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Tıp Fakültesi Öğrencilerinin İngilizce Öğrenme Motivasyonları Ölçeğinin Geliştirilmesi

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Bora DEMİR

Dr., Çanakkale Onsekiz Mart University, School of Foreign Languages

Dr. Öğr. Gör., Çanakkale Onsekiz Mart Üniversitesi, Yabancı Diller Yüksekokulu

boradem ir@comu.edu.tr

ORCID: 0000-0001-8187-3206

Bahattin HAMARAT

Lecturer, Çanakkale Onsekiz Mart University, Faculty of Tourism

Öğr. Gör., Çanakkale Onsekiz Mart Üniversitesi, Turizm Fakültesi

b_hamarat@hotmail.com

ORCID: 0000-0002-6745-5785

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Tıp Fakültesi Öğrencilerinin İngilizce Öğrenme Motivasyonları Ölçeğinin Geliştirilmesi*

Öz

Bu çalışma, İngilizce'yi özel amaçlı bir bağlamda yabancı dil olarak öğrenen tıp fakültesi öğrencilerinin dışsal, bütünleyici ve içe yönelik güdülenme değişkenlerini belirleyen bir ölçeği geliştirmeyi amaçlamaktadır. Gardner ve Lambert'in sosyo-eğitim modeli (1972) ve Deci ve Ryan'ın öz-belirleme teorisinden (1985) hareketle, bu çalışma, Noels vd.'nin (2000) içe yönelik, araçlık ve bütünleyici olarak üç ana kategoride sınıflandırdığı güdülenme modeli üzerine dayandırılmıştır. 320 tıp fakültesi öğrencisinin katılımıyla, yeterli iç tutarlılığa sahip 14 maddelik bir güdülenme ölçeği geliştirilmiştir. Çalışmanın ana unsuru olan motivasyon ölçeğinin oluşturulması için dört farklı yöntem kullanılmıştır. İlk olarak, rastgele seçilmiş 7 tıp fakültesi öğrencisinin katılımıyla bir odak grup görüşmesi yapılmış ve görüşmenin kör analizi sonucunda araştırmacılar tarafından belirlenen 22 madde en az on yıl tecrübeye sahip beş tıp doktoruna görüşleri için gönderilmiş ve geri dönütler neticesinde 6 madde havuzdan çıkarılmıştır. Bir sonraki adım olarak, ilgili alanyazın incelenmiş ve mevcut ölçekler arasında karşılaştırmalar yapılmıştır. Son olarak ise ilgili alandan 3 Özel Amaçlı İngilizce (ESP) uzmanının görüşlerine dayanılarak araçsal güdülenme yerine dışsal güdülenme kavramı kullanılarak çalışmanın kuramsal altyapısı tamamlanmış ve 16 maddelik bir ölçek elde edilmiştir. Ölçekteki tüm maddeler "tamamem katılmıyorum" ve "tamamen katılıyorum" arasında sıralanan beşli Likert tipinde düzenlenmiştir. Verilerin analizinde Keşfedici Faktör Analizi (EFA) ve Doğrulayıcı Faktör Analizi (CFA) istatistiksel yöntemleri kullanılmıştır. Motivasyon ölçeğinin yapı geçerliliğinin ortaya çıkarılması için Temel Bileşenler Faktör Analizi uygulanmıştır (PCA), ve rotasyon metodu olarak Direct Oblimin with Kaiser Normalization yöntemi tercih edilmiştir. Örneklemin yeterliliğini hesaplamak için ise Kaiser-Mayer-Olkin (KMO) katsayısı hesaplanmıştır. Son olarak ölçekte yer alan ifadelere yönelik faktör yapılarının elde edilmesinde yararlanılan korelasyon maddesinin birim matris olup olmadığı Barlett Küresellik testi ile incelenmiştir. EFA için yapılan tüm istatistiksel işlemlerde norm değerlerinin sağlandığı tespit edilmiş ve 3 faktörlü yapı ortaya çıkarılmıştır. Bu üç faktörün toplam varyansın %64.62'sini açıklamıştır. Sonuç olarak, bu çalışma, tıp fakültesi öğrencileri için istatistiksel olarak geçerli ve güvenilir olan yeni bir veri toplama aracı ortaya koymaktadır.

