to questionnaire in PISA 2015 Turkey Test?

2. What are the questions that provide the most Information Gain value in predicting students' proficiency levels?

2. Materials and Method

2.1 Dataset

In this study, the PISA 2015 Turkey student questionnaire and test scores are used as the dataset. PISA student test and questionnaire are performed in computer or print environment according to the preference of the countries. Turkey 2015 PISA test was performed on the computer environment. The PISA tests and questionnaire data are available to the researchers and can be downloaded from the OECD website. The data are in SPSS and SAS file format, which is widely used in social sciences research and is presented in the form of merged files containing all countries' data. In this study, SPSS data were used. The SPSS file includes students' answers to questionnaire

questions, students' calculated science, mathematics and reading proficiency levels.

In the PISA test, students are divided into seven proficiency levels: 1B, 1A, 2, 3, 4, 5, six according to their test scores. PISA proficiency levels and lower scores are shown in Table 1. The test scores in the SPSS file were converted to PISA proficiency levels. For this purpose, the data in SPSS format were moved to a relational database management system and students' science, mathematics and reading skills were converted to PISA proficiency level using computer software developed by the researcher.

Table 1. *PISA Test Proficiency Levels and Lower Scores*

Proficiency Level	**Science**	**Reading**	**Mathematics**
Below level 1	0 to less than 260.54	0 to less than 262.04	0 to less than 357.77
Level 1 (1b)	260.54 to less than 334.94	262.04 to less than 334.75	357.77 to less than 420.07
Level 1 (1a)	334.94 to less than 409.54	334.75 to less than 407.47	
Level 2	409.54 to less than 484.14	407.47 to less than 480.18	420.07 to less than 482.38
Level 3	484.14 to less than 558.73	480.18 to less than 552.89	482.38 to less than 544.68
Level 4	558.73 to less than 633.33	552.89 to less than 625.61	544.68 to less than 606.99
Level 5	633.33 to less than 707.93	625.61 to less than 698.32	606.99 to less than 669.30
Level 6	707.93-1000	698.32-1000	669.30-1000

PISA 2015 Test was performed with 5895 students in Turkey. The distribution of the students according to their class was 21.6% (1273), ninth-grade students, 73.1% (4308), tenth-grade students, and 3.2% (186) as elev-

enth-grade students. Detailed information about the students in PISA 2015 Test is shown in Table 2.

Table 2. *The distribution of the students according to their class and gender in PISA 2015 Turkey Test*

		f	%
Gender	Female	2938	49.8
	Male	2957	50.2
Grade	7th	16	0.3
	8th	105	1.8
	9th	1273	21.6
	10th	4308	73.1
	11th	186	3.2
	12th	7	0.1

2.2 Feature Set

The feature set of the study consists of the responses of the students to the questionnaire questions and the PISA proficiency levels of the scores of measured science, mathematics and reading skills. PISA proficiency levels were used as a class label in the feature set. In the PISA 2015 questionnaire, over 1000 questions were asked to the students. Whether or not some of the questionnaire questions are asked to students may depending on the preference of the countries. For example, questionnaire questions on information technologies are left to the choice of countries. There are no questions about information technologies in PISA 2015 Turkey questionnaire. Therefore, questionnaire questions which were not asked students or unanswered by all students were excluded from this study.

2.3 Data Analysis

In the study, Information Gain, Naive Bayes, k-Nearest Neighbors (kNN), C4.5 and ID3 decision tree algorithms were used. Information Gain is a method of calculation

frequently used in feature selection tasks in data mining analysis. The information gain value is also used in the internal processing of some data mining algorithms. The information gain is based on the entropy formula within the Information Theory developed by Shannon (1948). Entropy H(S) is the numerical measure of the uncertainty in data and is calculated according to formula (1).

$$H(S) = \sum_{i=1}^{n} -p(c) log_2 p(c) \quad (1)$$

The information gain is calculated according to formula (2) based on entropy value. *IG(A)* in the formula is a measure of the difference of entropy occurring after separation of the dataset according to feature A. *H(S)* is the entropy of the dataset. *T* is the subset of the dataset divided by the A feature, *p(t)* is the ratio of the number of samples in *t* to the number of samples in the *S* set, and *H(T)* is the entropy of the subset of *t.*

$$IG(A,S) = H(S) - \sum_{t \in T} p(t) H(T) \quad (2)$$

Decision trees are often used in classification analysis, one of the data mining tasks. Decision trees are useful in the analysis in order to create meaningful rules from the data and to show these rules in a hierarchical tree structure. In the tree structure created by decision tree algorithms, the nodes consist of the features of the samples. The top component of the tree structure is called the root, components on the ends are called the leaves, and the other components are called the branch. Decision tree algorithms differ according to the method of creating the root, branch and leaf components of the tree. For this purpose, different decision tree algorithms were developed such as ID3 (Quinlan, 1986), C4.5 (Quinlan, 1993), Regression Trees (Breiman,

Friedman, Olshen, & Stone, 1984). In this study, ID3 and C4.5 decision tree algorithms are used.

ID3 is a decision tree algorithm developed by Quinlan (1986). In the ID3 algorithm, entropy and information gain calculations are used when deciding on which feature the root of the tree structure and how the partitioning will take place after the root. The Information Gain values of each property in the dataset are calculated, and the feature that has the highest Information Gain value is selected as the root node. In later steps of the tree construction process, the information gain values of the features are used again. Because it is based on Entropy and Information Gain values, the ID3 decision tree algorithm is called Entropy-based decision tree algorithm.

The C4.5 algorithm is a continuation of the ID3 algorithm and is a decision tree algorithm that is considered an improved version of ID3. The ID3 algorithm does not allow the analysis of features with a numeric data type in the data set. The C4.5 algorithm follows the same steps as ID3 in building the tree structure. The one difference between the ID3 algorithm; In this algorithm, the numerical values can also be analyzed.

Naive Bayes is a statistical-based algorithm and based on Bayes' theorem. $X = \{x_1, x_2, ..., x_n\}$ is the data sample whose class is unknown and whose features are x_i, C_1, C_2, .., C_n are the class labels. The probability values are calculated according to formula (3) to determine the data sample's class label.

$$P(C_i|X) = \frac{P(X|C_i)\,P(C_i)}{P(X)} \quad (3) \qquad P(X|C_i) = \prod_{k=1}^{n} P(x_k|C_i) \quad (4)$$

According to this formula, it is assumed that each x_i feature of the X data sample is independent of one another and does not affect each other. For each feature of the data

sample, the calculated probability values are multiplied and the value is obtained according to the formula (4). The class with the highest value in the formula (3)'s share is considered the class of the data instance.

In the kNN algorithm, the distances of the unclassified data instance to other instances are calculated. In the next step, *k* instances are selected at the nearest distance, the class of the majority of them is the class of the instance to be determined the class. When determining the class, for the *k* value, odd numbers are usually selected such as 1, 3, 5.

The algorithms can give different results on the same dataset in data mining analysis. This is due to the differences in the methods used in the internal structures of algorithms. Therefore, in the analysis, the results obtained using multiple algorithms are generally compared. Therefore, it is essential to know which algorithm will produce a result on the data set and which algorithm will be used in which data set to improve the results.

SPSS, Microsoft Access, Excel, KNIME and Weka (Hall et al., 2009) softwares were used for data analysis. PISA data in SPSS format was converted to Excel format firstly, then to Access database for determining PISA Proficiency Levels, then back to Excel format from Access database and finally to CSV format using KNIME software. Weka is used to run data mining algorithms in the CSV format dataset. The data mining analysis in this study, k-fold CrossValidation method was used which allows the use of a single set of data rather than a separate set of training and test sets. In this method, the dataset is divided into *k* equal parts then *k-1* parts of the dataset is used to the training of algorithms, and the last part of the dataset is used to testing. The k-fold Cross Validation method is use-

ful in the analysis because it allows the same dataset to be used for both training and testing.

2.4 Evaluation of the Success of Algorithms

In evaluating the results of the algorithms in the study, Accuracy, Recall, , Error Rate, F-Measure scores obtained by using confusion matrix were used. The confusion matrix is a table that contains the performance values of the algorithms in the analysis result. This matrix consists of the True Positive (TP), False Negative (FN), False Positive (FP), True Negative (TN) values. The *TP* value is the number of positive samples correctly classified by the algorithm. The FN value is the number of incorrectly classified negative samples by the algorithm. The FP value is the number of incorrectly classified positive samples by the algorithm. The TN value is the number of negative samples correctly classified by the algorithm. Accuracy is the ratio of the number of correctly classified instances to the total number of instances is obtained by the formula (5). The Error Rate is the ratio of the misclassified instance number to the total number of the instance and is calculated using the formula (6). The Error Rate can also be calculated by subtracting the Accuracy value from 1.

$$Accuracy = \frac{TP + TN}{TP + FN + FP + TN} \quad (5) \qquad Error\ Rate = \frac{FP + FN}{TP + FN + FP + TN} \quad (6)$$

The Recall is the ratio of the number of correctly classified positive instances to the sum of the correctly classified positive instances and the misclassified negative instances and is calculated by the formula (7). Precision is the ratio of the number of correctly classified positive instances to the total number of positive instances and is calculated according to formula (8). Another measure obtained by the harmonic mean of Recall and Precision measurements is

F-Measure measurement and is calculated according to formula (9).

$$Recall = \frac{TP}{TP + FN} \quad (7)$$

$$Precision = \frac{TP}{TP + FP} \quad (8)$$

$$F - Measure = \frac{2TP}{2TP + FP + FN} \quad (9)$$

3. Results

In the study, firstly, it was analyzed how classification algorithms were successful in predicting the science proficiency levels according to the answers of the students to the questionnaire. According to the results, the Naive Bayes algorithm showed the highest accuracy value of 37.95% in predicting the students' level of science proficiency. Following the Naive Bayes algorithm, k-Nearest Neighbors (k=5) and C4.5 algorithms reached 37.34% and 34.43% accuracy values respectively. Naive Bayes algorithm also showed the highest accuracy value of % 35.38 in predicting the students' level of mathematics proficiency. C4.5 algorithms and k-Nearest Neighbors (k=5) reached % 31.49 and %31.32 accuracy values respectively. Naive Bayes is the algorithm that achieves the highest success with an accuracy of 38.07% in predicting students' level of reading proficiency. Following the Naive Bayes algorithm, k-Nearest Neighbors (k=5) and k-Nearest Neighbors (k=3) algorithms reached %36.76 and % 33.95 accuracy values respectively.

According to these results, it is seen that the Naive Bayes algorithm have highest accuracy values in predicting students' science, mathematics and reading proficiency level. Also, the k-Nearest Neighbors (k = 5) algorithm have high accuracy values. The results are presented in detail in Table 3.

Table 3. *The Success of Data Mining Algorithms to Predict Science, Mathematics and Reading Proficiency Levels According to the Student Answers to the Questionnaire Questions.*

	Algorithm	Accuracy (%)	Precision (Weighted Avg.)	Recall (Weighted Avg.)	F-Measure (Weighted Avg.)
Science	Naive Bayes	**37.954**	0.407	0.380	0.389
	ID3	30.452	0.335	0.334	0.334
	C4.5	34.425	0.340	0.344	0.341
	kNN (k=1)	32.771	0.323	0.328	0.324
	kNN (k=3)	34.391	0.328	0.344	0.332
	kNN (k=5)	37.340	0.372	0.373	0.375
Mathematics	Naive Bayes	**35.375**	0.376	0.354	0.362
	ID3	27.076	0.305	0.300	0.302
	C4.5	31.492	0.315	0.315	0.315
	kNN (k=1)	28.508	0.299	0.285	0.289
	kNN (k=3)	29.582	0.303	0.296	0.296
	kNN (k=5)	31.321	0.323	0.313	0.315
Reading	Naive Bayes	**38.073**	0.401	0.381	0.388
	ID3	27.809	0.308	0.307	0.307
	C4.5	32.873	0.325	0.329	0.322
	kNN (k=1)	31.083	0.310	0.311	0.313
	kNN (k=3)	33.947	0.334	0.339	0.331
	kNN (k=5)	36.760	0.364	0.368	0.366

The time performance of the algorithms was also analyzed. According to the results, the fastest algorithm is Naive Bayes with 0.01 sec. Naive Bayes algorithm was followed by C4.5 algorithm with 0.5 sec. and ID3 algorithms with 0.55 sec. k-Nearest Neighbors is the slowest algorithm in the analysis. The time performances of the algorithms are shown in Figure 1.

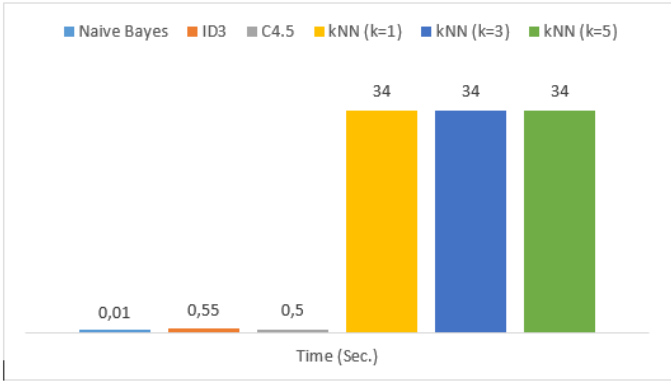

Figure 1. *The Time Performance of the Algorithms*

In the second part of the study, Information Gain values were calculated for the students' science, mathematics and reading proficiency levels. According to the results; In the dataset *"PROGN-Unique national study programme code"* has the highest Information Gain with a value of 0.135397 for predicting students' science proficiency level. This was followed by "*ST121Q01NA-<NAME 1> is motivated? Gives up easily when confronted with a problem and is often not prepared"* with Information Gain value of 0.104418 and "*ST013Q01TA-How many books are there in your home?*" with Information Gain value of 0.10241. The other Information Gain values are shown in Table 4.

Table 4. *The Information Gain Values for Proficiency Levels of the Science According to the Student Answers to the Questionnaire Questions*

Code	Feature (Questionnaire Question)	Value
PROGN	*Unique national study programme code*	0.135397
ST121Q01NA	*<NAME 1> is motivated? Gives up easily when confronted with a problem and is often not prepared*	0.104418
ST013Q01TA	*How many books are there in your home?*	0.102410
ST111Q01TA	*Which of the following do you expect to complete?*	0.101605
ST001D01T	*Student International Grade (Derived)*	0.073512

According to the results, In the dataset *"PROGN-Unique national study programme code"* has the highest Information Gain with a value of 0.10582 for predicting students' mathematics proficiency level. This was followed by "ST111Q01TA-*How many books are there in your home?"* with Information Gain value of 0.09386 and "ST121Q01NA -*<NAME 1> is motivated? Gives up easily when confronted with a problem and is often not prepared*" with Information Gain value of 0.08929. The other Information Gain values are shown in Table 5.

Table 5. *The Information Gain Values for Proficiency Levels of the Mathematics According to the Student Answers to the Questionnaire Questions*

Code	Feature (Questionnaire Question)	Value
PROGN	*Unique national study programme code*	0.10582
ST111Q01TA	*How many books are there in your home?*	0.09386
ST121Q01NA	*<NAME 1> is motivated? Gives up easily when confronted with a problem and is often not prepared*	0.08929
ST012Q07NA	*How many in your home: <Tablet computers> (e.g. <iPad®>, <BlackBerry® PlayBookTM>)*	0.06349
ST006Q02TA	*Does your mother have this qualification? <ISCED level 5A>*	0.06096

Finally, according to the results, In the dataset *"PROGN-Unique national study programme code"* has the highest Information Gain with a value of 0.13164 for predicting students' reading proficiency level. This was followed by "ST111Q01TA-*How many books are there in your home?"* with Information Gain value of 0.11629 and "ST121Q01NA-*<NAME 1> is motivated? Gives up easily when confronted with a problem and is often not prepared*" with Information Gain value of 0.11578. The other Information Gain values are shown in Table 5.

Table 6. *The Information Gain Values for Proficiency Levels of the Reading According to the Student Answers to the Questionnaire Questions*

Code	Feature (Questionnaire Question)	Value
PROGN	*Unique national study programme code*	0.13164
ST111Q01TA	*How many books are there in your home?*	0.11629
ST121Q01NA	*<NAME 1> is motivated? Gives up easily when confronted with a problem and is often not prepared*	0.11578
ST121Q02NA	*<NAME 2> is motivated? Mostly remains interested in the tasks she starts and sometimes does more than expected*	0.08907
ST001D01T	*Student International Grade (Derived)*	0.08073

According to the answers of the students to the questionnaire, when the information gain values of the questions are examined, it is seen that almost the same questionnaire questions have high Information Gain values for predicting science, mathematics, and reading proficiency levels. In particular, the *"PROGN-Unique national study programme code"* has the highest knowledge gain at all three levels of proficiency.

4. DISCUSSION

According to the results of the accuracy of the algorithms, it is seen that the highest accuracy values of all algorithms have been shown to predict the students' science levels. This can be interpreted as having more patterns related to science levels in students' responses to questionnaire questions. On the other hand, the lowest accuracy values in all algorithms were found in predicting the mathematical level. This means that there are fewer patterns in predicting students' mathematics levels than

in other areas. The accuracy values of algorithms in predicting science, mathematics and reading levels are shown comparatively in Figure 2.

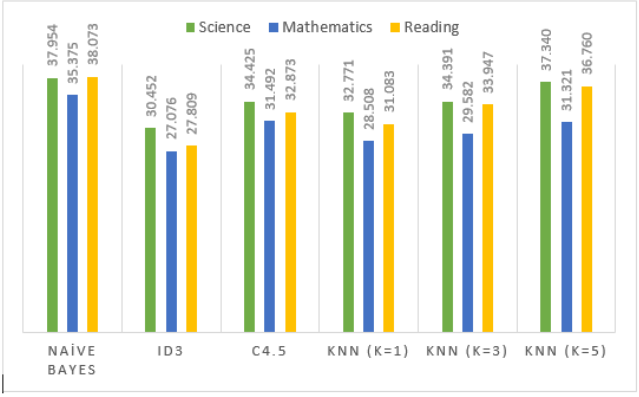

Figure 2. *The Comparative Graph of Accuracy Values of Algorithms According to Science, Mathematics and Reading Levels*

In the dataset, finding out why patterns for science are more and why the patterns for mathematics are less will provide a better understanding of the reasons affecting the students' achievements in these fields.

In the study, when the accuracy values of data mining algorithms are considered, it is seen that the Naive Bayes algorithm reaches the highest accuracy value in all three areas. The Naive Bayes algorithm works based on Bayes' theorem, which is one of the fundamental theorems of probability theory. The disadvantage of the Naive Bayes algorithm is the assumption that each feature is independent of one another and does not affect each other. Nevertheless, Naive Bayes is a fast algorithm and is used frequently in many data mining or machine learning tasks. In addition to the accuracy performance, the Naive Bayes algorithm showed the best performance in terms of the result time. As a result, in this study, the Naive Bayes algorithm performed quite well compared to other algorithms.

Thus, in this study, It has been proven that the Naive Bayes algorithm can give good results on the educational data compared to other algorithms and can be preferred for such tasks.

In the analyses conducted to calculate the Information Gain of the questionnaire questions, it is seen that *"PROGN-Unique national study programme code"* has the highest Information Gain value in all of the science, mathematics and reading levels. In the literature, the relationship between student achievement and school types in Turkey were examined in several studies. In a study conducted by Cansız, Ozbaylanlı & Çolakoğlu (2019), it is shown that the type of school in Turkey has a high impact on student achievement. Eser, Güzeller & Aksu (2016) found that there was a significant difference between high school type and university students' academic achievement and critical thinking. Considering the studies on PISA data, in a study conducted by Berberoğlu & Kalender (2005) by using PISA 2003 data, it was determined that the students' levels of achievement vary according to school types rather than regional differences. In a study conducted by Özkan (2015) using PISA 2012 data, it was found that the variable is having the highest effect on predicting students' success was the school climate variable. The finding that the type of school presented in this study has the highest Information Gain for students' prediction of science, mathematics and reading levels supports the results found by other studies. A more in-depth study of how school types have an impact on students' success, or what schools aspects have played a role in student achievement, may also be a subject of a study.