Anahtar Kelimeler: Yabancı Dil Öğrenme Motivasyonu, ESP, EMP, Ölçek Geliştirme, Tıp Fakültesi Öğrencileri.

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Development of a New Language Learning Motivation Scale for Medical Students*

Abstract

This study aims to develop a scale determining the extrinsic, integrative, and intrinsic factors that motivate medical students learning English as a foreign language in an ESP context. Derived from Gardner and Lambert's socio-educational model (1972) and Deci and Ryan's self-determination theory (1985), the study is based on the motivational framework of Noels et al. (2000) which categorizes the three main motives as intrinsic, instrumental and integrative. With the participation of 320 medical students, a 14-item scale was developed with satisfactory internal consistency. Four different methods were used to create the motivation scale. First, a focus group interview was conducted with the participation of randomly selected medical students, and 22 items were determined as a result of the content analysis and were sent to five medical doctors for their opinions, and 6 items were removed from the pool upon their feedback. Next, the literature was reviewed and comparisons were made between existing scales. Finally, based on the opinions of 3 English for Specific Purposes (ESP) experts from the field, the concept of extrinsic motivation was used instead of instrumental motivation, and a 16-item five-point Likert type scale was decided. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) statistical procedures were also utilized. Principal Components Factor Analysis (PCA) was applied to reveal the construct validity of the motivation scale, and Direct Oblimin with Kaiser Normalization method was applied as the rotation method. In order to calculate the adequacy of the sample, the Kaiser-Mayer-Olkin (KMO) coefficient was calculated. Finally, as a result of Bartlett sphericity tests to detect correlations between the items, it was determined that the norm values were provided for all statistical processes for the 3-factor structure explaining 64.62% of the total variance. Finally, this study presents a new data collection tool that is statistically valid and reliable to measure medical students' motivational factors.

Keywords: Foreign Language Learning Motivation, ESP, EMP, Scale Development, Medical Students.

Introduction

Learning a foreign language is important for most professions, but as a result of globalization and various socio-economic factors, doctors need to speak a foreign language more than ever, since their occupation requires effective communication with all parties involved in the medical profession (Ferguson, 2013). Generally referred as

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Learning English for Medical Purposes (EMP), EMP can be defined as "…the teaching of English for doctors, nurses, and other personnel in the medical profession" (Maher, 2008, p.1). Medical doctors need to learn English for several reasons, such as professional development, personal development and integrative purposes. Hence, understanding the language learning motives of medical students is fundamental for language teachers and institutions in designing EMP courses, developing instructional materials, and modifying their curriculum according to the changing needs of these professionals. In this respect, this study aims to develop a language learning motivation scale that is tailored specifically for medical students learning English as a foreign language.

As discussed throughout the paper, the theoretical framework of this study is not based on a single model of motivation. This is because of the complex and multidimensional structure of learning motivation covering personal and integrative motives for ESP learners. Although most of the recent proposed models of motivation focus on intrinsic and extrinsic motives for learning a foreign language, the integrative dimension of motivation has become essential as a result of political, economic, and global changes in today's world. As a result, this study hypothesizes a three-factor professional language learning motivation scale for medical students as intrinsic, extrinsic (instrumental), and integrative.

Definition and Theories of Motivation

Along with several other factors, motivation is central to understanding the reasons for the behaviors of language learners by affecting their engagement and persistence in language learning (Muir, 2022). Based on the idea that motivation is one of the major determinants in comprehending the underlying factors for foreign language (FL) and second language (L2) learning, investigating the role of language learner motivation has been the focus of a vast body of research (Dörnyei, 1994).

As described by Ryan and Deci (2000, p. 54), "To be motivated means to be moved to do something. A person who feels no impetus or inspiration to act is thus characterized as unmotivated, whereas someone who is energized or activated toward an end is considered motivated". By putting emphasis on the cognitive aspect of motivation, Dörnyei and Otto (1998, p. 65) define the term as "the dynamically changing cumulative arousal in a person that initiates, directs, coordinates, amplifies, terminates, and evaluates the cognitive and motor processes whereby initial wishes and desires are selected, prioritized, operationalized and acted out".

By postulating that language learning motivation is a complex and composite construct, motivation to learn a FL or SL is a robust predictor in explaining. Dörnyei (2001, p. 4) defines the term as "the choice of a particular action, the persistence with it, and the effort expended on it". As a commonly-accepted conceptualization, Dörnyei and Ushioda (2011, p.4) define motivation as an inner drive that "concerns the direction and magnitude of human behavior.

As a multidimensional concept, motivation can be manipulated by numerous cognitive, social and environmental factors. Hence, the related literature includes several theories that approach the concept from different contextual perspectives. As one of the earliest

frameworks, Atkinson's Achievement Motivation Theory postulates that individuals with high need of achievement are more motivated and are more likely to succeed (Atkinson, 1966). Following that, Weiner (1974) developed the Attribution Theory, focusing on how people perceive events and why they behave accordingly. According to Weiner, the success or failure perceptions of individuals determine the effort that they spend on a particular action. Weiner proposed that the most common attributions were luck, ability, effort, mood, help or hindrance from others.

Based on the Social Cognitive Theory, Bandura (1986) defined motivation by proposing the concept of Self-Efficacy. He defined motivation as an individual's desire to achieve a certain goal, while self-efficacy is based on an individual's belief in their own capacity to achieve a goal. According to Bandura, self-efficacy helps individuals to make judgments about their capabilities to carry out certain tasks. Therefore, individuals can produce the desired results by their persistence and actions to achieve any target behavior (Bandura, 2001).

Another theory of motivation, proposed by Locke and Latham (1990), is the Goal-Setting Theory, based on the idea that when individuals set certain goals they strive for a higher performance (Locke & Latham, 1990). Following that, the Goal-Orientation Theory, a social-cognitive theory of achievement motivation by Ames (1992), was proposed to explain learner performance in academic contexts by setting learning and performance goals. Unlike the aforementioned theories of motivation, the Goal-Orientation Theory focuses on the reasons why students engage in academic tasks rather than just examining learners' beliefs about their successes and failures (Dörnyei and Ushioda, 2011).

Although the above-mentioned mainstream theories of learning motivation have several different perspectives in defining and conceptualizing the concept of motivation, they mainly focus on the role of individuals' inner motives to engage and accomplish social, cognitive and affective tasks. However, according to Dörnyei and Ushioda (2011, p. 39), the motivation to learn a second language (L2) or foreign language (FL) has become "a largely independent research field, originating in a concern to address the unique social, psychological, behavioral and cultural complexities that acquiring a new communication code entails".

L2/FL Motivation Research

The earliest studies on the role of motivation in L2/FL learning environments were pioneered by Gardner and Lambert (1972). The social-educational model of language learning is based on the idea that learning an additional language of another community depends on the intercultural communication between the learners and the target language's speaking community; "…unlike several other school subjects, a foreign language is not a socioculturally neutral field but is affected by a range of sociocultural factors such as language attitudes, cultural stereotypes, and even geopolitical considerations" (Dörnyei, 2005, p. 67). The social-educational model of language learning proposes two major motivation orientations for language learning, labeled as *integrative* and *instrumental*. Gardner and Lambert define instrumental motivation as "a desire to gain social recognition or economic advantages through knowledge of a foreign language", and integrative motivation as "a desire to be a representative member of the

other language community" (1972, p. 14). Gardner further defines the integrative motive as "…motivation to learn a second language because of positive feelings towards the community that speaks the language' (Gardner, 1985: p. 82). A vast body of empirical research on learning motivation revealed that integratively motivated learners were better language learners when compared to those who are instrumentally motivated (Gardner, 1985).