One of the questionnaire questions, which gives the highest Information Gain value in all of the science, mathematics and reading levels, is the "ST111Q01TA-*How many books are there in your home?"* question. This ques-

tion also ranks second after the *"PROGN-Unique national study programme code"* to predict the reading proficiency level. According to a study by Türkan, Üner, & Alcı (2015), it was examined whether the students' mathematics achievement in the PISA 2012 test differs according to the number of books in their homes.

The results of the study showed that if the number of books in the students' homes was high the success of the students was generally high. In terms of data mining, it is seen by this study that the number of books in the students' houses is among the questionnaire questions that have high Information Gain values. This means that the patterns or unique values in this question are more than the others. In this respect, this study shows the relationship between a number of books and student success using data mining algorithms.

As a result, it is possible to say that the data mining analysis on the PISA 2015 Turkey data performed in this study was in parallel with the results of the studies using the different methods. At the same time, this study is an example of the use of data mining, a sub-branch of artificial intelligence, on educational data. As a result of computerization, digital data is increasing. Discovering useful information by analyzing this data is also necessary for education as for each area. It is a fact that the approaches based on data also contribute to making learning more effective, one of the fundamental objectives of education.

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THE RELATIONSHIP BETWEEN INTERPERSONAL AND INTRAPERSONAL INTELLIGENCES OF THE TURKISH UNIVERSITY STUDENTS AND THEIR SENSE OF HUMOR

CHAPTER 6

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INTRODUCTION

Humor originates from a Latin term referring to one of the four fluids of the body (blood, phlegm, choler, and bile), the balance between which was thought to determine sound health. A person with a good balance, i.e., health, was said to be in good humor. Later, during the Renaissance period, humor came to refer to one's mental stability. It is only in the modern era that humor has begun to refer to an aspect of one's personality (Billig, 2005). In the modern sense, most dictionaries are unanimous in considering humor as synonymous with fun, laughter and amusements or, with the ability to induce, perceive, or enjoy fun, laughter or amusements.

Among researchers, however, there is a greater level of variation in how humor is defined in classroom studies. Wanzer, Frymier, Wojtaszczyk and Smith (2006) define humor as "anything that the teacher and/or students find funny or amusing" (p. 182). Tuncay (2007) defines humor as "understanding not only the language and words but their use, meaning, subtle nuances, the underlying culture, implications and unwritten messages" (p. 2). While most of this 'understanding' is required for success in other aspects of language learning as well, the 'underlying culture' clearly adds another level of complication to humor, particularly when a language other than one's mother tongue is involved.

Rather than offer their own definitions, some authors work from dictionary definitions (Bruner, 2002; Garner, 2006). This may be considered a safe option. However, as others have indicated, there is much variation in the creation and appreciation of humor, since humor can be universal, culture-bound, or idiosyncratic (Bell, 2009; Medgyes, 2002; Schmitz, 2002). What is humorous to one in a particular time and setting may turn out to be incom-

prehensible, inappropriate, or even offensive to another in a different context. Therefore, a dictionary definition may not suffice for all instances of humor in a certain study.

As the concept of humor has an abundance of definitions, it is first important to establish the definition which has been used in this study. For our purposes, humor has been defined as a teacher/student-initiated attempt to stimulate laughter or amusement. Such attempts may be drawn from the materials, the lesson content, or classroom interactions (e.g. student actions, or student responses to teachers' questions), and will typically result in laughter or amusement.

In the field of English language teaching, the use of humor either as a teaching or a learning tool seems noteworthy as it reduces the anxiety of the learners and increases their motivation. Researchers in the field conducted numerous studies investigating the relationship between humor styles and numerous variables (e.g., Ford, McCreight, & Richardson, 2014; Schermer et al., 2013; Veselka, Schermer, Martin, & Vernon, 2010; Vrabel, Zeigler-Hill, & Shango, 2016). The results of the studies indicated that humor styles had correlation with personality (Martin et al., 2012; Schermer et al., 2013; Veselka et al., 2010) depressive symptoms, life satisfaction (Dyck and Holtzman, 2013; Tucker et al., 2013).

Although a bulk of research has been conducted on employing humor as a tool in teaching English, studies on the link between learners' personality traits and their humor are scarce. For this reason, this study aims to contribute to the field by presenting a case in Turkish context by investigating the associations between interpersonal and intrapersonal intelligences of the students and their use of humor styles in the classroom with a look at their ages and gender.

Review of Literature

A plethora of studies conducted to investigate the pedagogical implications and invaluable effects of using humor in language teaching underline the benefits gained from the use of humor (e.g., Berk, 1998; Dornyei, 2001; Garner, 2003, 2006; Huy Hoang and Petraki, 2006). Some benefits of using humor in the classroom are creating instructional effectiveness (Medgyes, 2002; Wanzer, 2002), sensitizing students to phonological, morphological, lexical, and syntactic differences within a single language or between a student's mother tongue and target language (Deneire, 1995), paving the way for an enjoyable and more relaxed classroom environment (Kher, Molstad, & Donahue, 1999; Neuliep, 1991), accelerating student learning (Baringer & McCroskey, 2000), contributing to the learner's linguistic and sociolinguistic development (Bell, 2009), providing a deeper processing of lexical items (Bell, 2005), reducing tension (Berk, 2000), improving the learning climate, maximizing student-teacher rapport, facilitating learning (Stopsky,1992), and boosting self-confidence and success (Pollack & Freda, 1997). Based on the results of these studies, language teachers are recommended to integrate humor in their materials (Aboudan, 2009). Added to that, students also indicate positive attitudes toward the use of humor in language classrooms (Barnes & Lock, 2010), stating that humor builds up their concentration and interest while combatting boredom and helps them cope with learning challenging materials (Askildon, 2005).

Among the first empirical studies arguing in favor of the benefits of humor in teaching process comes Ziv's (1988) study examining the test results of two groups of undergraduate students taught by one teacher using relevant humor and one not using humor. According to the results, the group learning with humor achieved higher test results. Garner's (2006) study revealed that the partic-

ipants in the humor group generally rated the lesson higher, recalled and retained more information regarding the topic. Huy Hoang and Petraki (2016) examined the use of humor in the Asian language classroom, with results confirming that humor played a significant role in the classroom. Over 76% (23 out of 30) of teachers participating in their study made explicit attempts to use humor while the remaining seven teachers claimed during the interviews that they used humor in their teaching, at least occasionally, depending on the context.

To investigate the perceived benefits of humor within the language classroom, Askildson (2005) asked a number of language students and teachers to evaluate the use of humor in their classrooms. Results from his pilot-study strongly confirm a perceived effectiveness for humor as an aid to learning and instruction. Investigating this from the students' own perspective, Rachel Abraham, et al. (2014) found that nearly all students (n = 157; 97.5%) regarded humor incorporated appropriately in classroom as beneficial and useful in terms of retention of the topic (n = 141; 75.15%). Most of the students (n = 158; 98.12%) agreed that use of humor in classroom teaching paved the way for a good teacher-student relationship. Most (n = 146; 90.67%) also regarded a good sense of humor as an attribute of an effective teacher.

In another study, Piaw (2012) investigated the effects of using humorous content-based cartoons in learning materials to improve students' reading rate, comprehension and motivation. He concluded that such additions to course material contributed to an improvement in the rates, comprehension and motivation of reading among students. The findings reveal that the pictures used student enhanced contentment in approaching complicated ideas in the reading material, increased the challenge in a way

which strengthened efficacy and boosted curiosity and involvement.

The use of humor can also instill ease, especially in anxiety-prone environments and help reduce the power differential between students and staff (Baid & Lambert, 2010). Regarding the effects of teacher sense of humor on students' intrinsic motivation, Punyanunt (1997) states that if the students appreciate their teacher's sense of humor in the class, they are more intrinsically motivated to follow instructions, and have a greater perception of the teacher's power. From this, it can be drawn that humor intensifies the relationship between teacher and student. The results of this in classes in which students need to be free and relaxed to express ideas and discuss topics are greatly significant. For example, in reading classes where students are provided with some texts to read, analyze, and comprehend, student's engagement in discussions and activities may lead to better outcomes. Blyth and Ohyama (2011) investigated the effects of using humor in English as a foreign language (EFL) classroom by taking data from first-year students in two universities. Results indicated a link to students' achievement in vocabulary and language awareness. In a study by Yip and Martin (2005), the associations among sense of humor, emotional intelligence and social competence were examined. The participants of the study were 111 undergraduate students. It was concluded in the study that emotional management ability was positively correlated with self-enhancing humor and cheerfulness while it was negatively correlated with bad mood. In addition, positive humor styles and cheerfulness were positively correlated with some domains of social competence. In his study, Pham (2014) investigated university students' perceptions pertaining to use of humor in EFL context. The findings of the study revealed that the majority of the participants had positive views about the use of humor in EFL teaching. In another study by Akinkurolere

(2013), ESL students' perceptions about the use of humor in the language classroom were explored. It was concluded in the study that the participants of the study held both positive and negative views on the use of humor in the teaching of English as a second language. The findings of the study also revealed that for the participants of the study humor was related to culture. Safa and Ghonchehpour (2017) searched into whether humor instruction could lead to EFL learners' ability to comprehend, recognize and appreciate humor. The results of the study indicated that such an instruction could significantly affect learners' comprehension, recognition and appreciation of humor.

Classification of Humor types

In an attempt to develop a measure that would take into account different functions of humor, rather than particular personalities, Martin, Puhlik-Doris, Larsen, Gray and Weir (2003) developed The Humor Styles Questionnaire (HSQ). According to Martin *et al.* (2003), the HSQ is not viewed as a comprehensive measure of all components of sense of humor mentioned earlier, but rather it focuses on the interpersonal and intrapsychic functions that humor is made to serve by individuals in their everyday lives, and particularly those functions that are considered most relevant to psychosocial well-being. By assessing each of these functions of humor, we expect that these scales, taken together, may account for a greater proportion of the variance in various aspects of mental health and well-being than do previous self-report humor scales. The HSQ designed by Martin et al. (2003) consists of 32 items and focuses on the development and initial validation of a new multidimensional measure and assesses four dimensions relating to individual differences in uses of humor: affiliative, self-enhancing, aggressive, and self-defeating. Two of these dimensions (Self-enhancing and affiliative) are conducive to psychosocial well-being, while the other two

dimensions (aggressive and self-defeating) are hypothesized less gracious and potentially even detrimental to well-being. These four specific humor styles identified by Martin et al. (2003) are elaborated as follows:

Affiliative humor

Affiliative humor refers to benign interpersonal attempts to enhance one's social relationships with others based on amusing talk, jokes and witty banter to amuse others. This type of humor is benignly adopted to reinforce relationships as well as enhance group cohesion without being malicious to oneself or others. For example, individuals may engage in humorous anecdotes or languages to relieve tension, put others at ease, amuse them, or tighten bonds. This style of humor is thus "essentially non-hostile, tolerant use of humor that is affirming of self and others and presumably enhances interpersonal cohesiveness and attraction" and is expected relate to "extraversion, cheerfulness, self-esteem, intimacy, relationship satisfaction, and predominantly positive moods and emotions" (Martin, et al., 2003, p. 7).

Self-enhancing humor

Self-enhancing humor is another form which aims to enhance the self. It "involves a generally humorous outlook on life, a tendency to be frequently amused by the incongruities of life, and to maintain a humorous perspective even in the face of stress or of adversity" (Martin, et al*.,* 2003, p. 53). It is a use of humor as functions in the Freudian sense – a coping mechanism to make individual feel better about themselves which can be used to cope with negative or destructive emotions drawn from stressful or tense situations (Kuiper, Martin, & Olinger, 1993). In comparison to affiliative humor, as Martin, et al. (2003, p.8) underline, self-enhancing use of humor "has a more

intrapsychic than interpersonal focus, and is therefore not expected to be as strongly related to extraversion". Given the focus on the regulation of negative emotion through humorous perspective-taking, this dimension is hypothesized to be negatively related to negative emotions such as depression and anxiety and, more generally, to neuroticism, and positively related to openness to experience, self-esteem, and psychological well-being.

Aggressive humor

Aggressive humor relates to the use of sarcasm, teasing, ridicule, derision, or put-downs to disparage others (Zillman, 1983). It also includes the use of humor to manipulate others by means of implied threat of ridicule (Janes & Olson, 2000). In general, it relates to the tendency to express humor without regard for its potential impact on others (sexist or racist humor falls into this category) and includes compulsive expressions of humor in which one finds it difficult to resist the impulse to say funny things that are likely to hurt or alienate others. This type is expected to correlate with neuroticism, hostility, anger, and aggression, and negatively related to relationship satisfaction, agreeableness, and conscientiousness.

Self-defeating humor

The application of self-defeating humor is employed to belittle oneself and may be used by an individual to belittle their own intelligence with the intention of receiving the approval of others. While this may result in pleasing others such approval comes with a price. The individual may laugh along with others when being ridiculed or disparaged, but this style is hypothesized as relating to "neuroticism and negative emotions such as depression and anxiety, and negatively related to relationship satisfaction, psychological well-being, and self-esteem" (Martin, et al.,

2003, p. 8). In terms of the classroom, although individuals who are high on this humor dimension may be seen as quite witty or amusing (e.g., ‘‘class clowns’’), there is an underlying element of emotional neediness, avoidance, and low self-esteem (Fabrizi & Pollio, 1987).

In studies conducted by a group of scholars (e.g., Martin, et al*.,* 2003; Saraglou & Scariot, 2002), both affiliative and self-enhancing humor styles were reported to correlate positively with intimacy, extraversion and openness to experience. Meanwhile, the ones with high affiliative and self-enhancing humor were shown to be high in intimacy, extraversion, openness to experience and low anxiety. Aggressive humor, as aforementioned, is the tendency to use humor to attack or put others down, and typically involves sarcasm, teasing, ridicule, derision, hostility, or disparagement humor. The ones with the strongest tendency to use aggressive humor style were indicated to be high in hostility and low in agreeableness (Martin, et al*.,* 2003; Saraglou & Scariot, 2002). A group of scholars have conducted studies on self-defeating humor styles and its effect on the individuals. The studies are generally in concurrence that the ones with high self-defeating humor tend to be high in shyness (Hampes, 2006), loneliness (Martin & Dutrizac, 2004; Hampes, 2005), anxious attachment (Kazarian & Martin, 2004) and anxiety (Martin, et al., 2003), and low in intimacy and satisfaction from social groups (Martin, et al., 2003).

The studies conducted in the Turkish context where the current study was carried out also investigated the correlation between humor styles and various variables. In one of the studies conducted by Bilge and Saltuk (2007), Turkish college students’ subjective well-beings, trait anger and trait anxiety based on their humor styles were investigated. Their results indicated that the subjective well-beings of participants who preferred affiliative and self-enhancing humor styles were higher. In contrast, they also ob-

tained lower trait angry and anxiety scores. The results also indicated that the trait anger scores of the participants adopting aggressive humor styles were higher, while their subjective well-being scores were lower. The trait anxiety of the participants preferring self-defeating humor style appeared to be higher. In addition, socio demographic variables, loneliness, self-esteem and their relation to humor styles were investigated in the studies carried out by Tumkaya (2011), Cecen (2007), and Ozyesil (2012). In Tumkaya's (2011) study, the use of aggressive and self-defeating humors were reported to be significantly greater in male students than female students. In contrast, the use of affiliative and self-enhancing humors was not found to be significantly different between the two groups of the participants. Moreover, in Cecen's (2007) study, it was found out that there were strong negative correlations between loneliness and affiliative and self-enhancing humor styles, and moderate positive correlations between loneliness and self-defeating humor style. In Ozyesil's (2012) study, self-esteem was reported to be positively correlated with positive affection, while self-esteem was found to be negatively correlated with negative affect.

Interpersonal and Intrapersonal Intelligence

In his theory of multiple intelligences (MI), Gardner (1993) sought to broaden the scope of human potential beyond the confines of the intelligence quotient (IQ) score. The theory of MI provides a view which constitutes a variant to the traditional intelligence assessments utilized by school psychologists for nearly a hundred years. He questioned the validity of determining intelligence by removing individuals from their natural learning environment and asking them to perform unfamiliar, isolated tasks. Instead, Gardner suggested that intelligence ought to be rather more related to the capacity for (1) solving problems and (2) fashioning products in a context-rich and naturalistic

setting. In his work *Frames of Mind*, Gardner (1993) identified at least seven basic intelligences, with the addition of a further eighth since (Gardner, 1999). With this broader and more pragmatic perspective considered, the concept of intelligence began to lose its mystique and became a functional concept that could be seen working in people's lives in a variety of ways. Gardner groups human capabilities into the following eight comprehensive categories or "intelligences": linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic. Gardner (1993) points out that each intelligence is actually a "fiction"; that is, no intelligence exists by itself in life (except perhaps in very rare instances in savants and brain-injured individuals).

While many of these intelligences can be incorporated into the higher education classroom, interpersonal and intrapersonal intelligences play an undeniable role in interactions between teacher and students. Armstrong (2009) in his book, *Multiple Intelligences in the Classroom*, describes interpersonal intelligence as the ability to perceive and make distinctions in the moods, intentions, motivations, and feelings of other people. This can include sensitivity to facial expressions, voice, and gestures; the capacity for discriminating among many kinds of interpersonal cues; and the ability to respond effectively to those cues in some pragmatic way (e.g., to influence a group of people to follow a certain line of action). On the other hand, intrapersonal intelligence is defined as self-knowledge and the ability to act adaptively based on that knowledge. This intelligence includes having an accurate picture of oneself (one's strengths and limitations); awareness of inner moods, intentions, motivations, temperaments, and desires; and the capacity for self-discipline, self-understanding, and self-esteem. Mayer (2008) refers to these two types of intelligence as 'personal intelligence' which he believes is worth studying in context of language learning.

Pishghadam (2009b) differentiates between the interpersonal and intrapersonal intelligences, claiming that intrapersonal intelligence accounts for one's own feelings and emotions. In contrast, the interpersonal intelligence helps someone understand others' desires, feelings, and intentions. He regards emotional intelligence as the integration of interpersonal and intrapersonal intelligences, concluding that higher intrapersonal intelligence can be of greater benefit to language classes. In another study, Pishghadam (2009a) examined the effect of intrapersonal and verbal intelligences in language learning, concluding that intrapersonal intelligence increases productive skills while verbal intelligence strengthens communicative skills.

Despite numerous studies on employing humor as a tool in teaching English in different parts of the world, studies on the humor styles of Turkish university students with a focus on their intelligence profile as a personality trait are scarce. Studies which have made enquiries about humor styles in the classoom are limited to areas such as primary school teaching, early childhood education, or psychological counseling and guidance in Turkey (Altinkurt & Yilmaz, 2011; Aydin, 2015; Tras, Arslan, & Tas, 2011). Considering that the personality traits of students might play a significant role in determining the appropriate humor style in the classroom, this study attempted to bridge the gap in exploring the humor styles of Turkish university students in Turkish context.

METHOD

The present study sought to investigate the associations between interpersonal and intrapersonal intelligences of the participating students and their use of humor styles in the classroom with a look at their ages and gender. The goal, however, was to increase teachers' awareness of these issues so that they can use their sense of humor for the best

meaning. As to provide some in-depth perspectives on the students' humor styles and their interpersonal and intrapersonal intelligence profiles, this study examines (1) whether there is a difference between male and female learners with regard to employing the humor styles, (2) whether the age of the learners is an influential factor in adopting the humor styles, and (3) if there is an association between interpersonal and/or intrapersonal intelligences of the students and their use of affiliative, self-enhancing, aggressive, and self-defeating humor styles in the classroom.