However, starting from the early 1990s, the existing theoretical framework of the socio-educational model has been criticized for being two-dimensional and failing to explain other motivational aspects of L2 and FL learning (Dörnyei & Ushioda, 2011). Hence, additional concepts were proposed by several researchers to explain the complex and multi-dimensional construct of learner motivation. The theoretical framework of the socio-educational model was expanded by Deci and Ryan (1985) by incorporating additional variables such as autonomy, relatedness, and competence. Based on the humanistic psychology, focusing on various types of intrinsic and extrinsic motives, the self-determination theory claims that motivation is modified or activated by self-determined and controlled forms of motivation to regulate their behavior in line with their sense of self (McEown et al., 2014). According to Deci and Ryan (1985), individuals can be intrinsically or extrinsically motivated with reference to different goals or reasons that trigger them to perform certain behaviors. They make the distinction between the two terms:

> …we distinguish between different types of motivation based on the different reasons or goals that give rise to an action. The most basic distinction is between intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome. (Deci & Ryan, 1985, p. 55)

Nevertheless, with the aim of observing how the self-determination theory works in the language classroom, systematic research has been made by a group of researchers pioneered by Kim Noels (Dörnyei, 2005). To find out language learners' orientations, Noels et al. (2000) developed a questionnaire to measure different perspectives of motivational concepts initially proposed by Deci and Ryan (1985). As a result of extensive research, the self-determination theory evolved by including different perspectives in the language learning motivation framework (Noels, 2001a, 2001b; Noels et al., 2000, 2001). The findings of empirical research showed that the instrumental motive proposed by the socio-educational model highly corresponded to the external regulation of the self-determination theory (Noels et al., 2000; Dörnyei, 2005).

Table 1
Various models of motivation

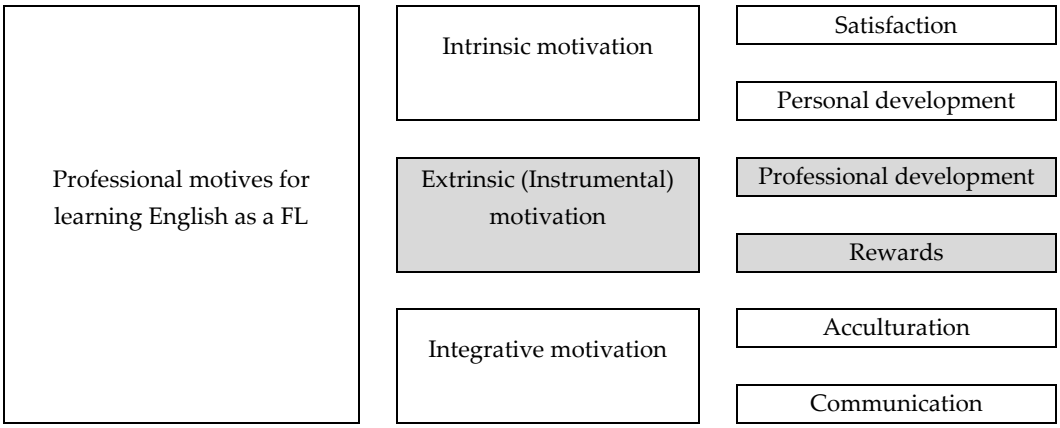
Motivational Framework	Gardner & Lambert (1983)	Deci & Ryan (1985)	Dörnyei (1994a)	Noels et al. (2000)	Ushioda (2001)	Dörnyei (2005)	Present study
	Integrative	Intrinsic motivation	Language level	Intrinsic motivation	Actual learning process	L2 Learning experience	Intrinsic motivation
	Instrumental	Extrinsic motivation	Learner level	Extrinsic motivation	External pressures	Ought-to L2 self	Instrumental motivation
		Amotivation	Learning situation level	Integrative motivation	Integrative dimension	Ideal L2 self	Integrative motivation

As a result of the findings that drew connections between Gardner's and Deci and Ryan's models, Noels et al. (2000) developed a new model including three categories that emerged as a combination of both models. The first motive comprises intrinsic motives such as learning a language because it is fun or engaging. The second motive includes extrinsic motives such as external pressures (instrumental orientation in the socio-educational model). The last category is composed of integrative motives such as the desire to make contact with people speaking the target language or becoming a part of this group (Dörnyei, 2005). Table 1 presents the evolution of various motivation models in chronological order.