Participants

The participants of the study were 19 male and 36 female Turkish university students studying in the English language teaching department of a private university in Turkey. The participants were between the ages 16 and 36. All the participants had completed English preparatory program of the university when data were collected. They were chosen with convenience sampling and all the participants were volunteers for the present study. As Table 1 indicates, the highest percentage (65%) of the participants were ranging from 16-20 years old (N = 37), while the ones aging 31 to 36 years old were the lowest percentage of the participants (N = 7).

Instruments

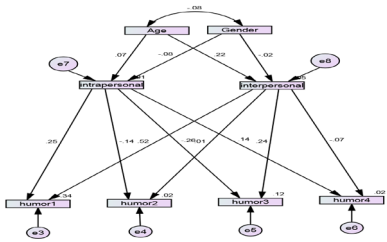
In this study, the data were collected using two questionnaires: The HSQ and Multiple Intelligences Survey. In order to explore the humor styles of the participating students, English version of The HSQ identified by Martin et al. (2003) was used as the data collection tool. In their study, the scale indicated adequate internal consistencies ranging from .77 to .81. A Turkish version was used, as developed by Yerlikaya in 2003. The Cronbach alpha coefficient scores of the questionnaire were reported to be

ranging from .67 to .78. Both English and Turkish versions were shared though an online questionnaire developing website (www.surveymonkey.com). The HSQ is a 32 item self-report scale and it assesses four styles of humor: affiliative, self-enhancing, aggressive, and self-defeating. The items in the questionnaire are structured in 7-point Likert scale format. The second used questionnaire developed by Armstrong (2009) administered to the participants to obtain their interpersonal and intrapersonal intelligence profiles. The questionnaire assessing the two intelligence profiles has 20 items.

Analyses and Results

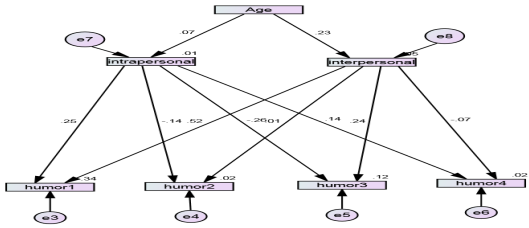
Since this study was a mediator analysis of three sets of variables (one set of independent variables and two sets of dependent variables), it was decided to use path analysis to estimate the magnitude and nature of the relations. The path analysis with two exogenous variables of age and gender was discarded because neither there was a significant covariance between the two variables nor the model fit indices were good enough. Figure 1 represents this model, but we will leave talking about it at this point.

Figure 1. *Path diagram with age and gender as exogenous variables*



To explore the relationships between variables with comparatively better models, two other path analyses were conducted with age and gender separately. Figure 2 represents the relationships between age and interpersonal and intrapersonal intelligences on the one hand and these two mediator variables and different styles of humor on the other. Humors 1 1, 2, 3, and 4 represent affiliative, self-enhancing, aggressive, and self-defeating humor styles, respectively.

Figure 2. *Path diagram with age as the exogenous variable*



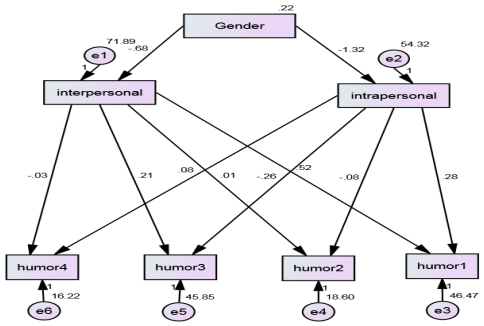
The patterns of relationships and regression weights are given in Table 1. As can be seen, significant path coefficients exit between affiliative and aggressive humor styles and intrapersonal intelligence with p=.022 and p=.037, respectively. But the strongest relationship was found between interpersonal and affiliative humor (p<.001). The important model fit indices for this path analysis were Chi-square = 22.638, CMIN = 22.638, NFI = 22.638, RMSEA = .137, and CFI =.698.

Table 1. *Regression Weights for Age, Intelligence and Humor: (group number 2 - default model)*

			Estimate	S.E.	C.R.	P
Interpersonal	<---	Age	1.980	1.143	1.733	.083
Intrapersonal	<---	Age	.569	1.020	.558	.577
humour1	<---	intrapersonal	.282	.123	2.286	.022
humour4	<---	intrapersonal	.079	.073	1.088	.276
humour1	<---	interpersonal	.519	.107	4.829	***
humour2	<---	interpersonal	.006	.068	.095	.924
humour3	<---	interpersonal	.205	.107	1.926	.054
humour4	<---	interpersonal	-.032	.063	-.511	.609
humour2	<---	intrapersonal	-.085	.078	-1.086	.278
humour3	<---	intrapersonal	-.256	.122	-2.090	.037

The path analysis for gender is given in Figure 3.

Figure 3. *Path diagram for gender as exogenous variable*



The table for the relationships in the output of path analysis for gender indicates significant regression weights between affiliative and aggressive humor styles and intrapersonal intelligence, p=.022 and p=.037, respectively. The strongest association, however, was found between affiliative humor and interpersonal intelligence, p<.001. These probability values are the same as the probability values

calculated for age as the exogenous variable and this is no surprise because there was almost no covariance between gender and age and the analyses were driven from the same data. The important indices for this model were Chi-square = 28.708, CMIN = 28.708, NFI =.543, RMSEA = .170, and CFI =.577.

Table 2. *Regression Weights for Age, Intelligence and Humor: (group number 2 - default model)*

			Estimate	S.E.	C.R.	P
interpersonal	<---	Gender	-.684	2.404	-.285	.776
intrapersonal	<---	Gender	-1.316	2.089	-.630	.529
humour4	<---	Interpersonal	-.032	.063	-.511	.609
humour3	<---	Interpersonal	.205	.107	1.926	.054
humour2	<---	Interpersonal	.006	.068	.095	.924
humour1	<---	Interpersonal	.519	.107	4.830	***
humour4	<---	Intrapersonal	.079	.073	1.088	.276
humour3	<---	Intrapersonal	-.256	.122	-2.091	.037
humour2	<---	Intrapersonal	-.085	.078	-1.086	.277
humour1	<---	Intrapersonal	.282	.123	2.286	.022

We did not use saturated models in this study, so the models used were not perfect as indicated by the relatively high Chi-square values. However, it should be kept in mind that we have used an exploratory model for confirmatory purposes. Had we eliminated the non-correlating variables, the models fit would have been much better.

DISCUSSION AND CONCLUSION

The purpose of this study was to deal with associations between interpersonal and intrapersonal intelligences of the participating students and their use of humor styles in the classroom with a look at their ages and gender. The study posits humor as a valuable tool for language learning and teaching, which, as Garner (2005, p. 1) states, "is most effective when it is appropriate to the audience, targeted to the topic, and placed in the context of the learning experience". The study yielded noteworthy findings that could

be used by language teachers in integrating humor into their teaching. The two path analyses conducted with gender and age as exogenous variables and intelligences and humor styles as the two levels of the endogenous variables respectively showed very significant path coefficients ($p<.001$ in both analyses) between interpersonal intelligence and affiliative humor. Significant path coefficients were also found for intrapersonal intelligence and affiliative humor ($p=.022$), and intrapersonal intelligence and aggressive humor ($p=.037$) associations. The relationships between age and gender and the two types of intelligences studied were non-significant.

One of the findings of the present study was the significant relationship between age and interpersonal intelligence which has a strong positive relationship with affiliative humor style. Another significant finding of the study yielded that age was not a determining factor pertaining to the relationship between intrapersonal intelligence and humor types. The last but not the least, it was concluded in the study that gender is not strongly related neither to inter- nor to intra-personal intelligence. It could be concluded that it is the intelligence type that predicts the kind of humor which is excitatory and encouraging to the students.

In this study, the direct relationships between age and gender and different humor types were ignored and only their indirect relationships through the intermediary of inter- and intra-personal intelligences were measured. The inclusion of direct relationships was avoided because investigating these relationships was not the purpose of this study. Also, their inclusion could have made the models very complex. It is obvious that a question addressing these relationships is also worthy of investigation. It should be remembered, however, that these relationships are not perfect meaning that the huge amount of variance

might be explicable by factors other than the variables investigated in this study.

It is believed that the use of humor is somehow linked to students' learning in numerous fields of education including foreign language teaching. Many studies have been conducted either on how to integrate humor in language teaching or humor types used by language teachers. However, students' humor types and the variables such as personality traits that the humor types are linked to seem to be scarcely taken into consideration in the field of language teaching. Taking this into account, the present study investigated interpersonal and intrapersonal intelligences of the university students and their sense of humor. The findings of the study imply that language teachers should first be aware of humor types of their students so as to integrate humor in the most appropriate ways into their lessons. It should be within the responsibility of language teachers to uncover their students' humor types and equip themselves with necessary knowledge on each type of humor and the related variables to be able to reach utmost outcome.

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SCENARIOS FOR SCHOOLS OF THE FUTURE IN TURKEY

CHAPTER 7

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INTRODUCTION

Today's people are all aware of the living conditions and ways of the society changed deeply. A dramatic technological revolution has happened and the process is still going on. Change in everywhere in the globe is happening rapidly and people have a bit of idea about what our world will transform into for decades but far less than fifty years. Today, the life out of school is changing faster than ever before. Speed of innovation in the world to get harder to foresee the precious skills and knowledge for the future. For this reason, there is a keen need for futuristic studies in the field of education to gather information for consistent plans and policies. Some sectors like business and health care adapted rapidly to spirit of time (zeitgeist) but some have been still struggling. Futures studies has drawn less attention than other fields including energy, environment, and transportation even if school is mostly essential for human development and so innovations which are also necessary for those sectors. Future studies in education supports the change management in school administration, including the recognition of its momentums.

This analogy can clarify the level of future oriented strategies in Education. Let us assume that a doctor from one century ago came to a hospital of 2018. It is not possible him to understand USG, MR, PET-CT scan or reports of the devices which became an integral part of everyday life in medical diagnosis. On the other hand a teacher from a century ago adapt easily to a classroom because, very little change occurred in learning environments and manners. This example lead me to think about finding the ways to support improvement of education. A researcher can find many ways to inquire a concept and futures study methods are one of them. Despite the blurriness of tomorrow, every day we have to make decisions for the future and future is determined by the choices that are made in today.

Futures studies in education have potential to, across the ocean of wavy attitudes and behaviors, futuristics can act as a vessel traveling stabilized just with a small range of necessary maneuvers but without drifting off the long-run route a lot. Why will public sector make allocations and provide labor in return for the fruits to be harvested years after? If we overlook the long term sensitivity analysis, we cannot have an effective response to our twisting environment on shaky ground, which deteriorates with increasing interests and stakes specifically on the educational institutionalization.

METHOD

The purpose of the study is to explore possible schools of the future scenarios in Turkey by 2050. Futures studies methods have a number of methods so that we can have a brighter look-ahead and generate alternate ways that may help us decide on what actions to be taken in order to shape our future, such below: Technology foresight method, Scanning technique, Extrapolation method, Scenario analysis and Delphi survey. As an advantage, we can selectively blend these methods to adopt a portfolio mindset very customized to apply for each situation (Witt and Orvis, 2010).

The present study uses scenario analysis as a method to discover expectations for schools in future. At first stage in the research, "Schools of the future" concept defined as any possible educational institutions that emerge in the future based on current trends. These institutions may exist in traditional school form or less structured forms. With these intentions, the following research question is formulated: What are the possible scenarios for the future K-8 schools in Turkey?

Results of this question have significance to provide alternative pathways for schools and evidence for long-term policy making for the future in the field of education. Here, the scenario is fictionalized based on the ground of

causality, consistency, coherence, and/or description, including realistic scenes with simulations, rather than forecasting the future. Futuristics unanimously defines this as the real scenario containing actions and events from the real world, which is designed from different angles with a linear approach to time from past to future, and potential contingencies in an action plan to get well prepared for any risks (van Notten, 2006, van der Heijden**,** 2002).

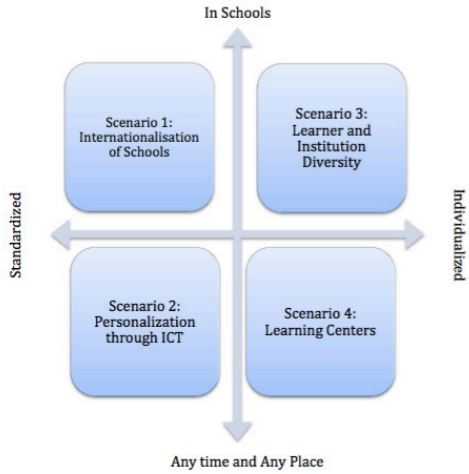

Figure 1: *Scenarios on Axis*

Design of the Study and Scenario Framework

The purpose of this study is to develop a set of internally consistent scenarios for the future schools in Turkey. Scenario creation includes many different steps and putting altogether the data gathered from previous studies (Tunalı& Kiraz, 2019; Tunalı& Kiraz 2017a; Tunalı& Kiraz 2017b). According to these studies, there are many trends shape education but results indicated that "Globalization and Technology (ICT)" are more influential trends among other trends. For this reason, scenario matrix is depending on these two trends. After determining scenario framework with themes and sub-

themes researcher come up with two-way matrix of scenario and Figure 1 represents four scenarios. Globalization Axis has two main components, the "Standardization" of curricula by international regulations and "Individualization" of curricula by giving more power to local authorities and learner. In Technology axis there are other two main directions that ICT use "In School" and ICT use "any time any place".

Dimensions of Scenarios

In this present study, created scenarios have the similar dimensions with OECD scenarios (OECD, 2001; OECD, 2006; OECD, 2010) these are described at the below.

1. Attitudes, expectations, political support: Public and private understanding of schooling, Political power backing up the education system, More valuable schools, their should-be roles in community, Social networks in culture and politics, Ethical behaviors in public, Pride and dignity of schools and teachers and Client satisfaction in schools.

2. Goals, functions, equity: Vision and mission of schools, More effective curriculums, general and specific, Identification of the accreditation criteria, Equipment of teaching areas, inside or outside school nad Perspective for educational impact.

3. Organizations and Structures: Transparency and accountability in public, Formality or non-formality in educational institutions and Public or private service-providers in education

4. The Geo-political Dimension: Micro-, mezzo-, and macro-level applications in global education system, Public governance in education, Main characteristics of delivery organizations and Adaptability to environmental forces and changes

Data Source and Participants

Scenario Creation process have two kind of data sources. Initial data derived from Trend Analysis (Tunalı& Kiraz, 2019; Tunalı& Kiraz 2017b) supplied relevant information for scenarios. Second, scenario interviews were conducted to elaborate on these hypothetical scenarios. Data collection from educational professionals was achieved through maximum variation sampling procedure. Furthermore, the teaching practitioners were one of the main sources of information on the transformation of policies to practice and the feedback of what and how students were taught to keep policy- and decision-makers updated on the latest developments. For the present study to obtain variation for sample 13 participants selected in the field of education from different majors as seen in Table (2).

Table 2: *Scenario Interview Participants*

# of Participants	Title	Gender	Major
Sce 1	Assistant Prof.	Female	Gifted Education
Sce 2	School Founder	Female	Business Administration
Sce 3	Prof	Male	Chemistry
Sce 4	Assistant Prof.	Female	Gifted Education
Sce 5	School Principal	Female	English Language
Sce 6	School Principal	Male	English Language
Sce 7	Assistant Prof.	Female	Curriculum and Instruction
Sce 8	School Principal	Female	Classroom Teacher
Sce 9	Prof	Male	Instructional Technology
Sce 10	Assistant Prof.	Male	Educational Administration
Sce 11	Assistant Prof.	Female	Curriculum and Instruction
Sce 12	Prof	Male	Educational Administration
Sce 13	School Founder	Male	Computer Engineer

Data Collection Procedure and Instruments

Bogdan and Biklen (1992) indicate that interviews aim to gather data from participants' own words in order to develop insights on how they interpret a situation. Similarly, Cohen, Manion and Morrison (2000) maintain that interviews enable participants to discuss an issue from their own point and to indicate their attitudes, beliefs and opinions. Although interviews consider as subjective when compared to questionnaires it allows for a deeper understanding and analysis of a case, and have a higher response rate (Esterberg, 2002). These points are highly important in the Scenario Interviews of this study because the aim is to lead variety of experts put their comments on scenario framework.

During interviews researcher mentioned the framework of each and every scenario respectively and take comments of participants. For the aim of scenario creation an interview schedule was composed. In this tool there are short scenario narratives that represents the main ideas and possible implementation in education for each scenario. These questions were aimed to enable participants to obtain a discussion on given scenario case, refer back to their experiences, share their feelings, elaborate on dimensions of scenarios and contrast different aspects of the each case. Researcher role is not a passive receiver of responses in these interviews she needed to debate on cases sometimes to encourage participant be more creative since, scenario interviews are based on hypothetic situations and these are not meet any ones expertise directly.

Data Analysis

For all interviews researcher captured voice memos on her smartphone during interview and transform the voice of a single speaker into written words. For this process *"Dragon Dictate"* program was used to convert speech to text. Dictating to the computer allows users to write their ideas freely as

they think. This program allows placing the ideas in the correct order by moving text, copying, pasting, cutting, deleting and inserting tables, images and other elements. All recorded interviews were transcribed by the researcher herself.

The transcribed interviews were analyzed by the way of content analysis. The main purpose of content analysis is to reach the concepts and relations, which will indicate the data collected. Moreover, content analysis involves conceptualizing the data, then organizing them according to those concepts and determining the themes (Mason, 2002; Patton, 2002; Strauss & Corbin, 1990). Provisional coding (pre-defined) was used for analysis procedure for "Scenario Creation". Because scenario frames that come out by the previous data (Tunalı& Kiraz, 2019; Tunalı & Kiraz, 2017b) and OECD Scenario dimensions and there is an intention to obtain consistency and relevancy between OECD scenarios and the present scenarios.

Trustworthiness

Because of the Scenario method is very flexible, researchers have to put great effort to make their studies valid and reliable. The trustworthiness of qualitative research generally is often questioned by positivist paradigm, for reason of their concepts of validity and reliability cannot be addressed in the same way in naturalistic study (Shenton, 2004). Guba (1981) proposes four criteria that should be considered by qualitative researchers in pursuit of a trustworthy study. These are Credibility, Transferability, Dependability and Confirmability of the study**.**

Credibility (Internal Validity)

Credibility refers to confidence in the truth of the findings in qualitative research. There are many procedures that explained at the below followed by researcher to increase credibility of this present study.

Prolonged Engagement and Persistent Observation: To this attempt researcher stayed in touch with participants and go back and forward through participants and participants own interviews. Moreover, researcher intentionally spent long time for research on schools of the future before scenario creation.

Triangulation: Triangulation involves using multiple data sources in an investigation to produce understanding (Lincoln & Guba, 1985). Denzin (1978) and Patton (2002) identify four types of triangulation and the implications of them presented at the below:

1. **Methods triangulation:** This method indicated checking out the consistency of findings generated by different data collection methods and in this study observation, interview and desk research was used for the sake of method triangulation. Using this method provide elucidate complementary aspects of the same phenomenon.

2. **Triangulation of data sources:** This method requires examining the consistency of different data sources from within the same method. Aiming this, researcher collected data over a prolonged period and from a wide range of participants.

3. **Analyst Triangulation:** Using multiple analysts to review study (findings, design etc.) or using multiple observers and analysts is the essence of this method. In the present study researcher strengthened her research design and arguments in the light of the comments made by experts and colleagues.