Theoretical Model of the Study

As discussed in the previous section, this study is based on three models of motivation due to its contextual orientation (Gardner & Lambert, 1972; Deci & Ryan, 1985; Noels et al., 2000). With the aim of developing a scale measuring the language learning motivation of medical students, the present paper specifically focuses on the professional motives of the university students learning English for specific purposes (ESP).The theoretical framework is based on the Noels et al. (2000) model that constructs a bridge between the initial model of Gardner and Lambert' socio-educational model including integrative and instrumental notions (1972) and Deci and Ryan's self-determination theory with extrinsic and intrinsic categorization. Also, as shown by empirical research (Noels, 2001; Noels et al., 1999, 2000, 2001), we consider the external regulation of the self-determination theory and the instrumental motive proposed by socio-educational model as unitary constructs (Dörnyei, 2005). Figure 1 visualizes the theoretical framework of the present study based on the model.

Figure 1
Motivation model of the present research



As presented in Figure 1, the motivational framework of the study is based on three motivational factors. The first factor, intrinsic motivation, focuses on the individual satisfaction and self-development of learning English as a FL. Although intrinsic motivation generally refers to behaviors in order to experience the joy and satisfaction of performing a particular action, Vallerand (1997) extended the notion by proposing three subtypes of intrinsic motivation. According to Vallerand, individuals may perform an action to learn something for the feeling of accomplishment, to cope with challenges, or to experience pleasant sensations.

The second factor comprises the instrumental motives of learning English as a medical student. Gardner's instrumental motivation refers to learning an additional language to get a better job or a higher income (Gardner, 2005). In other words, instrumental orientation enables the learners to draw a direct relationship between an academic task and the accomplishment of personal goals (Dörnyei & Ushioda, 2011).

Finally, the last factor, integrative motivation, is related to the use of language for communication and integration with people from other countries as prospective medical doctors. Gardner (2005, p.7) defines integrativeness as "an individual's openness to taking on characteristics of another cultural/linguistic group". Therefore, in our context, we assume that prospective doctors may have the motivation to work abroad and to consider learning English as a medium of integration and communication, there by joining the workforce in another country. As a result, the framework of this study covers the types of motivation from an ESP perspective, with a particular focus on the professional motives of medical students.

Motivation Measurement Scales

Motivation has been measured by a large number of scales (Clément et al., 1994; Noels et al., 2000; Dörnyei & Csizér, 2002; Dörnyei, Csizér & Németh, 2006; Guilloteaux & Dörnyei, 2008; Taguchi, Magid, & Papi, 2009; Dörnyei, 2005; Dörnyei, 2010; You, Dörnyei, & Csizér, 2016). However, the Attitude Motivation Test Battery (AMTB) developed by Gardner as a self-report instrument is one of the most widely-used tools for measuring language learning motivation. As a multi componential motivation questionnaire, AMTB

is composed of 104 items under 12 categories, some of which are designed to measure language learning attitudes and the English class anxiety of learners. The scales that measure motivation are: the learners' interest in a foreign language, integrative orientation, instrumental orientation, parental encouragement, and motivational intensity. The AMTB is based on the integrative and instrumental factors and it is often criticized for its dualistic approach to motivation. As discussed earlier in the Introduction section, integrative orientation refers to the feeling of being part of the target language speaking community, while instrumental orientation covers the pragmatic advantages of learning an additional language (Dörnyei & Ushioda, 2011, p.41).

However, despite its dominance, the model has also been criticized for its limited purpose and definition of motivation (Au, 1988; Crookes & Schmidt, 1991; Skehan, 1989). According to Crookes and Schmidt (1991), language learning orientations should be discussed on a broader scale and should include dimensions like interest, relevance, expectancy, and satisfaction. In a similar sense, Ushioda (1996) suggests that the requirement of measuring intrinsic motivation based on personal emotions for language learning must be included. Derived from such concerns, Noels et al.'s (2000) Language Learning Orientations Scale was developed with reference to both intrinsic and extrinsic motives for language learning. Following that, Dörnyei (2005) proposed his Framework of L2 Self-System, covering L2 learning experience, ought-to L2 self, and ideal L2 self.