4. **Theory/perspective triangulation:** Using multiple theoretical perspectives to examine and interpret the data is not a case for this study because the aim of the study is not based on a theoretical framework.

Peer debriefing: Lincoln and Guba (1985) stated "It is a process of exposing oneself to a disinterested peer in a manner paralleling an analytical session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer's mind" (p. 308). Especially in setting interview questions, interview codes and data analysis, and writing scenario narratives required experts to review process.

Referential adequacy: ***T****his refers identifying a portion of data to be archived, but not analyzed. The researcher then conducts the data analysis on the remaining data and develops preliminary findings. The researcher then returns to this archived data and analyzes it as a way to test the validity of his or her findings (Lincoln & Guba, 1985).*

Member Checks: This is a process when data, analytic categories, interpretations and conclusions are tested with members of those groups from whom the data were originally obtained (Lincoln and Guba, 1985). As far as participants approved to do check interview transcriptions sent and obtained feedback of participants.

Transferability (External Validity/Generalizability)

Transferability procedure considers showing that the findings have applicability in other contexts. The responsibility of the investigator to ensure that sufficient contextual information about the fieldwork sites is provided to enable the reader to make such a transfer (Lincoln and Guba, 1985).

Thick description: Thick description is mentioned by Lincoln and Guba (1985) as a procedure of achieving a type of external validity. By describing a phenomenon in detail another one can evaluate the extent to which the conclusions drawn are transferable to other times, settings,

situations, and people. For transferability, researcher put enough detail according to study procedure.

Dependability (Internal Reliability)

To follow this procedure inquiry audit technique is used to double check whether the process is clear enough to other researchers or readers.

Inquiry audit: Audits examine both the process and product of the research study. The purpose is to evaluate the accuracy and evaluate whether or not the findings, interpretations and conclusions are supported by the data. In this study one Professor in the field of education was examined the research as inquiry audit. Researcher regularly met with him to interpretation of data.

Confirmability (External Reliability)

For this study, researcher demand peer review for qualitative study methodology, development of interview schedule, determining interview codes and data analysis process from four colleagues that have Ph.D. degrees.

RESULTS AND DISCUSSIONS

Trends analysis results from previous study (Tunalı& Kiraz, 2019) indicated that there are two main trends for the future of schools in Turkey. These are Globalization and Technology. In the light of these trends scenario matrix was created and interviews used for elaborate on each scenario.

Results for Scenario 1

Question (1) Scenario 1 Framework: A hypothetical scenario framework has been presented to create Scenario 1. Scenario (1) In the frame; international educational standardization and the use of technology in schools will

be the most important trends. In this case, it can be considered that the investment to education technologies will have the most important place in schools' budgets. Students take their courses in classes that have supported the technological infrastructure and teachers are very knowledgeable about using the technology for lessons. The most important criterion for determining the quality of education is international exams (PISA, TIMMS, PEARLS etc.) and accreditations. The output of education from kindergarten is assured by international standards. Representation of schools is to educate students in knowledge and skills which is the requisite of global economy.

Attitudes, expectations, political support

All of the participants stated that, in order for Scenario 1 to emerge, firstly Turkey should analyze the results of the international examinations well. Turkey participated in the PISA exam held in 2003,2006,2009,2012, 2015 and achieved success under the OECD average. Turkey participated in the TIMMS examination in 1999, 2007, 2011 and 2015 and only participated in the PIRLS examination in 2001. When we analyze the situation in general with the woven analysis, it can be said that it has been very successful in all examinations, as it has been repeated for many years. As stated in Scenario 1, if the most important criterion for the determination of the quality of education is international exams (PISA, TIMMS, PIRLSvb.), It is stated that the country should first analyze why it has achieved low success rate of inheritance and put the results into practice. The international benchmarking of countries is not a scientific data. Detailed reviews are needed for the development of educational interventions. It is a loss of prestige in the international arena when a country repeatedly shows low success in all exams. Nevertheless, the betting often results in passing the exam results to the media, which may lead to the development of universities, NGOs

and their families. In addition, international accreditations do not have a widespread and comprehensive international accreditation for K-12 schools while in high school.

The fundamental feature of Scenario 1 is the development of the workforce in the global economy and the competitiveness of the country. Both the interview results and the analysis of the tissues indicate that different skills are important in the global business life and that international institutions are effective in determining these skills. Organizations such as the Turkish Association of Industrialists and Businessmen (TUSIAD) are likely to have situation-related interventions. This is because each institution aims to have the highest possible quality of staff to hire in the future. As Sterling Bunnel said, "cheap man need expensive jigs" (as stated in Sennett, 2000). As a result, the Ministry of National Education, universities, families and business representatives can put pressure on this scenario.

It is stated that a foreign language will not be sufficient in schools because of the rapid increase of multinational companies in business life and the people working in these companies come from different languages and cultures. In addition to this result, it is necessary for schools to have tolerance and respect for the differences in the essentials from which they must be earned. As one of the participants stated: "*The colleagues of the students of this scenario will probably be an Indian or a Chinese in the future"* (Sce8, Female). In this case, people need more advanced communication skills and respect for diversity. If we think that the tension between the people who have lived in the same lands for centuries in many parts of the world today, not only in Turkey, but still far away, it is quite possible to consider this situation in order to be able to work in the same environment with the people of cultures.

For the second trend, the use of technology in school, which is necessary for the formation of Scenario 1; all of the participants noted that schools now understand the importance of investing in technology. Today, both public and private schools in Turkey support their classes and schools with their own technological infrastructure. While the proportion of schools that do education entirely with Tablet PCs is not very high, this is a fairly current issue of education. In addition to this, the use of the smart board is very common in private schools. Especially in 2012, with the "Increasing Opportunities and Technological Improvement Action Project" (FATIH), printers, infrastructure and high-speed internet access in every school; for classrooms: Interactive Board, wired / wireless internet connection. For teachers, it is planned to have a tablet computer, a cloud account, a Teacher software, a Learning management system (LMS), and for students: tablet computer, cloud account, student software. In 2017, 4 billion 444 million TL appropriation has been allocated to 256 projects for investing in Public IT technologies and the biggest share of this is reserved for education with 28%. "FATIH Project" has been the ICT project with the highest appropriation in 2017 with TL 1 billion (T.C. Ministry of Development Report, 2017). As a result, we can say that the trend in the use of technology in school is more dominant than the standardization trend of education.

Goals, functions, equity

As stated in the results of Turkey's 2007 TIMSS test, it is obligatory to keep the concept of equality in education on the tenth plan, which is the country where the education level is most affected by the socio-economic level. The most important point for Scenario 1 is to focus on high-level excellence and high equity. If higher standards are introduced and there is no intervention for equity, the

only difference today is that international standards will be introduced instead of national ones.

In Scenario 1, the most important question is: Can information from assessment of educational system, really influence education reforms? Depending on the policy review and evaluation reports, the national systems might be enhanced through an interactive development process as several countries launched a program of thorough assessment over performance indicators. Out of such countries as Uruguay, Sri Lanka, Kyrgyz Republic and the U.S., the greater ones concentrate on monitoring the reading and math skills nationally, and many nations adopt the student assessments of academic achievement regionally and/or internationally (inc. LLECE, SACMEQ, TIMSS, PISA, and PIRLS testing) through an analytical technique of benchmarking to reach a meaningful conclusion. For instance, PISA members, 43 countries, became 65 during the first decade of 21th century while the number of TIMSS nations increased from 45 to 65 throughout the period between 1995 and 2011. According to World Bank (2011), most of the developing countries have very limited evidence in size and scope regarding educational performances. The present methodology used should be reviewed to include more specific criteria to measure the skills required in professional life and develop the curricula and techniques in education as well as to increase the number of the adopting nations of the supranational tests to make comparison of their own evaluation applications with others. Unfortunately, the international tests are not specifically designed to measure a few of key competencies and so we cannot exactly identify whether the students have problem solving techniques, team work capacities or communicative skills.

In its Strategy Paper, World Bank aims to promote a regular collection of current and new types of data in edu-

cation till 2020 and the national initiatives to practice the systematic and periodic evaluation of performances of individual students along with the education system and to upgrade the field policies and infrastructure using the analysis results. Bank's money is on the way to the establishment of performance standards to assess the educational functions as well as its efforts to obtain the conducive data set to any adjustments to these criteria and communicate an analytical report so that a high-quality and effective system can be designed and initiated by national and global authorities (World Bank, 2011).

The curriculum in Turkey is followed by the same subjects at all levels of the classroom, regardless of whether it is private or public school. Although the K8 training program in Turkey has been reorganized within the framework of the Constructivism with the comprehensive changes made in 2007 and 2016, we can say that the program is prepared by a more subject-oriented approach rather than a concept. An example of this is ". For example, in history lesson, I think it is more meaningful to study leadership rather than to teach the sultans from first Osman to Abdülhamit "(Sce, Female). Again for the same participant,the fact that a subject-centered training program instead of a concept can not integrate subject frameworks into the conceptual structure of international exams has made it one of the reasons for the low success of Turkey's education system in international exams.

In addition to these results; all participants indicated that the quality of the question of international exams was quite high and that focusing on them alone would increase the quality of education. One participant mentioned the following reasons for this. *"If we continue to measure the quality of our education through exams, then it is important to participate in exams with high quality questions. The quality of the question in our national examinations*

*is low because of the fact that, unlike developing schools, they only provide training for testing "(*Sce6, Male). In this case, the presence of international examinations with a high level of quality will lead to an increase in the quality of schools; only focus on the test can initiate a "teach to test" stream for a new exam. In order for the system to be integrated, it must include the basic principles of global education. On the basis of global education, there are many elements such as recognizing other societies as the society we live in, being aware of the systems in the world, analyzing the problems and problems, sustainability, multiculturalism, human rights and fighting against discrimination..

As a result, we can conclude accountability of education is crucial. The important thing should not just to grow up students by focusing on the summative evaluation. The aim of a school is not to prepare students for the exams; it is to prepare students for the life but formative evaluation is always necessary to hold system accountable. Aim of the FATIH Project is develop Learning management systems (LMS) and school management systems (e-school), such as the management of schools in the management of the educational process is becoming more measurable with the technological infrastructure. Schools, counties, provinces and country-wide data can be easily accessed and numerical assessments can be done quickly. Finally, we must keep in mind that the determinants of international standards are also determinants of the "new capitalist economy" of the new economic regime. The new capitalism is flexible, entrepreneurial, leader and so on: Features that combine under the main concept of the 21st century skills and the development of their skills in schools will be another important objective of this scenario.

Organizations and Structures

International Baccalaureate is an internationally recognized educational organization. Its goal is youth development to gain people who like to explore, learn and care for others and hence to bring along world peace through global interaction and mutual respect among different cultures. For the sake of such idealism, it collaborates with educational institutions, national or international, in order to elaborate an assessment program that will be motivation source for students to neutralize or eliminate their prejudices and stereotypes about others through active, lifelong learning. In this modern age, people are to approach to this sinister issue of discrimination very politely and sensitively by embedding the peaceful behaviors into the center of life without remaining remote. In the future, there can number of this kind of learning organizations increase or another internationally focused school model come out.

The Geo-political Dimension

A number of fashions in quality assurance and performance assessment develop under the impact of global mobilization. The concept of education present in the General Agreement on Trade and Services begins to diffuse into the mezzo-level agreements, and the common descriptions of curriculum extension and academic achievement are necessary for global exchange of students. It has appeared in various ways such as the Bologna Declaration of 1999, the Lisbon Recognition Convention, the Organization for Economic Cooperation and Development (OECD). The 'Bologna' aims at the European Higher Education Area in which the educational standards of assessment are valid. The 'Lisbon' emphasizes upon the role of college choice in social mobility and the ability to make assessment by benchmarking academic expectations and standard qualifications. The 'OECD', as a representative for greatest developed countries, has seen education policy as a catalyzer

to achieve the organizational goals because of its economic outcomes, and at last in 2002 a specific unit was established, the Directorate for Education. All that trends show us there is a tendency to create a global human model and facilitate the mobility of educated labor. These trends can support Scenario 1 to come up in the future.

Results forScenario 2

The scenario of Scenario 2, which is a scenario where "everywhere, every time" technology use and "standardization" trends will increase in importance, is as follows. In Scenario 2, personalized learning environments are the most important issue in education. Personalized learning involves access to 7/24/365 learning environments through technology support and support for personal interests and skills to achieve the knowledge and skills set by standards. In order for learning environments to be accessible 24/7/365, learning platforms to be reached by mobile vehicles as well as the technological infrastructure of schools have been supported. Identification of the interests and abilities of the students is not used for diagnostic purposes but is used for the personalized arrangement of the content, process and product stages of the training.

Attitudes, expectations, political support

Among the educational institutions, the major one has already been "school" or even more specifically primary and secondary education schools. Having access to teaching service is very dependent on chance for some at least in terms of money, time, place, or any other resources. The 20th century and so on has became the period when a great majority of child students find an equal opportunity to be educated at the baseline that is drawn by professional educators as a standard. One factor in this success story focuses on financial concerns and thus efficiency matters,

shortly meaning processing minimum inputs for maximum outputs (cost-efficiency) or producing maximums with minimums (productivity). Here, the maximum point is ironically the basic level for students and so national education systems are considered efficient and successful. What about effectiveness regarding outcome and impact? Whether enlightened, exploratory and lifelong learners are grown up in the education system could have been our basic desire and drive, but however trained, tamed and specialized students are success in the industrial communities "for now" though that level is satisfactory or less in the knowledge based societies in these days when the social transformation from manufacturing to design or digital age is continuing.

The rapid development of technology is not only related to the dissemination of cheaper, smaller and easier-to-use instruments in our lives. The development in technology is profoundly affecting people's business lives, their daily lives, and therefore their education. A teacher who enters today's class can not see himself as an investor who transfers money to empty accounts as in Freire's "banking model." Especially from the moment they were born, no share of education can ever see their role in a structure that can reach millions of pages of information with an internet connection and a telephone. The arrangements to ensure that Scenario 2 can be reached 7/24/365 for educational resources will ensure that each student reaches open sources. In this case, the difference in reaching the educational opportunities among the students can be expected to decrease. In addition to accessibility, the arrangement of contents according to the characteristics of the students will support the learning of the students.

The fact that the technology and student features are on the upscale will naturally change teacher roles as well. The teacher needs to follow the technology and use his tools

with the skill of using a pencil. In this scenario, schools are focused on technology and teaching, not technology. If the infrastructure provided by the FATIH Project, which was mentioned in Scenario 1, is used actively in all schools, it may also allow for the development of Scenario 2.

Many technological devices are designed to neutralize the physical disabilities that may obstruct for children to access to learning. In the cases that computers can be non-usable to login in the software programs, some special hardware rescues the disabled children from this desperation so that they can keep up with their classmates. Likewise, visual or auditory problems can be easily dealt with using a variety of software. As understood, computer-, internet-, and digital-based technologies mean socialization and human development not only for the able but also for the disable children.

Goals, functions, equity

The results showed that as the information technology evolves, productivity in the education sector will be further enhanced with the participation of interactive systems until 2025 and this will create more space for personalized education. It is known that detailed information of education conditions is required to develop technological solutions but the education sector has no tradition of producing the technological solutions. The use of information technology can help to develop individualized teaching methods. Thanks to the programs designed to take into account the differences between users, we can bring out the products that are more focused on individual needs than any book can do and reduce the routine works of teachers, so that we can increase the possibility of taking care of each student individually. In the name of a more individualized education, the education in the classrooms would

have been much more personalized than today, if we had removed only the age factor criterion (Paludan, 2006).

Personalization is not just about choosing one from alternative channels, it shapes and unifies many different learning resources and the resources supporting personal development. This will lead to important consequences for our current system in many respects. However, these results can not be clearly listed because they depend on the interaction of many factors (Bentley& Miller, 2006).

The technologies needed for individualized learning are already available. For example, the smartphones or tablets we have and the applications we can download directly reflect the interests of the people. There are hundred of thousands of applications available and we see that the applications on the phone of anyone are not the same as in someone else's phone. Everyone has different preferences and different learning and exploring styles. This is the basis of personal learning environments. Today many educators argue that learning styles should inform about the experiences we created in the school. Effective learning environments are based on students rather than on technology, but the individualized learning environment is concerned with the activation of technologies and tools. Cloud computing, for example, allows individuals to store the content they want, and cloud-based production tools such as Google-app and WikiSpace allow them to share their own contents with others, access new and relevant products, write personal comments, do homework and much more. YouTube, iTunes U, Facebook and other social media and open content platforms allow users to discover new contents and share their own contents with others. Using a mobile tool or tablet for the PLE (Personal Learning Environment) makes the process both easy and portable. The basic idea behind personal learning environments is that the students are responsible for their own

learning process in the direction of their own needs and preferences. The aim is to make the learning process of the student as effective and efficient as possible.

Finally, if we want to survive this scenario, education should not be accepted as the consumption market of technological tools. Educators should be able to demand their own products themselves. Because,today education sector is only a market for software engineers and technology companies. For the future, teacher and learners must shape the technology in terms of their demand. rather than extinguishing technological devices like a consumable material, educationanl technology should be shaped by demand.

Organizations and Structures

Despite regular timing of the education is subject to change, nearly all schools over the world uses the same schedule. Summer holidays are the custom of agriculturalsociety and allocation of time will be the first thing to change in this scenario. As aforementioned access to educational resources will be 7/24/365. The results showed that one of the characteristics of information societies is organizational structures liberated from centralization, unlike ever. The strict hierarchical structure of the industrial society has left its place to more flexible, interconnected organizational structures. Knowledge-intensive tasks require independence, commitment and individual responsibility. The business community wants the education system to raise individuals in this way, with a more personalized system and without coercion.

Geopolitical Dimension

Computers and information technologies have become a part of daily life, from work to entertainment and social interaction. While it was only anglophone in the past, internet is now a global phenomenon that is evident in al-

most every phase of our lives. The language we use also reflects this change: the words such as Google, tweet, Skype has settled into our dialogue in a spectacular way. Many complex pedagogical and technical question in terms of education are the best way to be followed to encourage teachers to use technology properly in the learning process. For example, a student who found an information that is sometimes thought to be written as a result of a very detailed investigation, but it is actually doubtful or has a single point of view on the internet learns to assess the quality and objectivity of this information through these tips (OECD, 2013).

The increase in the amount of global internet activity (traffic flow, not just the number of websites) has been so fast total IP traffic by the end of the 1980s and the in the 1990s doubled compared to the previous year in the US every year until 1995. In 1995, this rate was ten times higher. Since 1995, global IP has also increased and it was so rapid that the increase in the rest of the world has just passed the increase in the United States in 2000. These enormous increases can be associated to many cases such as the increase in mobile devices (especially devices suitable for internet use, such as smartphones and tablets), the increase of internet users, the emergence of faster broadband, more affordable accessibility, more video use and voice via internet (VOIP, for example Skype) (OECD, 2013). While all these developments are happening in the world, the FATIH project in Turkey has been one of the biggest breakthroughs in the education sector. As we have already mentioned, this project aims to equip classes with IT equipments in order to realize IT-supported teaching.

Results of Scenario 3

Question (3) Scenario 3 Framework is designed to elaborate on the third scenario of the study. This hypothet-

ic case indicates: Today, if we accept the schools function of socialization is in the foreground, there are criticisms about 'monotype human education' for this situation. How is a school that is differentiated based on the talents and interests of the student? Let us assume that, a school structure that will be shaped based on the needs, interests, and approaches of the students, and flexible structure will be constructed. The purpose is not to reach the standardized goals but to create an environment that each student can move in his/her own abilities and own pace.

Attitudes, expectations, political support

Despite the fact that progressivism was popular recently, schools can not provide the requested data on accountability; has progressed to learning the previously accepted knowledge that it is useful. This scenario is providing individual education in schools which seen as an agent for a society. (Melting pot/ endocrine agent/ indoctrination). Setting individual goals for students means at the end of the day every single learner will be in different level and depth in their learning. The second challenge is how to combine individualization in delivery with accountability for results. No one believes every learner has the same needs; but individuality on its own can lead to paucity of quality.

This scenario is demanding not only in terms of education, but also for the wider social and economic environment that will support it. This scenario which envisages a great support and trust in institutions also assumes a large amount of funding from various public and private sources. Because one of the most important causes of mass education in the classroom is the low cost. The scenario also envisages a wealthy, highly skilled society with a strong sense of equality, with the schools that are expected to be representative of new developments and knowledge both nationally and internationally.

Goals, functions, equity

The results of the interviews showed that there was a great need to keep in mind the various needs of the learner. Additionally, the participants also discussed whether personalization reflects social and learning diversity, and if so, which forms of diversity the personalized system should contain. At the moment, diversity is introduced into the school system in a variety of ways, but the most effective way focuses on the diversity of subjects by excluding each point of education and teaching and its standard organization (Bentley & Miller, 2006).

Diversity can be explained in many other ways: (1) the diversity of organizations involved in providing learning, (2) the diversity of opportunities, locations and forms, (3) the diversity of learner and intelligence profiles, (4) the diversity of choices offered to each student and his/her family at a given time, (5) the diversity of implementation and possible responses of each provider that reaches the diversity of learning possibilities within a given organization.

But the extent to which diversity reflects the actual differences in learning and progression is still a matter of debate. So, for example, what kind of changes are needed in our qualification and rewarding systems in order to reflect the types of skills that we are still learning about and the diversity of human intelligence that attracts attention of 21st century society? What kind of assessment methods and infrastructure are needed to recognize more diverse learning activities? What role can the digitization of assessment records and methods play in this field?

One participant elaborate on this issue:

> "I think it may seem like a dream that there are one million curriculums for one million students but at least the numbers of the curriculums can be increased. I think that there is one curriculum for millions of people is more and more

> nonsense behavior than this. Students sometimes can really be aware of their needs. For example, a student saying that I will be an engineer so I need to learn maths should find a class at school that s/he can take the adcanced math classes. Or else a student who wants to study internation relations should find a school that s/he can learn a second or third language"(Sce8, Female).

This explanation led us to think in detail about differentiated teaching because differentiated teaching is an educational method that offers various learning options designed for different levels of readiness, interest and learning profiles. In a differentiated class, the teacher uses (1) different ways for students to discover the curriculum content (2) various meaningful activities and processes that students can understand and build their own knowledge and ideas, and (3) various options that students can reveal what they learned.

As a result, differentiation is a philosophy that enables educators to make a plan strategically in order to reach targeted standards and meet the needs of various learners in today's classrooms. Differentiation is not a toolkit, but a system of beliefs that educators acquire in order to meet each student's unique needs. Participants mentioned that children's out of school learning, because it is characterized by passions and interests, also needs support at critical junctures. Most children are able to develop a new interest in an area, the challenge is then to support them when they 'get stuck'. There are children developing skills in a range of different domains who, when they wish to move to the next level of difficulty in that area, are unable to do so because they do not have access within their families or communities to the sorts of just-in-time support and scaffolding that would be needed to help them make that leap.

Results showed that a key role for formal educational settings is to understand these needs and find ways to

enable children to be put in touch with others (within or out with their communities) who are able to provide a supportive community context within which children can make these leaps to the next stage. Without this support, many of these interests and passions can fade away and become unfulfilled. This sort of just in time, networked support is a key component in achieving the goal of 'fulfilling children's potential'. Results also showed us the ongoing debate on 21st century skills. One participant stated the importance of not to limit our focus by looking what is hot today. This can be said that decisions cannot be based on what is exists; rather, what exist today can only be fully understood when seen as part of a continuum of past- present and also future.

Organizations and Structures

Today's worries about education can be summarized as the keywords standards, curriculum reform, traceability and exam. The logic is that if the line goes up, then the students will be more successful. Standardized textbooks, curriculum and learning frameworks and better teaching and learning will emerge. If schools are held responsible, educators will produce results. If students are tested to see what they know and what they can do, both students and teachers will be motivated to prevent outcomes with low scores. Although this approach, which aims to increase the success of the students, has good sides and supporters, it is possible that the educators who focus only on the factors outside of the students have a limited success. Children and youth can not be standardized. The representation and self-esteem of young people also highly affects the values they give themselves and the educational performances that are dependent on social conditions. If young people are expected to become thinkers, learners and individuals who provide valuable contributions to the society, it is

necessary to know more than the scores on the standardized success measures.

In addition to these results also Scenario interviewees 1 and 4 mentioned that the most neglected group of students in K-8 is gifted learners. The school bureaucracy claiming that it is a social disadvantage to the students to skip grades for the sake of learner diversity. On the contrary, research shows that there is no significant effect on the social adjustment on students' moving ahead as many as two grades. With this information there can be some arrangements can consider for this scenario for advance learners like: acceleration, skipping grades and starting high school or university earlier.

The Geo-political Dimension

Standards and benchmarking movements in the 1990s revealed a stability in resolving past low-level expectations and class-based inequalities in education. To do this, it gave great importance to reaching the basic objectives in order to equip students with the competence and knowledge required for them to reach full capacity in the school curriculum. Despite consistency and informed instruction, these policies have always been together in a movement towards a more diverse learning system. Emphasis on a more diverse society reality with growing learner abilities and expectation of sensitivities from individual students and their families will continue to grow. The effort to combine this sensitivity with common public environments that promote norms of justice, contribution and reciprocity is important for the future of all public services (Bentley and Miller, 2006).

Results for Scenario 4

Question (4) Scenario 4 Framework states: When we look at today's schools, the school provides a service (ed-

ucation and training), and the students receive this service under compulsory education. What kind of school model would you suggest considering a system in which students make their own decision on learning and schools can respond to these decisions in the construction of a system in which students and schools have no obligations? An organization where the difference between the learners is centralized and the standards that everyone needs to be reached for are not defined, and that the learners can take their own responsibilities (autonomous learners). An organization at this level will be created in an environment with with high parental involvement, social support and trust. An information center structure where the research skills come to the forefront, rather than a typical school. The learners will attend the learning environment with programs that they will prepare according to their own interests and needs by consulting with the advisors, without being separated into age and class levels. This participation will be performed by groups or individual studies organized according to the level of interest and preliminary knowledge rather than the age level. Since there are no class levels, there will be a totally open system that does not involve the transition between the education levels and the class repetition. The necessary information system will be set up so that the students can access the 7/24/ 365 educational resources from outside the institution.

Attitudes, expectations, political support

On the basis of this scenario, there are different criticisms such as the fact that the schools exactly reflect the unequal social and economic structure, not adequately represent different cultures or not progress parallel to economic life. The dissatisfaction with the current conditions leads to be replaced schools with different alternatives in the political environment that supports change. This brings us even further thanks to the possibilities offered by the

internet, effective and cheap IT facilities. Another important poin is the pressure of high stakes exams caused great distress among both students and families and their controversial position can create a new mainstream for this scenario.

Parents and learners must feel great deal of unsatisfaction from current education system to demand Scenario 4. Turkey has the highest income gap among the OECD countries. Parents might reject to attain their children to schools that are producind and supporting inequality in society. In other words, as Bourdeue and Passeron (1990) state schools are the agents of reproduce inequality by perpetuation of class privilege. He also mentioned that change is always possiple if people resisitsts. On the other hand students can resist by make dissatisfaction public, absentaism and high drop out rates will be evidence. Total rejection of standarts and McDonaltization of society phemomenon (Ritzer, 2012) can be another important stream for this scenario.

Alternative schools have been established since the 1970s to meet the needs of children and adolescents who can not effectively learn because of learning disabilities, some medical conditions, psychological and behavioral issues, or advanced skills in the traditional school environment. When we look at generally, alternative schools have broader educational and developmental goals than traditional schools. The curriculum in these schools contains the elements developing self-respect, individuality and social skills of students. Alternative schools are more flexible in terms of organization and management, which makes more diversity possible in educational programs. Alternative school structure and curriculum varies depending on the educational goals and desired student population.

Goals, functions, equity

Open education is an idea that values the student's natural development and experience in terms of content and method. In the 1960s, there have been significant changes in society in the United States, and new philosophies have emerged in different areas of society. Groups seeking innovation have had to deal with many institutional applications. The criticism of these groups shows their insecurities to decision-making bodies. The educators were inclined to examine events with a traditional philosophical point of view and with the influence of teaching and learning procedures. Later on, this understanding turned into a search for a student-centered institutional model.

In this scenario we find out a hypothetic learning organization and we called it learning centers. These are institutions that provide both informal and formal learning experiences to learners. Participants stated that learning experiences cannot be limited with lectures, workshops or online courses. There must be a combination among all learning facilities. It sounds confusing in first look but there are some implementations around the world like that. First of all we can mention about children's museums and/or science museums. These entities gain children informal experiences through innovative teaching sessions including workshops. Unlike conventional museums, these ones include adaptive displays to children's touches rather than the 'hands-off' limitation. In other words, the underlying assumption of this application is that a social event can become an educational activity.

In the light of above mentioned this is not new thing but participants mentioned that this kind of learning environments in this context can better meet the demand. Furthermore, the educational futurists in institutional design reach a conclusion that the conventional schools that alumni eulogise are already so outdated that they have no

chance to respond to the future necessities and students of today or the potential graduates will be caught unprepared for dynamic professional life in digital world.

Results indicated that learning model should be differentiated to let different disciplines study together. For example, it should have such a special design which has a place for students to study social sciences, human sciences, and maths differently and comfortably that students should go those areas to do the things they would like and there the experts of these topics should support them. In such an institution, there shouldn't be any principle room because it should be bare and clear. It is important to have trust relations and responsibilities.

In this scenario we are did not call this organization school we just called it institution to participants leave behind all their prepositions towards school concept. In this kind of institution children can hang around freely and participate any activity. But the crucial point here is educators know that understanding and learning are different things. So there must be a kind of discussion groups, mentorship implications and feedback system is needed. These kind of institutions can replace with schools or can use as supportive organizations. One participant mentioned that,

> Such as Childrens' Museums, students will go there, talk to their consultants, plan their day and topics. There should be places like outdoor study areas, labs. There shouldn't be any bells but there should be places that they can study individually like study rooms or saloons for group works. Also, these can support school in terms of physical environment. It should be a place that the seriousness of the issues can be understood, not just to look at, such as implementations like child universities. It is not just to wander museums, it is to try the materials, talk to them and to make it in a systematic way. I can be used for people do home schooling or the ones who don't have a chance to study on the desired topics in their schools (Sce11, Female)

In addition to that the role of a school guidance counselor will change totally, who has supportive, guiding role in academic achievement as well as psychological and sociological development in collaboration with the learning sides. Students have various necessities, duties and concerns in parallel with their stages in development, such as childhood, adolescence, and youth, and the counselors' terms of reference are specified in consideration of this variety. Here in this scenario results indicated that role is highly important. Participants mentioned about the establishing a new organization to school counselors in this kind of education structure.

Organizations and Structures

Under the public administration in education, more powers are delegated to local authorities that are financially more independent on decentralized basis, and accordingly good governance and civil participation in policy making can be promoted through the efforts and expectations of stakeholders including teachers, principals, school management, local administration to enhance the more client-oriented education system in quality and reasonability. A participant stated that "establishing local learning centers also related with the role of authority. We need to to strengthen local administration to response local needs of learners." This kind of flexibility let learners be mobile among educational institutions. This is a different type of the participants mentioned in Scenario2. In Scenario 2 participants mentioned about hybrid learning designs for personalization but in this scenario personalization of learning is going on among institutions.

The Geo-political Dimension

It is necessary to acknowledge the weaknesses of schools for the implementation of the scenario 4 model that supports the schools, and that these weaknesses can not be solved within the school itself. This scenario is not an attempt to weaken the school, but rather an attempt to make it stronger. In order for scenario 4 not to come into de-schooling, the post-modernization must be at the highest point and the school system must be completely rejected. It is also possible to create new types of institutions where schools can be relieved of the effects of meta-narrative and individuals can demand that they learn what they need according to their own interests and needs. The World Bank's "education for all" strategy changes over time as "Learning for all", and education is not just under responsibility for schools, and that all the educational expectancies cannot be achieved if they are expected from only the state.

New strategies explicitly acknowledge that learning opportunities go far beyond the educational opportunities offered by the public sector. Critical learning activities are also available outside formal schools. For example, a child will continue his / her learning activities before starting to school or after graduating from school (Dang and Rogers 2008; Bray, 2009 according to the data from the World Bank 2011).

CONCLUSION

This study was conducted to seek answer for the possible scenarios for the future K-8 schools in Turkey. Results of this question have significance to provide alternative pathways for schools and evidence for long-term policy making for the future in the field of education. Scenario development illuminates the ways that policy, strategies and actions can promote desirable futures and help pre-

vent those considered undesirable. In the light of aforementioned points, this study has speculative aims rather than using this in problem-solving activity. For the scenario creation of the study there are four scenarios developed. Researcher like to remind that these four scenarios can come out one by one or altogether. This means one scenario can be present itself but there is another scenario can find a place in system.

In addition to that there is a very controversial issue is present. The 'self-fulfilling prophecy' defined by Robert Merton (1968) in effect launches a mechanism which ultimately proves it true despite its implicit falseness available inside the theoretical assumption as embedded from the very beginning. Thus, it creates a fallacious validity to sustain the error in some respect. If you assess the success in accordance with prespecified or presupposed course of actions or chain of events subject to the inaccurate prediction, the mistake in the projection will be naturally non-recognizable and remain insoluble without an antithetical proposition against the original prophecy. Let us assume. If the identifying authority make an assumption that Afro-American children showing less scholastic success, then in planning phase it allocates less resources, less experienced teachers and poor school conditions based on this false assumption, those students can supposedly or at least unsurprisingly have poor grades. As a result, the mechanism set to get the prophetic result will eventually affirm the initial prophecy. In the present study, those scenarios might be diseased by such a self-fulfilled prophecy or vice versa. This means maybe policy implementers can feel uncomfortable with one or more scenarios and can create support policies to opposite ideas.

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FACTORS AFFECTING ACADEMIC PERFORMANCE OF UNDERGRADUATE STUDENT AT FACULTY OF AGRICULTURE: THE CASE OF CUKUROVA UNIVERSITY

CHAPTER 8

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1. INTRODUCTION

Education has a long term effect on one's life. A Person's knowledge and skills acquisition are valuables, which are acquired through regular and irregular education, determine his/her potential in the future. Students' academic performance is affected by many factors including socio-demographic, education, spend spare time activities. The researcher conducted many studies about the factors affecting student academic performance at different levels (Abdieva, 2015; Alon & Galbgiser, 2011; Ayyıldız et al., 2014; Sarath & Hudson, 2006; Vural, 2013). The main purpose of this study is determined factors affecting the academic performance of undergraduate students at the Faculty of Agriculture, Cukurova University. These factors can be collected as socio-demographic and economic status, residential area, spare time activities on studying, working, sleeping, watching TV, and former school background. So, this study aimed to analyze the effects of these factors on student performance and to looking for a solution to increase students' performance.

2. METHOD

The provenance of data for this study was the primary data collected by the use of questionnaires from 200 undergraduate students in the Faculty of Agriculture, Cukurova University. Background information consists of 32 variables based on demographic information, education, and the spent spare time. The data was gathered in May 2015. The distribution of students who joined the survey among departments is shown in table 1.

Table 1. *Distribution of students who joined the survey among departments*

Department	Frequency	Percent
Agricultural Economics	21	5.25
Agricultural Machinery and Technology Engineering	20	5.00
Agricultural Structures and Irrigation	21	5.25
Animal Science	19	4.75
Field Crops	20	5.00
Food Engineering	20	5.00
Horticulture	20	5.00
Landscape Architecture	20	5.00
Plant Protection	20	5.00
Soil Science and Plant Nutrition	19	4.75
Total	200	100

In order to determine the significant difference of academic performance between male and female and the other factors two groups, t-test was employed and ANOVA was carried out to compute the variance within each group for the factors more than two groups (Alpar, 2011; Kalaycı, 2008; Miran, 2002). In this study, multiple linear regression analysis was used to examine the relationship between a dependent variable (in this case student's academic performance) and two or more independent variables (the predictors) (Greene, 1997; Hair, Anderson, Tatham, & Black, 1994; Kalaycı, 2008). The regression model used to analyze to relationship academic performance of students and the predictors can be established as;

$$GPA_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_n + \varepsilon_i$$ (equation 1)

The variables used in the multible linear regression analysis and their definitions are shown table 2.

Table 2. *Variables and definitions in regression model*

Variables	Definition
GPA	Students' grade point average
SCOREH	Score of high school
GENDER	Gender (1: male; 0: female)
CLASS2	Class of respondents (1: second; 0: other)
CLASS3	Class of respondents (1: third; 0: other)
CLASS4	Class of respondents (1:fourth; 0: other)
TVHOURS	Watching TV (1: equal and less than 2 hours; 0: other)
INTHOURS	Using Internet (1:equal and less than 2 hours; 0: other)
INCOME	Income (1: Less than 700 TL; 0: Other)
REFERENCE	Use teachers' suggested (1: No; 0: Yes)
ROOM	Having a Study Room (1: No; 0: Yes)
AGEGROUP	Age of students (1: Less than 23; 0: More than 23)
MASTER	(0: Student wish to do a MSc degree after gratuation; 1: Not wish)
STUHOURS	Study hours (1: More than 3 hours; 0: Other)

The independent variables should have little or no correlation with each other to avoid problems caused by multicollinearity, Kolmogorov-Smirnov test used in order to check this. (Kalaycı, 2008).

3. Findings

3.1. Variation of Academic Performance with Socio Demographic Factors

In this section, it was tested whether the academic performance of students is changed according to sociodemographic factors. The conclusions of the t-test applicable for all variables in table 3 but only three variables are significant. The conclusion indicated that there are no statisti-

cally significant differences in academic performance between single and married, have a college student sibling, smoking and no smoking, have a study room and not have a study room, living at home and at the accommodation. According to the result, there are statistical differences in academic performance between males and females, have a chronic illness and not have a chronic illness, family members have a chronic disease and family members have not chronic diseases. The result shows that male is more successful than female in academic performance. And students have a chronic illness and family members have chronic disease are achieved higher scores.

Table 3. *T-test results summary for the relationship between sociodemographic factors and academic performance*

FACTORS		Frequency	Percent	GPA	t-value	p-value
Gender	Male	141	70.50	2.45	3.470	0.10
	Female	59	29.50	2.17		
Marital Status	**Single**	197	98.50	2.25	0.480	0.634
	Married	3	1.50	2.40		
Smoker	**Yes**	76	38.00	2.19	-1.410	0.161
	No	124	62.00	2.29		
Have a Study Room	**Yes**	118	59.00	2.21	-1.480	0.140
	No	82	41.00	2.32		
Living Place	**Home**	71	35.50	2.26	0.168	0.866
	Accomodation	129	64.50	2.25		
Have Chronic Illness	**Yes**	27	13.50	2.47	2.246	0.026
	No	173	86.50	2.22		
Family Members Have Chronic Disease	**Yes**	44	22.00	2.38	1.736	0.084
	No	156	78.00	2.22		

*** indicate significance levels at 10%**

The relationship between academic performance and socio-demographic factors more than two groups were examined using ANOVA. The result showed in table 4, students' academic performance is different in the age group. Confirming the differences are significant, the F value of 2.283, whose significance value of 0.086 is less than 0.10. Students' who their age ranging 21 and 23 are more successful than older students, but there is no statistically different than young ones. Furthermore, remainder factors (father's work, mother's work, income group, father's education level, size of household group and mother's education level) are not significant and there is no relationship between them and academic performance.