Based on the theoretical background of Deci and Ryan's self-determination theory (1985), Vallerand et al. (1989) developed the Academic Motivation Scale (AMS) as a new measure of motivation toward learning in general. With its 28 items, the AMS comprises seven subscales assessing amotivation along with three types of intrinsic motivation and three types of extrinsic motivation (Vallerand et. al, 1992; 1993). However, it is crucial to note that the AMS does not cover integrative motives for learning since it aims to measure the motivation level of students and their self-perceptions for engaging in a learning activity (Vallerand et al., 1989).

As discussed above, although several studies have provided findings of EFL learners from various educational contexts, little attention has been paid to developing a framework that is specific to finding out the occupational factors of medical students studying ESP. Hosseini and Shokrpour (2019) investigated the motivating factors that affect Iranian medical EFL students by a motivation questionnaire with 35items, which was developed based on Dörnyei's framework of L2 self-system. Although the authors mention that the reliability and internal consistency of the instrument was calculated as a result of factor analysis, the study does not present any statistical details regarding the values as evidence.

A study by Marosan and Markovic (2019) investigated the instrumental and integrative motivation of first year medical students by using an anonymous questionnaire. However, the paper did not present any statistical analysis regarding the reliability and validity of the instrument.

More recently, Pavel (2020) investigated university students' intrinsic and extrinsic motivation to learn English for Medical Purposes. The study analyzed the effect of

motivation on shaping the learning behaviors during and outside the class language learning tasks. The author developed a 20-item questionnaire including questions about the students' motivation and their learning strategies. However, the author does not report any findings related to development of the questionnaire.

The review of the abovementioned studies suggests that, although there have been several attempts to measure EMP students' motives for learning English, they failed in developing a valid and reliable instrument. Hence, this study aims to fill a gap in the related literature by providing a three dimensional language learning motivation scale that focuses on the professional language learning motivation of university students enrolled on an ESP course. The following research question is addressed:

1. What are the factors that explain the language learning motivations of medical students?

Method

The Study Group

The participants of the study comprise the 1st and 2nd year undergraduates majoring at the Faculty of Medicine, Çanakkale Onsekiz Mart University, Turkey. The participants' ages ranged between 19 and 22. Based on an institutional proficiency exam, they are regarded as B1 level EFL learners. The participants have to take a 14-week compulsory 2-hour ESP course for both semesters in the first and the second year. The pilot study and the main study were conducted during the 2020-2021 academic year.here were 320 volunteer respondent students in the study group (175 female, 145 male). Table 2 presents participant distribution by gender.

Table 2

Participant distribution by gender

	Female		Male		Total	
	f	%	f	%	f	%
1st year students	90	51.4	85	48,6	175	100
2nd year students	85	58.6	60	41,4	145	100

Procedures for the Development of the Motivation Scale

The present study is based on the scale development procedures suggested by DeVellis (2017). Following DeVellis's approach helps researchers to develop conceptual models in identifying the key elements for the scale development by underlying the importance of a theoretical framework for obtaining robust measures. DeVellis (2017) presents an eight step model to guide the whole scale development stages as: determining clearly what it is you want to measure, generating an item pool, determining the format for measurement, developing an initial item pool reviewed by experts, considering inclusion of validation items, administer items to a development sample, and finally evaluating the items.

DeVellis (2017) suggests that in order to write relevant items, the researchers should be clear about what it is they want to measure. So, this research is based on the development

of a self-report scale about the professional language learning motivations of medical students. For this aim, DeVellis' approach was applied in generating an item pool. The initial items for the motivation scale were gathered from four sources, namely, a focus group interview with a sampling group of students, medical doctors as external experts, the related literature, and ESP researchers. To examine the content validity of the measure, we developed the initial form of the scale and calculated the content validity ratios for each item.

Determining the Target Motivational Concepts to be Measured

In order to determine the conceptual framework for motivational categories, we reviewed the existing literature and adopted some items from several standard scales and compared them with the previous data. These items related to instrumental and integrative motivation from Gardner & Lambert (1983). Also, intrinsic and extrinsic items were adopted from Noels, Pelletier, Clément and Vallerand (2000) and items related to L2 learning experience were adopted from Dörnyei (2005). After completing this stage, we hypothesized four categories, namely, instrumental, integrative, extrinsic, and intrinsic motivation.