Table 4. *Results of the descriptive statistics and ANOVA for the relationship between academic performance and sociodemographic factors*

Factors		Frequency	Percent	GPA	F-test	P-value
Father's work	Unemployed	14	7.00	2.13	0.404	0.75
	Public sector	53	26.50	2.29		
	Private sector	66	33.00	2.23		
	Own business	67	33.50	2.27		
Mother's Work	Unemployed	77	38.50	2.24	0.215	0.886
	Public sector	41	20.50	2.27		
	Private sector	47	23.50	2.22		
	Own business	35	17.50	2.30		
Mother's Education Level	Unlettered	20	10.00	2.24	0.223	0.88
	Primary Scholl	79	39.50	2.27		
	High Scholl	47	23.50	2.29		
	University	54	27.00	2.21		
Father's Education Level	Unlettered	13	6.50	2.18	0.411	0.745
	Primary Scholl	76	38.00	2.30		
	High Scholl	45	22.50	2.26		
	University	66	33.00	2.22		

Age Group	**18 - 21**	128	64.00	2.23	2.283*	0.086
	21 - 23	56	28.00	2.36a		
	23 - +	16	8.00	2.05b		
Size of House Hold Group	**2 - 4**	99	49.50	2.25	0.022	0.978
	5 - 7	91	45.50	2.26		
	7 - +	10	5.00	2.25		
Income Group	**Less than 400 TL**	18	9.00	2.24	1.773	0.154
	400 - 700 TL	65	32.50	2.33		
	700 - 1000 TL	45	22.50	2.34		
	More than 1000 TL	72	36.00	2.15		

*** indicate significance levels at 10%**
a / b The mean difference is significant at the 0.10 level

3.2. Variation of Academic Performance with Education Factors

55.5% of students use the references suggested by teachers. The result of the t-test is shown that there are statistically differences usage of references and students' grade point average because of t value 2.309 and p-value 0.022 less than 0.10. ANOVA was carried out to compute the variance within each group for the factors more than two groups and results are shown in Table 5. According to the results, there is a difference between academic performance and useful suggested references (F value 2.513, p-value 0.086 less than 0.05). Remainder factors are not significant and don't have a relationship between them and students' grade point average.

Table 5. *Results of the descriptive statistics and ANOVA for the relationship between academic performance and educational factors*

FACTORS		Frequency	Percent	GPA	F-test	P-value
Like the field you are studying	**Yes**	57	28.50	2.31	1.272	0.283
	Not Least	113	56.50	2.26		
	No	30	15.00	2.12		
Class	**First**	51	25.50	2.14	1.307	0.273
	Second	49	24.50	2.25		
	Thirt	48	24.00	2.34		
	Fourth	52	26.00	2.30		
Useful (suggested references)	**Less**	11	5.50	2.15[a]	2.513	0.086
	Median	65	32.5	2.26[b]		
	More	33	16.50	2.46		
Type of High School	**General High School**	82	41.00	2.09	0.891	0.447
	Anatolian High School	70	35.00	2.10		
	Science High School	5	2.50	2.19		
	Vocational high School	43	21.50	2.15		

*** indicate significance levels at 10%**
a / b The mean difference is significant at the 0.10 level

3.3. Variation of Academic Performance with Spare Time Activities of the Students

The relationship between spare-time activities and academic performance are shown in table 6. According to the results, there is the relationship between watching TV (t value 2.379, p-value 0.071 less than 0.10), spending time

to study (t value 4.729, p-value 0.003 less than 0.10) and academic performance. Therefore, we can say that students who more hours spent studying, generate greater scores.

Table 6. *Results of the descriptive statistics and ANOVA for the relationship between academic performance and spare time activities*

FACTORS		Frequency	Percent	GPA	F-test	P-value
Hours a day spend on internet and social media	**Less Than 1 Hour**	31	15.50	2.23	1.202	0.310
	1 - 2 Hours	96	48.00	2.26		
	2 - 3 Hours	42	21.00	2.36		
	More Than 3 Hours	31	15.50	2.12		
Hours a day spend watching TV	**Less Than 1 Hour**	85	42.50	2.20[a]	2.379	0.071
	1 - 2 Hours	67	33.50	2.21[b]		
	2 - 3 Hours	35	17.50	2.46[a/b]		
	More Than 3 Hours	13	6.50	2.27		
Hours a day spend sleep	**3 - 5 Hours**	23	11.50	2.33	0.258	0.773
	5 - 8 Hours	135	67.50	2.24		
	More Than 8 Hours	42	21.00	2.25		
Hours a day spend study	**Less Than 1 Hour**	54	27.00	2.11[a]	4.729	0.003
	1 - 2 Hours	105	52.50	2.33[a]		
	2 - 3 Hours	37	18.50	2.18[b]		
	More Than 3 Hours	4	2	2.92a/b		

*** indicate significance levels at 10%**
a / b The mean difference is significant at the 0.10 level

3.4. Results of Regression Analysis

Results of the regression analysis for the effect factors on students' academic performance are shown in table 7. It was determined that there is no multicollinearity between independent variables. In order to see whether the model error terms have a normal distribution or not, the Kolmogorov-Smirnov test is used and the null hypothesis (H0: Error terms are normally distributed) could not be rejected at the significance level of 0.05. According to these results, this regression model suitable for the linear regression model assumptions. The value of R2 shows that 19.1% of the variation in the dependent variable was explained by independent variables. The F value of the regression model is 3.386 and the level of significance of the data is p-value 0.000, which is smaller than 0.05, meaning that regression models can be used.

Table 7. *Results of the descriptive statistics and regression analysis for the effective factors on the academic performance*

Variables	Mean	SD	Coefficients	Std. Error	t-values	P-values
CONSTANT	-	-	2.013	0.304	6.611	0.000
SCOREH	67.74	10.6100	0.008	0.003	2.304	0.022
GENDER	0.705	0.4572	-0.202	0.084	-2.412	0.017
CLASS2	0.245	0.4312	-0.169	0.102	-1.661	0.098
CLASS3	0.240	0.4282	-0.098	0.101	-0.965	0.336
CLASS4	0.260	0.4397	-0.001	0.103	-0.011	0.991
TVHOURS	0.760	0.4282	-0.202	0.09	-2.246	0.026
INTHOURS	0.635	0.4826	0.080	0.079	1.017	0.311
INCOME	0.415	0.4940	-0.034	0.077	-0.437	0.663
REFERENCE	0.445	0.4982	-0.124	0.073	-1.685	0.094
ROOM	0.410	0.4931	0.092	0.076	1.213	0.227
AGEGROUP	0.385	0.4878	0.106	0.144	0.738	0.461
MASTER	0.920	0.2720	-0.138	0.075	-1.825	0.070
STUHOURS	0.020	0.1403	0.571	0.254	2.252	0.025

*** indicate significance levels at 10%**

According to the results of regression analysis, 8 factors are statistically significant at 10% significance level or less. The first variable is the constant term. This is the predicted value of degree when all other variables are 0. The results of the estimated parameters of SCOREH (p values 0.022), increasing high school score affects students academic performance positively. And we can say that students having a good score in high school get a good score in the Faculty of Agriculture. The results of multiple linear regression show that gender is an important factor affecting students' academic performance in our study. The coefficient for GENDER is significantly different from 0 because its p-value (0.017) is smaller than 0.10 levels. According to these results, females are more successful than males. Estimated coefficients for CLASS2 (-0.169) is statistically significant because its p-value (0.098) is smaller than 0.10 levels, and indicated that second-grade students get lower score other grade students. Internet and watching TV have been an important part of people's lives in today's generation. Watching TV is negatively related to the academic performance of students. Then, these results show that students spending more time on TV get lower scores. However, the coefficient for INTHOURS is not significantly different from 0 because its p-value is 0.311, which is more than 0.10. Estimated coefficients for REFERENCE and MASTER are statistically significant because their p-values (0.094 and 0.070 respectively) are smaller than 0.10 levels. These results indicated that students who wish to do master and who use references suggested by teachers are more successful. And moreover, there is a positively and statistically significant relationship between the time of study of students and their academic performance. Remainder factors are not significant and there is no relationship between them and students' grade point average.

4. DISCUSSION AND RECOMMENDATION

According to the results of the study, females are more successful than males. And students who have a good score in high school get a good score in university too. Former school background is the mission in the set academic performance; therefore the educational system should be considered as a whole from first-class to Ph.D. degree. Students spending more time to study and students wish to do master generated the good score. Students should be canalized to graduate education from the first year of college. On the other hand, students spent much time watching TV do not get a good score. In addition, students that have a job do not get a good score. Moreover, students who use references suggested by teachers are more successful. We recommended that this study should be conducted at wide level of university and Turkey so that its results became valid for the whole country.

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CARTOON PREFERENCES OF PRESCHOOL CHILDREN

CHAPTER 9

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The idea of the loss of childhood in the twentieth century has become a highly popular topic, attracting the interest of social media, families and schools. There has been an increasing change in general ideas about the meaning of childhood. Childhood can be viewed as a social structure, while the meaning of childhood can be subject to social and cultural changes (Buckingham, 2013). Television in general and the cartoons shown on television are major factors in this change, comprising both visual and auditory mass media from which children have learned by modelling or imitation since the mid-1980s (Bayrakçı, 2007; Yetim & Sarıçam, 2016).

According to RTÜK in Turkey (2009), compared with the first Television Tracking Trends Survey conducted in 2006, television viewing times have decreased, as has confidence in television. According to RTÜK (2006), reading books was ranked as the most popular activity at 64.9% and watching television ranked second at 64.6%. These two activities were followed by playing/spending time with friends at 37.9%. Various international surveys and statistics have also shown that watching television, including by children, manifests as a great investment of time, or in other words, watching television is a time-consuming phenomenon (RTÜK, 2007). According to RTÜK (2012), there has been a decrease in the time spent watching television.

In a rapidly developing world, children who are more affected by changes in social processes than adults can easily adopt different value judgments through television. Children are generally a passive audience in front of the television. As a passive audience, children witness scenes on television that can be either appropriate or (often) inappropriate for them and through this testimony they learn about cultural values, gender roles, the lifestyles of differ-

ent cultures, social roles and create their own consumption culture through advertisements (Güven & Akıncı, 2014).

It is stated that children watch television for one to two hours a day from three-four years to 12-13 years of age. In some studies, it has been found that families are effective in choosing cartoons (Yetim & Sarıçam, 2016), while others have found that parents allow their children to watch cartoons because they think it is an easy way to finish their work, relax or eat (Stamou, Maroniti & Griva, 2015; Ayranci, Kösgeroğlu & Günay, 2004). In research conducted by Kayla Bois and Brad Bushman at the University of Michigan, it was found that children between the ages of two-five years watched cartoons 32 hours per week, children aged between 6-11 years old watched 28 hours of cartoons per week and 71% of the 8-18 age group had a television in their rooms. They stated that there was no parental follow-up of what was being watched on television for 53% of children aged 7-12 years old, while 51% of the houses had the TV turned on continuously.

In recent years, it has emerged that the time spent by children watching cartoons through television or the internet has increased and the number of programmes that are said to be suitable for "children" and the effects of these programmes on children need to be examined.

Positive and Negative Effects of Cartoons on Children

In addition to the negative effects of cartoons, there are also positive effects on children's understanding of the outside world (Büyükbaykal, 2007). Media and television include opportunities and risks for children, and families need to be more conscious in guiding their children's communication processes with television (Gigli, 2004). Positive effects can be listed as follows:

1. With a well-designed cartoon, children can recognize hazards that can physically harm them (fire from the oven, danger of electricity).

2. Cartoons can raise children's awareness of life experiences such as tent-building and building boats, healing wounds through the cartoons shown on television.

3. Children can experience events related to science through cartoons, such as finding the direction of the wind and ant nests and acquiring information about the planets (Jensen, 1998; Bjorkqvist & Lagerspetz, 1985).

The negative effects that may be caused by television and cartoons in the era of digital culture, influenced by the effects of the media, television, the internet and the virtual environment, during a period which has been described as one in which childhood is lost, are stated below:

1. Children who have been exposed to the negative effects of media and television and have entered the adult world (Şirin, 1998).

2. Children who easily adopt different value judgments through television.

3. Children who were exposed to television "electronic caregiver" style, when their mothers entered working life (Akıncı, 2013).

4. Children who cannot fully distinguish between imagination and reality, for whom television is more influential in the formation of their self and personality due to what they see (Oruç, Tecim & Özyürek, 2011).

5. It has been found the Turkish spoken in cartoons in an incorrect, foreign manner causes inadequate communication and language skills in children (Haktanır, 2009).

In addition, several studies have shown that watching aggressive behaviours on television is related to aggressive behaviours in the viewer and this relationship is stronger among children. In addition, it has been shown that television can increase their aggression, cause attention problems and affect children according to their personality traits and sociocultural status (Soydan, Alakoç pirpir, & Azak 2017, Çelebi, 2014; Conners-Burrow, Mckelvey & Fussell, 2011; Martin, Razza & Brooks-Gunn, 2012; Singer & Singer, 1980).

Lastly, it is seen that children's watching TV affects their development not only cognitively but also physically. It has been concluded that this relationship is affected by variables like age, gender, ethnical origin, parents' income, parents' habit of TV watching, physical activities which are included in childrens' diet and personal differences between children (Cox, Skouteris, Rutherford, & Fuller-Tyszkiewicz, 2012).

METHOD

This study used the quantitative research approach of content analysis to determine which cartoons are the most frequently watched by preschool children. Content analysis is defined as a systematic and renewable technique in which certain words of a text are summarized into smaller content categories by coding based on certain rules (Büyüköztürk et al., 2016).

Data Collection and Analysis

A questionnaire was prepared by the researcher and the teachers were directed to ask the children their three most-watched cartoons. The teachers recorded the child's gender, age and favourite cartoons according to their answers. Data from 52 preschool children were used. The weighted averages of the children's most-watched cartoons were taken. Ongoing cartoons are based on November 2018. Finally, an analysis of the cartoons in line with the imprint was conducted.

RESULTS

The findings of the research are given below. Table 1 shows the most frequently watched cartoons by the weighted average of the children and the weighted average of these cartoons.

Table 1: *Children's most-preferred cartoons: percentage and frequency values*

Cartoons	**%**	**f**
Niloya	10.8	17
Harika Kanatlar	9.6	15
Rafadan Tayfa	6.4	10
Keloğlan	4.4	7
Kuzucuk	4.4	7
Uğur böceği ve kara kedi	3.8	6
Pepe	3.8	6
Akıllı tavşan momo	2.5	4
Pija Maskeliler	2.5	4
Hapşuu	2.5	4
İstanbulun muhafızları	2.5	4
Diğer	45.5	71
TOPLAM	100	156

Table 1 shows that 10.8% of the children preferred Niloya, 9.6% preferred the Great Wings and 6.4% preferred Rafadan Tayfa. The Akıllı Tavşan Momo, Pijamaskeliler, Hapşuu and the İstanbul Muhafızları were found to be 2.5%. The percentage and frequency values of the children's preferred cartoons according to gender are given in Table 2.

Table 2: *Percentage and frequency values of children's preferred cartoons by gender*

Cartoons	**%**		**f**	
	Kız	Erkek	Kız	Erkek
Niloya	20.3	4.3	13	4
Harika Kanatlar	1.5	15.2	1	14
Rafadan Tayfa	4.6	7.6	3	7
Keloğlan	4.6	4.3	3	4
Kuzucuk	4.6	4.3	3	4
Uğur Böceği İle Kara Kedi	3.1	4.3	2	4
Pepe	6.2	2.1	4	2
Akıllı Tavşan Momo	1.5	3.2	1	3
Pija Maskeliler	3.1	2.1	2	2
Hapşuu	3.1	2.1	2	2
İstanbulun Muhafızları	4.6	1.0	3	1
Diğer	42.1	48.9	27	45
TOPLAM	41.0	58.9	64	92

When Table 2 is examined, it is seen that 20.3% of girls and 4.3% of boys preferred Niloya. In the Harika Kanatlar cartoon, the results show that 15.2% of boys preferred this cartoon in comparison to 1.5% of girls. The percentage and frequency values of the preferred cartoons according to the age of the children are given in Table 3.

Table 3: *Percentage and frequency values of preferred cartoons by age*

Cartoons	**%**			**f**		
	36-48	48-60	60-72	36-48	48-60	60-72
Niloya	13.7	11.4	5.7	7	8	2
Harika Kanatlar	13.7	8.5	5.7	7	6	2
Rafadan Tayfa	1.9	10.0	5.7	1	7	2
Keloğlan	5.8	2.8	8.5	3	2	3
Kuzucuk	9.8	1.4	2.8	5	1	1
Uğur Böceği İle Kara Kedi	0	4.2	8.5	0	3	3
Pepe	7.8	2.8	0	4	2	0
Akıllı Tavşan Momo	1.9	4.2	0	1	3	0
Pija Maskeliler	0	4.2	2.8	0	3	1
Hapşuu	1.9	2.8	0	1	2	0
İstanbulun Muhafızları	0	2.8	5.7	0	2	2
Diğer	37.2	40	42.8	19	28	15
Toplam	32.6	44.8	22.4	51	70	35

Table 3 shows that 13.7% of 36-48-month-old children preferred Niloya and the Harika Kanatlar and they did not prefer the Uğur Böceği and Kara Kedi, Pijamaskeliler and İstanbul Muhafızları cartoons. It was concluded that 11.4% of 48-60-month-old children preferred Niloya and 1.4% preferred Kuzucuk. Furthermore, 8.5% of 60-72-month-old children preferred Pepe, Akıllı Tavşan Momo and Hapşuu, while Keloğlan, Uğur Böceği and Kara Kedi were not preferred.

CONCLUSION AND DISCUSSION

According to the results of the research, which aimed to determine which cartoons are most frequently watched by preschool children, 10.8% of the children preferred Niloya, 9.6% preferred Harika Kanatlar and 6.4% preferred Rafadan Tayfa. The Akıllı Tavşan Momo, Pijamaskeliler, Hapşuu and the İstanbul Muhafızları were found to be watched by 2.5%. It has been reported that the Keloğlan, Pepe and Niloya cartoons are associated with a higher percentage of students with positive behavioural characteristics (Özsevgeç & Saka, 2016). In another research study done in a grid of 25 families, it has been observed that children decide which cartoon to watch and that many participants do not watch cartoons together with their children, rather, they minded their own business (Yetim ve Sarıçam, 2016).

It was found that 20.3% of girls and 4.3% of boys preferred Niloya. In terms of the Harika Kanatlar cartoon, it was found that 15.2% of boys preferred the cartoon compared to 1.5% of girls.

In a research study conducted, three different TV channels whose target audience are children (Disney Channel, Cartoon Network and Nickelodeon) have been analysed and at the end of the study, regardless of the gender of the target audience, the heroes on the shows shown on the channels are male with the percentage of 66% (Hendges ve Case, 2017). In Wonderful Wings cartoon, the emphasis of the difference between male and female chores (cleaning, cloth washing etc.) is seen, and it is also highlighted that since the chores of girls are bothersome, boys should respect them (Yaralı, & Avcı, 2017).

It was found that 13.7% of the 36-48-month-old children preferred Niloya and the Harika Kanatlar cartoon, while they did not show a preference for the Uğur Böceği

and Kara Kedi, Pijamaskeliler and the İstanbul Muhafızları cartoons. It was concluded that 11.4% of 48-60-month-old children preferred Niloya and 1.4% preferred Kuzucuk. Moreover, 8.5% of 60-72-month-old children preferred Pepe, Akıllı Tavşan Momo and Hapşuu, while Keloğlan and Uğur Böceği and Kara Kedi were not preferred. It is known that children of different age levels reflect the characteristics of their favourite cartoon heroes in their daily lives (Yetim & Sarıçam, 2016; Pedagogical Association, 2016).

SUGGESTIONS

The following suggestions can be made, following the evaluation of the results and the literature:

- Parents need to be selective and take a conscious approach, as children cannot understand certain situations in the cartoons they watch.

- Since the children's channels broadcast 24 hours a day, they can broadcast the same cartoons several times on the same day to fill the broadcast time. It is seen that the majority of the cartoons in the children's channels are foreign productions and the number of domestically produced cartoons is insufficient (Özen & Kartelli, 2017). It is suggested that the number of domestically produced cartoons should be increased and their qualifications should be improved, with the aim of promoting our cultural values (Özsevgeç & Saka, 2016).

- It is suggested that parents should not leave their children alone for a long time with TV due to the fact that they do not know the content and that the content may have negative effects like increasing the aggressive behaviour etc., that they should be informed about the content of the cartoons, and

they should be able to present explanations about the issue if necessary (Soydan, Alakoç pirpir, & Azak 2017, Fisch, Akerman, Morgenlander, McCann Brown, Fisch, Schwartz, & Tobin, 2008).

- It is thought that cartoon producers should prepare the content of cartoons by paying attention to the developmental characteristics of children.

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DEVELOPMENT OF AN ANALYTİCAL MODEL FOR MEASURİNG TECHNİCAL EDUCATİON COMPETENCY USİNG ANP AND TOPSIS

BÖLÜM 10

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Introduction

The traces, evidence and findings of humans in the past show that human beings were constantly striving to improve the quality of life. In order to maintain and facilitate their lives as well as improve their quality of life, they tried to produce what was not provided by nature. They discovered that the things except what nature invention and discovery made it possible for them to acquire what was not provided by nature thus maintained their lives. Although the first inventions of humans on this planet are seen as very simple compared to those of today's, today's inventions were realized as a result of the accumulation of the past. However, this accumulation was achieved thanks to the education that humans invented again as a means of maintaining their existence on this planet and understanding the nature and universe in which they exist. In other words, education activity adopted a role in the making of these inventions and discoveries primary to maintain their life and developing technologies to bring these to life.

Although the term technology is defined in different ways, it is essentially defined as the systematic application efficiency of the information produced in the process or procedures of producing goods and services. In other words, the concept of technology is defined as a set of knowledge and skills that enable efficient and productive activities involving research, development, production, distribution, marketing and after-sales services (Zerenler, Türker and Şahin, 2007). From a functional point of view, it can be said that technology is the application of science (Günay, 2002). Technology is the activity of using theoretical knowledge into action and solving problems (Alpaslan, 2011). In addition to being a set of information that enables product design and production, technology is described as all physical processes and arrangements that convert inputs into outputs (Erdil and Pamukçu, 2015).

When the concept of technology is examined in terms of economics, technology provides competitive advantage by creating efficient production through the creation of differences in production factors and methods. (Malatyalı, 2016). The activities included in the definition of technology are indispensable for human life. However, the continuation of these activities is also vital for humans. (Günay and Çalık, 2019). For this reason, institutions providing VTE at various academic and application levels have been established in order to facilitate human life and improve the quality of life. One of them is VSHEs which provide knowledge and skills to technicians. Such schools play an important role in all societies or countries with different levels of development. Especially today's rapidly changing scientific and technological advances, as in other areas of life, question the appropriateness or competency of VTE. This requires an examination and investigation of the issue of the competency of VTE.

Although the competency of VTE varies according to the development level of the countries in terms of scope and purpose, the main issue is essentially the provision of VTE competency. In other words, it is seen that countries attach importance to ensuring the significance and competency of VTE. It is seen that they have developed and implemented various VTE models for this purpose (Balcı, Çelik and Eldem, 2013). The significant difference in the level of VTE in developed and industrialized countries compared to underdeveloped and developing countries (Peran and Bilir, 2007) can be explained by the intensity of production and research and development (R&D) studies (Ünal and Seçilmiş, 2013; Erdil and Pamukçu, 2015). In other words, the advanced knowledge of developed countries in all areas of life can be found in VTE. Nevertheless, developed countries try to maintain their competency in VTE as well as R&D activities and try to increase the level of VTE further. For this reason, scientific studies are car-

ried out for VTE and they are tried to be implemented. In the literature, it is seen that various scientific studies on the competency of VTE are the subject of research (Adıgüzel and Berk, 2009; Karabulut and Marul, 2011; Sahu, Shrivastava, and Shrivastava, 2013; Tuncer andTanaş, 2019; Özer, 2019; Eskandarıpour, Hajıhosseınnezdah, Alastair, and Hosseınıkhah, 2019).

Although the level of development of the countries varies, the objectives or issues of VTE show similarities (Ömer, 2019), but the main issue is the continuous improvement of VTE competency. In fact, this situation was emphasized in the aims of the studies in the literature (Özer, 2019). In the relevant literature review, there are some unresolved issues about measuring and evaluating the competency of VTE. As with multiple-criteria problems (Cheng and Li, 2007; Chen and Wang, 2010; Karahalios, 2017), the nature of the VTE competency issue requires the analysis of a number of elements and the consideration of the competency of VTE on this basis. As a matter of fact, the findings of the studies in the literature (Tuncer and Tanaş, 2019; Eskandarıpour, Hajıhosseınnezdah, Alıasgarı, and Hosseınıkhah, 2019) showed that the competency of VTE was related to many factors or was influenced by many factors. However, it is important to note that the importance of these factors in VTE competency may vary. Therefore, it is necessary to consider the differences in the importance of the factors in determining the competency of VTE. The extent to which each of the factors determining the competency of VTE is involved in the competency of VTE will be able to be ascertained by such an assessment. In the related literature, one study that prioritized the competency factors of VTE (Eskandarıpour, Hajıhosseınnezdah, Alıasgarı, and Hosseınıkhah, 2019) was found. In the study (Eskandarıpour, Hajıhosseınnezdah, Alicasgarı, and Hosseınıkhah, 2019) prioritization was made with analytical hierarchy process (AHP) technique. However,

AHP technique is not suitable for prioritizing more than nine criteria. On the other hand, theoretically and practically, it can be said that VTE competency factors are numerous. This limitation is overcome by grouping the VTE factors in AHP. However, this approach does not solve the problem in some cases. For example, in cases where there is a problem of homogeneity in terms of content of VTE competency factors, grouping cannot be a solution. Another problem encountered in AHP technique is the scope of prioritization. Prioritization in AHP are made in the context of binary comparisons within groups of factors. In other words, in AHP, the relative importance levels of each factor are calculated with the prioritization process (Saaty, 1980). Weighting factors with such an approach may be appropriate for solving some hierarchical problems (Kim, Jang, and Lee, 2013; Chen and Wang, 2010; Dweiri, Kumar, Khan, and Jain, 2016). In the calculation of competency for VTE, it may not be satisfactory to determine the importance levels by comparing only one of the factors with each other because such an approach is limited only to a calculation based on comparison within the group of factors. However, the importance or weight of VTE factors may differ in terms of internal interactions as well as external criteria. As a matter of fact, the importance levels of the factors affecting the competency of VTE may vary according to the criteria of VTE. For instance, it is not possible to say that the VTE competency factors of a developed economy and the VTE competency factors and objectives of a less developed economy may be the same. Moreover, the objectives of a VTE institution within the same economy or sector may differ. These situations indicate that the academic unit providing VTE may have various objectives. For example, vocational schools of higher education or faculties may have various objectives such as gaining academic competence, job placement, competing and branding. Therefore, the competency of VTE needs to

be evaluated according to the objectives of the VSHE or faculty. This necessitates the consideration of the differences in objectives in determining the competency of VTE. Another point is that the importance of the objectives of the VSHE or faculty as an educational institution may differ. In this case, the relative importance of the objectives of the educational institution should be considered in determining the competency of VTE. Another point that should be mentioned here is that when considered as content, one of the objectives is often not independent of one another. In other words, the interactions of objectives may be possible. For instance, it is unthinkable that the quality education objective of a school offering VTE is independent of the job placement or branding objective. Therefore, an approach that takes into account the interaction and relationship of the objectives should be used in the evaluation of the VTE competency issue. Another issue that needs to be expressed is the evaluation of the competency of VTE in a holistic approach relying on the priorities determined in the context of the objectives of the school.

No studies were encountered in the literature examining the competency of a VSHE or faculty providing VTE by considering the above-mentioned issues. This study intends to suggest a model for evaluating the competency of a VSHE which provides education and training in the field of VTE with a holistic approach.

Method

This study utilized ANP and TOPSIS techniques in the development of the suggested model for measuring and evaluating the competency of VTE. Analytic network process (ANP), which is one of the multiple-criteria decision-making techniques, is a technique allowing the calculation of the degree of possible relationships between the criteria contained in multidimensional problems. ANP was

developed mainly on the basics of analytic hierarchy process (AHP). ANP was brought to the literature as a result of the pioneering work of Saaty (Saaty and Takizawa, 1986; Saaty, 1996; Saaty, 1999). ANP allows the calculation of priorities of decision problems with one-way non-hierarchical relationships. In other words, it can make a prioritization considering the dependencies between the criteria of the decision problem. The main difference between AHP and ANP is that ANP is able to calculate composite weights by means of supermatrix which was developed by considering the interrelationships between factors or levels in the model (Shyur, 2006). Supermatrix is a partitioned matrix. Each sub-matrix shows the relationships between two components or clusters in a network structure (Shyur, 2006). Saaty (1996) described the concept of supermatrix in a similar way to the Markov chain process. In this study, the formation of supermatrix was created according to the concept of Saaty and Takizawa (1986). This is because, as Shyur (2006) stated, it has an easier processing. In the relevant literature, it was seen that the procedures for the ANP was explained in various manners and steps (Saaty, 1996; Chung, Lee, and Pearn, 2005; Shyur, 2006; Cheng and Li, 2007; Lee, Kim, Cho and Park, 2009). In this study, the steps of ANP procedures explained by Shyur (2006) were used. These steps are as follows:

Step 1: Binary comparisons of criteria in the context of non-dependence. Decision makers make a pairwise comparison of the criteria in the model. In this study, the competency objectives of VTE were expressed as criteria in ANP model. The expert group answered the following question in comparing the criteria: "Which objective is more important in terms of VTE competency and how important is it? The answers of the expert group were given according to the Saaty's 1-9 (Saaty, 1980) scale (Table 1). Each pair of criteria is judged once. The reciprocal value is the opposite of the comparison. When the binary compari-

sons are completed, the local weights (w_1) vector are found with the $\mathbf{A}w_1 = \lambda max w_1$ equation. The term λ_{max} in the equation denotes the largest eigenvalue of the binary comparison matrix **A**. The resulting vector is normalized. For this, each value is divided by the column total to symbolize the standardized local weight vectorw_2 (Shyur, 2006).

Table 1. *Levels of Importance in Binary Comparisons*

a_{ij}	Definition
1	Equal importance
3	Weak importance
5	Strong importance
7	Very strong importance
9	Extreme importance
2,4,6,8	Intermediate values

In ANP, it is expected that the pairwise comparisons of the criteria constituting the problem are consistent. Therefore, consistency ratios of binary comparison matrices are calculated. The consistency calculation is determined by calculating the inconsistency of the binary comparison matrix. Primarily, the consistency index (C.I.) is calculated to find out the consistency ratio (C.R.). Consistency index is acquired through C.I. = $(\lambda_{max}–n)/(n-1)$ equation. The term "n" in the equation indicates the size of the square matrix. Upon calculating the consistency index, the inconsistency index is calculated through (C.R.), (C.R.) = (C.I) / (R.I) equation. The size of the comparison matrix determines the random consistency index (R.I.) value in the equation (Kim, Jang, and Lee, 2013; Deng, Hu, Deng, Mahadevan, 2014). The consistency ratios of the comparison matrices vary according to the size of the matrix (Konstantinos, Georgios, and Garyfalos, 2019) however, if the inconsistency rate is less than 0.10 when the size of the matrix is $n \geq 5$, the matrix is consistent. Otherwise, if the binary com-

parisons are found to be inconsistent, the binary comparisons are repeated (Dweiri, Kumar, Khan, and Jain, 2016).

Step 2: Determination of interdependence between criteria. The expert group examines the impact of each criterion on the other. This is done through binary comparison. The question asked in the binary comparison for this study was: Which VTE competency objective affects the objective of other VTE competency included in the model? And to what extent does it affect? Decision makers answer this question. Various binary comparison matrices are created for each VTE competency objective. Binary comparison matrices are needed to determine the relative effects of dependent relationships of criteria. For these matrices, normalized principal eigenvectors are calculated. In the interdependence weight matrix of criteria B, where zeros are appointed to the eigenvector weights of the criteria from which a given criterion is given, the calculated eigenvectors are shown as a column element.

Step 3: Calculation of dependence priorities of criteria. In this step, the dependence priorities of the criteria are calculated by synthesizing the results of the previous two steps: $w_c = B^{T}_{2}$.

Technique for Order Performance by Similarity to Ideal Solution (TOPSIS) was the second multiple-criteria decision-making technique employed in this study. TOPSIS was developed by Hwang and Yoon (1981). The main feature of the TOPSIS technique is its ability to rank and prioritize multiple alternatives according to multiple criteria. In TOPSIS method, the optimal alternative is determined as closest to positive ideal solution and farthest away from negative ideal solution (Walczak and Rutkowska, 2017). In the related literature, it is seen that TOPSIS technique was used in various multiple-criteria issues (Dağdeviren, Yavuz and Kılınç, 2009; Ding and Zeng, 2015; Karahalios,

2017; Meng, Shao, and Zhu, 2018;Pelegrina, Duarte, and Romanoa, 2019; Konstantinos, Georgios, and Garyfalos, 2019; Ramya and Devadas, 2019).Shyur (2006) The procedures for the TOPSIS technique are demonstrated below:

Step 1: *Formation of decision matrix.* The structure of the decision matrix is as follows:

$$D = \begin{array}{c} \\ A_1 \\ A_2 \\ \vdots \\ A_i \\ \vdots \\ A_j \end{array} \begin{array}{c} \begin{array}{cccccc} F_1 & F_2 & \cdots & F_j & \cdots & F_n \end{array} \\ \begin{bmatrix} f_{11} & f_{12} & \cdots & f_{1j} & \cdots & f_{1n} \\ f_{21} & f_{22} & \cdots & f_{2j} & \cdots & f_{2n} \\ \vdots & \vdots & \cdots & \vdots & \cdots & \vdots \\ f_{i1} & f_{i2} & \cdots & f_{ij} & \cdots & f_{in} \\ \vdots & \vdots & \cdots & \vdots & \cdots & \vdots \\ f_{m1} & f_{m2} & \cdots & f_{mj} & \cdots & f_{mn} \end{bmatrix} \end{array}$$

A_j in the matrix denotes the alternatives to the problem. With i = 1,m; and F_J terms show the properties and criteria, j = 1, . . . ,n. The term f_{ij} is a crisp value. This value is determined by the comparison of each alternative A_i and each criterion F_j.

Step 2: *Calculation of the standardized decision matrix.* The normalized value is computed utilizing the following equation: $r_{ij} = \frac{f_{ij}}{\sqrt{\sum_{j=1}^{n} f_{ij}^2}}, j = 1, \ldots, n; \quad i = 1, \ldots, m.$

Step 3: *Calculation of the weighted normalized decision matrix.* This is computed by multiplying the weights of the normalized decision matrix. The weighted normalized values () are computed using: =, ; , . The weight of j. property or criterion is demonstrated through this equation.

Step 4: *Identification of ideal and negative ideal solutions*. The benefit criterion is displayed by J and the cost criterion is shown by J', which follows as:

$$V^+ = \left\{v_1^+, \ldots, v_n^+\right\} = \left\{\left(\max_i v_{ij} \middle| j \in J\right), \left(\min_i v_{ij} \middle| j \in J'\right)\right\}$$

$$V^- = \left\{v_1^-, \ldots, v_n^-\right\} = \left\{\left(\min_i v_{ij} \middle| j \in J\right), \left(\max_i v_{ij} \middle| j \in J'\right)\right\},$$

Step 5: *Calculation of separation measurements through m-dimensioned Euclidean distance.* Separation for each alternative from the ideal solution $\left(D_i^+\right)$ is done as follows:

$$D_i^+ = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^+)^2}, ,$$

Likewise, separation of each alternative from the negative ideal $\left(D_i^-\right)$ is calculated as follows:

$$D_i^- = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^-)^2},$$

Step 6: *Calculation of the relative distance to the ideal solution and identification of order of choices.* $C_i = \dfrac{D_i^-}{D_i^+ + D_i^-}$, . C_i A value between 0 and 1 is assigned to the index value. Better performance alternatives are demonstrated by indexes with large values.

In the light of the information above, the steps of the proposed model in this study are as follows:

Step 1. Formation of expert team.

Step 2. Determination of competency factors of VTE.

Step 3. Describing the objectives of the VSHE.

Step 4. Establishing a binary comparison matrix to determine the weights of the objectives of the VSHE.

Step 5. Ranking the VTE competency factors according to the objectives and calculating their weights through TOPSIS technique.

Step 6. Calculation of the competency level of VTE.

Step 7. Determination of deviations from the competency level of VTE.

Results

In this study, the results of the model for measuring and evaluating the competency of VTE were presented in this section in accordance with the steps given in the method section. Accordingly, the results of the study were given in six steps.

Step 1. Formation of the expert team. In this step of the study, a team was formed that provided the data and opinions required for the research. In this study, the expert group consisted of an instructor working in the VSHE, the researcher of the study and an experienced instructor working in a VSHE.

Step 2. Determination of competency factors of VTE. In this step, VTE competency factors in the model of the study were determined. Firstly, the studies on the subject of quality of VTE studies in the literature (Sahu,

Shrivastava, and Shrivastava, 2013; Eskandarıpour, Hajıhosseınnezdah, Alıasgarı, and Hosseınıkhah, 2019) were examined. The factors identified in the studies in the relevant literature were selected by the expert team based on the opinions of the director at the VSHE where the research was conducted. As a result of these procedures, 43 factors determined for the VSHE within the scope of the research are as follows:

- Communication skills of instructors
- Instructors' effectiveness for student participation and collaboration
- Instructors' use of nonverbal skills
- Instructors' presentation skills
- Instructors' good command of course subjects
- Instructors' ability to explain, interpret and examine
- Instructors' ability to use examples
- Instructors' ability to encourage student learning
- Instructors' ability to use appropriate teaching strategies
- Quality of teaching method of instructors
- Classroom management skills of instructors
- Instructors' maintenance of classroom order
- Starting and finishing courses on time by instructors
- Checking students' attendance
- Determining the readiness of students for vocational education

- Optimal use of time
- Educational evaluation skills of instructors
- Quality of exams in terms of validity, reliability and feedback
- Consistency of course content with exam methods
- Educational material
- Information and communication service
- Library reference resources, journals, etc.
- Internet and original databases
- Physical organization of classroom environments
- Culture of faculty / VSHE
- Consultancy services
- Instructors' job satisfaction
- In-service training of non-academic staff
- Area of faculty/VSHE
- Classroom capacities
- Competency of workshops
- Competency of laboratories
- Quality of laboratory materials
- Quality of health facilities
- Cultural and sports facilities
- • Evaluation process of teaching quality
- Collaboration and networking with institutions

- Exchange programs
- Curriculum design and revision
- Academic planning and monitoring
- Continuous assessment and monitoring
- Convenient working environment
- Accommodation and nutrition

Step 3. Describing the objectives of the VSHE. In this step of the study, the objectives of the VSHE providing technical education were determined. For this purpose, as a result of the interviews conducted with the managers of the VSHE where the study was conducted, quality education, job placement of graduates, competition and branding were determined by the expert group as the objectives of VSHE providing VSHE. Moreover, as emphasized in the problem stated in the introduction part of the study, it is not possible to think that one of the objectives is independent of another. There are possible situations of interaction of objectives. In this study, the interaction of the objectives of the VSHE within the scope of the research was determined by the expert group of the study. Accordingly, the interaction between the objectives determined was given in Figure 1. According to the pattern in Figure 1, it is seen that quality education affects job placement of graduates, branding and competition objectives. The objective of job placement of graduates affects the objective of branding and competition. On the other hand, it is seen that the objective of branding affects the objectives of job placement of graduates and competition. The latest situation in the pattern affects the objective of competition and the job placement of graduates.