Establishing the Item Pool

In this step, to specify the item pool, a focus group interview was organized with 7 randomly selected students among the target population (3 female, 4 male). The students were asked about their reasons and motivations for learning English. The interview lasted 25 minutes and was recorded for further analysis. For the validty, the content analysis was carried out separately by two researchers and the findings were compared. The blind analysis procedure revealed a 90% agreement between the raters. 22 items were compiled as a result of the first step.

Ensuring the Content and Face Validity

As suggested DeVellis (2017) to have the item pool reviewed by experts, the initial form was sent to 5 medical doctors with at least ten years of experience to make sure that the scale covered as many aspects as possible in terms of learning English as a doctor. The experts were asked to evaluate the clarity and conciseness of the items and decide whether they are relevant to the general purpose of the scale. Based on the suggestions of the practitioner doctors, content validity was calculated by utilizing the technique proposed by Davis (1992). Expert opinions were gathered by a scale form and the item content validity ratios were calculated accordingly. The experts were asked to evaluate the items presented in the form by marking options reading; "a-relevant", "b-needs minor revision", "c-needs some revision", and "d-not relevant". We also included an "opinion" column to obtain the experts' suggestions for any potential change. Following that, we calculated the Content Validity Ratio (CVR) for each item by using a technique suggested by Davis (1992) by dividing the sum of a+b into the total number of experts ($CVR=(a+b)/N_e$). According to Davis, an item is relevant for the scale if the calculated CVR value is larger than 0.80. According to Davis, the number of raters should be between 5 and 20. Table 3 shows expert opinions and calculated CVR values for each item on the initial form.

Table 3

Expert opinions and calculated Content Validity Ratios

	relevant	needs minor revision	needs some revision	not relevant	CVR	Interpretation
Item 1	5	0	0	0	1.00	Appropriate
Item 2	3	1	1	0	0.80	Appropriate
Item 3	4	0	1	0	0.80	Appropriate
Item 4	4	1	0	0	1.00	Appropriate
Item 5	0	1	2	2	0.20	Inappropriate
Item 6	5	0	0	0	1.00	Appropriate
Item 7	3	2	0	0	1.00	Appropriate
Item 8	4	0	1	0	0.80	Appropriate
Item 9	0	2	1	2	0.40	Inappropriate
Item 10	5	0	0	0	1.00	Appropriate
Item 11	0	1	1	3	0.20	Inappropriate
Item 12	5	0	0	0	1.00	Appropriate
Item 13	1	1	1	2	0.40	Inappropriate
Item 14	4	0	1	0	0.80	Appropriate
Item 15	5	0	0	0	1.00	Appropriate
Item 16	4	0	1	0	0.80	Appropriate
Item 17	0	1	2	2	0.20	Inappropriate
Item 18	3	2	0	0	1.00	Appropriate
Item 19	5	0	0	0	1.00	Appropriate
Item 20	1	1	2	1	0.40	Inappropriate
Item 21	4	0	1	0	0.80	Appropriate
Item 22	4	1	0	0	1.00	Appropriate

Expert panel (N=5)

Finally, as a result of the evaluation of the experts' opinions, the initial 22 item form was reduced to 16 items by the extracting 6 inappropriate items from the scale.

Following the retrieval of medical experts' opinions, the 22-item scale form was sent to three ESP experts for their opinions and suggestions about face validity including its scope, categorization, appropriateness, clarity, and layout. Feedback from the three experts revealed agreement for the integrative and intrinsic categories but they reported an overlap between the extrinsic and instrumental categories. Hence, the experts' feedback and related research showed that the instrumental motivation highly corresponded to external regulation (Dörnyei, 2005). Accordingly, we modified the scale by merging the extrinsic and instrumental categories, and named it the "extrinsic motivation" category.

As a result of the aforementioned process, we agreed on three categories and 16 items to represent the initial form of the scale. Being a self-report scale, the question form included two parts. The first part consisted of items regarding background information of

the participants, such as age and gender. In the second part of the scale, we used a Likert-type scale ranging from "strongly disagree" (1) to "strongly agree" (5). All the items started with the same statement, "I learn English…." (e.g., I learn English to be able to make presentations at international conferences.) The scale was in English and it took around 5 minutes to complete. In order to avoid possible comprehension problems, the scale was piloted with 70 participants from the same context (40 males and 30 females). No problem was observed as a result of the pilot study. The pilot data and the students were not used in the main study. The data both for the pilot and the main study were collected online via Google Forms in November 2021.