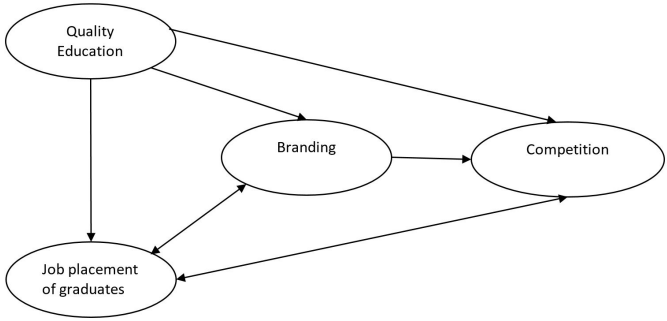

Figure 1. *Interaction between Objectives*

Step 4. Establishing a binary comparison matrix to determine the weights of the objectives of the VSHE. Due to the requirements of ANP's mathematical process (Saaty, 1996; Chung, Lee, Pearn, 2005; Shyur, 2006; Cheng and Li, 2007; Lee, Kim, Cho, and Park, 2009), primarily, the importance of the objectives of the VSHE was calculated for the situation where the factors are independent of one another. For this purpose, primarily, binary comparisons of the objectives were made relying on the expert opinion. Saaty's (1980) scale was used in binary comparisons. Table 2 shows the pairwise comparisons of the objectives and the consistency ratio with the calculated local weights.

Table 2: *Pairwise comparisons of the objectives in terms of independence*

Objectives	QE	JP	BD	CP	Local weights	CR
Quality Education (QE)	*1*	*2*	*3*	3	0.4412	0.05
Job Placement of Graduates (JP)		*1*	*3*	2	0.2898	
Branding (BD)			*1*	2	0.1520	
Competition (CP)				1	0.1170	

Another process performed in the fourth step was to determine the internal dependence matrix. For this purpose, binary comparisons were made based on the relationships

between the objectives in Figure 1. Binary comparisons based on internal dependence were arranged in Tables 3-5. Table 3 shows the pairwise comparisons based on job placement criteria and their local weights and consistency ratios. Pairwise comparisons made according to branding criteria were presented in Table 4 and pairwise comparison of objectives that affect competition was presented in Table 5.

Table 3: *Factors affecting job placement of graduates*

Objectives	QE	BD	CP	Local weights	CR
Quality education (QE)	*1*	*3*	3	0.594	0.05
Branding (BD)		*1*	2	0.249	
Competition (CP)			1	0.157	

Table 4: *Factors affecting branding*

Objectives	QE	JP	Local weights
Quality education (QE)	*1*	*3*	0.750
Job placement of graduates (JP)		*1*	0.250

Table 5: *Factors affecting competition*

Objectives	QE	JP	BD	Local weights	CR
Quality education (QE)	*1*	*2*	*3*	0.528	0.05
Job placement of graduates (JP)		*1*	*3*	0.333	
Branding (BD)			*1*	0.140	

The weights calculated in Table 2-5 above and the dependent weights of the objectives according to the pattern in Figure 1 were given in Table 6. As can be seen in Table 6, dependent weights were calculated by multiplying the weights calculated according to the interaction of the objectives and the weights calculated according to the assumption of non-relationality between the objectives.

Table 6. *Dependent Weights Matrix for Main Factors*

Step

		QE	JP	BD	CP		Non-relational weights		Dependent weights
W=	QE	0.250	0.594	0.750	0.527	X	0.441	=	0,4582
	JP	0.250	0.000	0.250	0.332		0.290		0,1871
	BD	0.250	0.249	0.000	0.140		0.152		0,1988
	CP	0.250	0.157	0.000	0.000		0.117		0,1558

5. Ranking the VTE competency factors according to the* objectives *and calculating their weights through TOPSIS technique. In this step of the study, the ranking of the VTE competency factors and their weights were calculated by TOPSIS technique. The analysis of the TOPSIS technique was based on the objectives of the VSHE. The quality factors of VTE included in the analysis were determined in the second step of the study. The order of importance determined according to the values of TOPSIS analysis was given in the last column of Table 7. The relative weights (sdzCi) were calculated by standardizing the values determined by TOPSIS analysis. The second column of Table 9 shows the standardized C_i values.

Table 7: *Priorities of VTE Quality Factors According to Objectives of VSHE*

Factors	Education 0.4582	Job Placement 0.1871	Branding 0.1988	Competition 0.1558	D^+	D^-	C_i	Rank
Communication skills of instructors	5	2	3	4	0.03863	0.07833	0.66975	8
Instructors' effectiveness for student participation and collaboration	5	2	4	3	0.03778	0.07874	0.67578	6
Instructors' use of nonverbal skills	4	2	3	3	0.04441	0.05905	0.57075	19
Instructors' presentation skills	5	2	3	3	0.04014	0.07757	0.65899	9
Instructors' good command of course subjects	5	2	4	3	0.03778	0.07874	0.67578	7
Instructors' ability to explain, interpret and examine	4	2	2	3	0.04774	0.05853	0.55079	21

Instructors' ability to use examples	5	2	3	2	0.04254	0.07731	0.64505	10
Instructors' ability to encourage student learning	5	4	4	3	0.01882	0.08529	0.81920	1
Instructors' ability to use appropriate teaching strategies	4	3	3	2	0.03874	0.06205	0.61565	13
Quality of teaching method of instructors	5	3	4	4	0.02525	0.08199	0.76455	4
Classroom management skills of instructors	4	2	2	2	0.04977	0.05819	0.53898	23
Instructors' maintenance of classroom order	3	2	2	2	0.05968	0.03974	0.39974	34
Starting and finishing courses on time by instructors	3	3	3	3	0.04885	0.04564	0.48303	27
Checking students' attendance	3	1	2	3	0.06559	0.03854	0.37011	37
Determining the readiness of students for vocational education	4	3	2	3	0.04010	0.06187	0.60675	16
Optimal use of time	3	2	3	3	0.05529	0.04099	0.42578	30
Educational evaluation skills of instructors	4	2	3	3	0.04441	0.05905	0.57075	20
Quality of exams in terms of validity, reliability and feedback	4	2	4	3	0.04229	0.06059	0.58892	18
Consistency of course content with exam methods	4	2	5	4	0.04010	0.06401	0.61480	14
Educational material	4	1	4	4	0.05107	0.06047	0.54211	22
Information and communication service	1	4	5	5	0.07691	0.04600	0.37425	36
Library reference resources, journals, etc.	4	2	5	5	0.03960	0.06554	0.62333	12
Internet and original databases	3	2	4	4	0.05247	0.04454	0.45909	28
Physical organization of classroom environments	3	3	4	4	0.04564	0.04885	0.51697	24
Culture of faculty / VSHE	3	2	3	3	0.05529	0.04099	0.42578	31
Consultancy services	3	4	5	5	0.03974	0.05968	0.60026	17
Instructors' job satisfaction	2	1	3	3	0.07617	0.02150	0.22014	43

In-service training of non-academic staff	2	2	3	3	0.06974	0.02442	0.25938	42
Area of faculty/ VSHE	2	1	4	4	0.07416	0.02767	0.27170	40
Classroom capacities	3	1	3	3	0.06321	0.03932	0.38353	35
Adequacy of workshops	5	3	5	5	0.02316	0.08501	0.78588	2
Adequacy of laboratories	5	3	5	5	0.02316	0.08501	0.78588	3
Quality of laboratory materials	3	2	3	3	0.05529	0.04099	0.42578	32
Quality of health facilities	2	2	4	4	0.06753	0.02999	0.30754	39
Cultural and sports facilities	2	1	4	4	0.07416	0.02767	0.27170	41
Evaluation process of teaching quality	3	2	5	5	0.05150	0.04989	0.49202	26
Collaboration and networking with institutions	2	5	5	5	0.05703	0.05845	0.50616	25
Exchange programs	3	5	5	5	0.03802	0.06709	0.63828	11
Curriculum design and revision	5	2	5	5	0.03474	0.08261	0.70395	5
Academic planning and monitoring	4	2	5	4	0.04010	0.06401	0.61480	15
Continuous assessment and monitoring	3	2	4	4	0.05247	0.04454	0.45909	29
Convenient working environment	3	1	4	4	0.06077	0.04300	0.41443	33
Accommodation and nutrition	2	1	5	5	0.07347	0.03564	0.32665	38

Step 6. Calculation of competency level of VTE. In this step of the study, the VTE competency level of the VSHE within the scope of the research was calculated. An instructor working in the VSHE subject to the study evaluated the current status of each VTE competency factor with the scale provided in Table 8 (Yüksel and Dağdeviren 2006). “For example, what is the favorable working environment?” was the evaluation question. This question was responded by one of the quality levels given in Table 8. For example, the answer given to this question was Average (AR) and 0.6 was the corresponding value.

Table 8. *VTE Competency Evaluation Scale*

Level	Value
Sufficient (SF)	1.0
Good (GD)	0.8
Average (AR)	0.6
Insufficient (IS)	0.4
Very insufficient (VIS)	0.2
Not available(NA)	0.0

The answers given to the questions of an instructor working in the VSHE within the scope of the research were presented in the third column of Table 9. The numerical values corresponding to the answers are in the fourth column of Table 9. In the last column of Table 9, the levels of the VTE competency factors of the VSHE within the scope of the research were given. The sufficiency level (CL) in the last column of Table 9 was calculated by multiplying the standardized values (sdzC i) of the factors and the actual state (AS). In the last line of Table 9, the total competency level of VTE (TCL) calculated for the VSHE within the scope of the research was given. This value can be between 0 and 1 ($0 \leq TCL \leq 1$). The total competency level of VTE calculated for this study was found to be 0.6642.

Table 9. *Calculation of VTE Competency Level*

VTE Evaluation Factors	Standardized C_i Values ($sdzC_i$)	Actual state (AS)	Scale Value (VAS) (Table 5)	Competency Level (CL)=[($sdzC_i$) X (VAS)]
Communication skills of instructors	0.02956	GD	0.8	0.0237
Instructors' effectiveness for student participation and collaboration	0.02983	GD	0.8	0.0239
Instructors' use of nonverbal skills	0.02519	GD	0.8	0.0202
Instructors' presentation skills	0.02909	GD	0.8	0.0233

Instructors' good command of course subjects	0.02983	SF	1	0.0298
Instructors' ability to explain, interpret and examine	0.02431	GD	0.8	0.0195
Instructors' ability to use examples	0.02847	SF	1	0.0285
Instructors' ability to encourage student learning	0.03616	AR	0.6	0.0217
Instructors' ability to use appropriate teaching strategies	0.02718	AR	0.6	0.0163
Quality of teaching method of instructors	0.03375	GD	0.8	0.0270
Classroom management skills of instructors	0.02379	AR	0.6	0.0143
Instructors' maintenance of classroom order	0.01765	GD	0.8	0.0141
Starting and finishing courses on time by instructors	0.02132	AR	0.6	0.0128
Checking students' attendance	0.01634	IS	0.4	0.0065
Determining the readiness of students for vocational education	0.02678	AR	0.6	0.0161
Optimal use of time	0.01880	AR	0.6	0.0113
Educational evaluation skills of instructors	0.02519	GD	0.8	0.0202
Quality of exams in terms of validity, reliability and feedback	0.02600	GD	0.8	0.0208
Consistency of course content with exam methods	0.02714	GD	0.8	0.0217
Educational material	0.02393	AR	0.6	0.0144
Information and communication service	0.01652	AR	0.6	0.0099
Library reference resources, journals, etc.	0.02752	GD	0.8	0.0220
Internet and original databases	0.02027	SF	1	0.0203

Physical organization of classroom environments	0.02282	SF	1	0.0000
Culture of faculty / VSHE	0.01880	AR	0.6	0.0188
Consultancy services	0.02650	AR	0.6	0.0159
Instructors' job satisfaction	0.00972	IS	0.4	0.0058
In-service training of non-academic staff	0.01145	IS	0.4	0.0046
Area of faculty/VSHE	0.01199	SF	1	0.0048
Classroom capacities	0.01693	AR	0.6	0.0169
Adequacy of workshops	0.03469	GD	0.8	0.0208
Adequacy of laboratories	0.03469	GD	0.8	0.0278
Quality of laboratory materials	0.01880	GD	0.8	0.0150
Quality of health facilities	0.01358	IS	0.4	0.0109
Cultural and sports facilities	0.01199	IS	0.4	0.0048
Evaluation process of teaching quality	0.02172	AR	0.6	0.0087
Collaboration and networking with institutions	0.02234	AR	0.6	0.0134
Exchange programs	0.02818	VIS	0.2	0.0169
Curriculum design and revision	0.03107	IS	0.4	0.0062
Academic planning and monitoring	0.02714	IS	0.4	0.0109
Continuous assessment and monitoring	0.02027	IS	0.4	0.0081
Convenient working environment	0.01829	AR	0.6	0.0073
Accommodation and nutrition	0.01442	AR	0.6	0.0087
	1.00000	Total Competency Level (TCL)		0.6642

Step 7. Determination of deviations from the competency level of VTE. In this step of the study, deviations from the VTE competency levels calculated for the VSHE evaluated according to the proposed model were determined. Thus, the competency factors and the level of deficiency of the VSHE within the scope of the research were determined (Table 10). Detailed results of the competency factors of VTE in Table 10. Factors were given in the first column, the calculated relative weights of VTE factors in the second column, competency levels of the factors of VTE of the VSHE within the scope of the study in the third column, and the fourth column displays the deviation values. The difference between weight value and competency level is defined as the deviation value.

Table 10. *Detailed Evaluation of VTE Competency Factors*

Factors	Standardized C_i Values ($SdzC_i$)	Competency Levels (CL)=[($sdzC_i$)X (VAS)]	Deviation ($SdzC_i$)-(CL)
Communication skills of instructors	0.02956	0.0237	0.00591
Instructors" effectiveness for student participation and collaboration	0.02983	0.0239	0.00597
Instructors' use of nonverbal skills	0.02519	0.0202	0.00504
Instructors' presentation skills	0.02909	0.0233	0.00582
Instructors' good command of course subjects	0.02983	0.0298	0.00000
Instructors' ability to explain, interpret and examine	0.02431	0.0195	0.00486
Instructors' ability to use examples	0.02847	0.0285	0.00000

Instructors' ability to encourage student learning	0.03616	0.0217	0.01446
Instructors' ability to use appropriate teaching strategies	0.02718	0.0163	0.01087
Quality of teaching method of instructors	0.03375	0.0270	0.00675
Classroom management skills of instructors	0.02379	0.0143	0.00952
Instructors' maintenance of classroom order	0.01765	0.0141	0.00353
Starting and finishing courses on time by instructors	0.02132	0.0128	0.00853
Checking students' attendance	0.01634	0.0065	0.00980
Determining the readiness of students for vocational education	0.02678	0.0161	0.01071
Optimal use of time	0.01880	0.0113	0.00752
Educational evaluation skills of instructors	0.02519	0.0202	0.00504
Quality of exams in terms of validity, reliability and feedback	0.02600	0.0208	0.00520
Consistency of course content with exam methods	0.02714	0.0217	0.00543
Educational material	0.02393	0.0144	0.00957
Information and communication service	0.01652	0.0099	0.00661
Library reference resources, journals, etc.	0.02752	0.0220	0.00550
Internet and original databases	0.02027	0.0203	0.00000
Physical organization of classroom environments	0.02282	0.0000	0.02282

Culture of faculty / VSHE	0.01880	0.0188	0.00000
Consultancy services	0.02650	0.0159	0.01060
Instructors' job satisfaction	0.00972	0.0058	0.00389
In-service training of non-academic staff	0.01145	0.0046	0.00687
Area of faculty/VSHE	0.01199	0.0048	0.00720
Classroom capacities	0.01693	0.0169	0.00000
Adequacy of workshops	0.03469	0.0208	0.01388
Adequacy of laboratories	0.03469	0.0278	0.00694
Quality of laboratory materials	0.01880	0.0150	0.00376
Quality of health facilities	0.01358	0.0109	0.00272
Cultural and sports facilities	0.01199	0.0048	0.00720
Evaluation process of teaching quality	0.02172	0.0087	0.01303
Collaboration and networking with institutions	0.02234	0.0134	0.00894
Exchange programs	0.02818	0.0169	0.01127
Curriculum design and revision	0.03107	0.0062	0.02486
Academic planning and monitoring	0.02714	0.0109	0.01628
Continuous assessment and monitoring	0.02027	0.0081	0.01216
Convenient working environment	0.01829	0.0073	0.01098
Accommodation and nutrition	0.01442	0.0087	0.00577
Total	1.00000	0.6642 0.33578	

Conclusion

In this study, a model for measuring and evaluating the competency of VTE was proposed. The proposed model was structured with ANP and TOPSIS techniques which are multiple-criteria decision-making techniques. This is mainly due to the multi-dimensional and multiple-criteria nature of the evaluation of VTE competency. As a matter of fact, studies in the related literature (Tuncer and Tanaş, 2019; Eskandarıpour, Hajıhosseınnezdah, Alınasgarı, and Hosseınıkhah, 2019) showed that competency of VTE is a component of many factors. Therefore, it is necessary to evaluate the competency of VTE with the models and techniques appropriate to this feature in terms of reflecting the real situation.

When the results of this study were examined, it was found that the proposed ANP-TOPSIS-based model was suitable for measuring and evaluating the VTE competency. The model proposed in the study has a feature considering the objectives of the VSHE providing VTE. Additionally, the possible interaction between the objectives was considered in the proposed model in the evaluation of the competency of VTE. These two characteristics of the model reinforce the validity of the assessment of the competency of the vocational and technical VSHE since the importance level of each factor of VTE competency can vary according to the objectives of the VSHE. For this reason, it is important to carry out measurement and evaluation by considering the importance levels of VTE competency factors on the basis of objectives. In this study, this issue was considered in the proposed model and the importance of this issue was seen in the results. Consideration of interaction or dependence between objectives is the second factor that increases the validity of the results because it is not possible to think of the objectives independently of each other. One objective may have an effect

on the other objective or objectives. The model proposed in this study considered this issue with ANP technique. Another feature of the study is that it enables to evaluate the competency of VTE in detail. With the suggested model in the study, the level of competency of each VTE factor can be answered. In addition, the level of competency of the proposed model VTE institution as a whole could be determined.

It can be said that the VTE competency evaluation model proposed in the study is applicable in vocational schools. However, the proposed model can be modified and applied in VSHEs that differ in content and number of objectives or factors. It can be said that the model proposed in the study can be used for other types of education. Evaluation can be done by taking the competency factors to be determined for other types of education instead of VTE factors included in the proposed model. Similarly, in the model to be modified, the objectives may vary in number or content. As a result, different types of education can be evaluated by differentiating the relationships between the factors, objectives and objectives that are included in the model to be modified.

In the continuation of this study, further studies may allow to determine the drawbacks of the proposed model or make it suitable for a more valid measurement. In the first of these studies, the relationship between objectives could be determined through DEMATEL technique. Another study that can be done in the future may use fuzzy numbers instead of crisp numbers used in the measurement process. The use of fuzzy numbers may provide a more specific measure of the evaluation of qualitative factors.

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