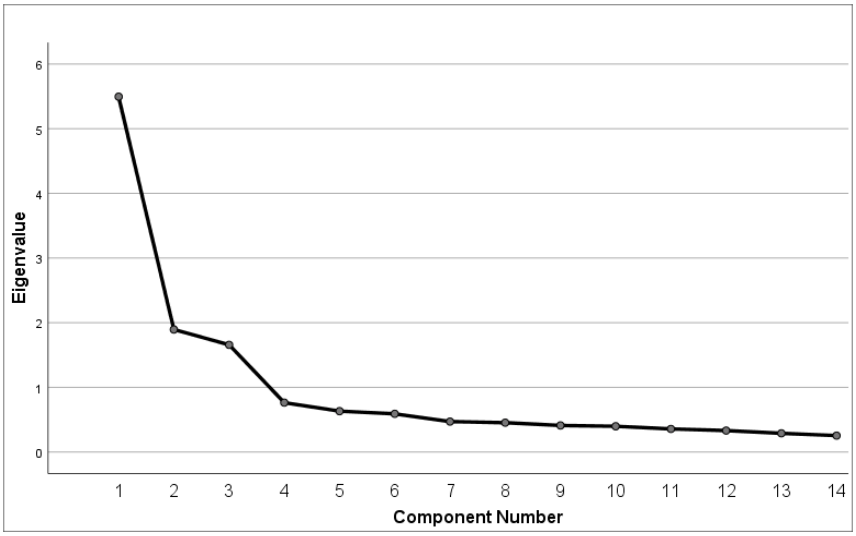
Data Analysis

This study aimed to develop a scale to determine the factors that motivate medical students learning English as a foreign language in an ESP context. A 16-item scale model was first tested by Explanatory Factor Analysis (EFA) for construct validity in order to reduce the data to a smaller set of variables that were closely associated to each other. LISREL (linear structural relations) was used for statistical analysis. Also, Confirmatory Factor Analysis (CFA) was performed to test the validity and accuracy of the structure obtained from the EFA by using IBM AMOS V25.

Findings

As for the EFA, we used Principal Component Analysis (PCA) to discover the factor structure of the Professional Language Learning Motivations Scale. For factor analysis, Direct Oblimin with Kaiser Normalization was used as a factor rotation method. As a statistical analysis method, EFA is used to identify the dimensionality of constructs by examining the relation between items and factors (Field, 2013). In order to evaluate the adequacy of the sample size, we calculated the Kaiser-Mayer-Olkin (KMO) coefficient as (KMO= 0.87>0.70) and considered the obtained value as adequate with reference to the literature, which considers a KMO coefficient value greater than 0.60 and closer to 1 as suitable for factor analysis (Tabachnick & Fidell, 2013). Additionally, in order to determine whether the correlations between the items on the scale were large enough to perform the EFA, we used Bartlett's Test of Sphericity and obtained sufficient values ($\chi 2(91)) = 2038.70$; $p<0.000$).

The results of the EFA revealed 3 factors with eigenvalues greater than 1 and were considered as significant (Büyüköztürk, 2005). The first factor with an eigenvalue of 4.22 explained 39.24% of the total variance and was named as "integrative motivation". The second factor with an eigenvalue of 3.91 explained 13.53% of the total variance and was named as "intrinsic motivation". The third factor with an eigenvalue 3.61 explained 11.84% of the total variance and was named as "extrinsic motivation". The total variance explained by the three factors was calculated as 64.62% of the total variance. The scree plot is presented in Graph 1.



Graph 1

Scree plot for the number of components in the principal components analysis

Additionally, communalities were calculated to explore the factor loadings for each item and only two items were removed, since they had communality values below 0.40, specified as the minimum criteria suggested by Field (2013). The items "I learn English to specialize in medicine." and "I learn English to pursue an academic career." did not load above 0.40 on any factor and were extracted accordingly. Given these overall findings, factor analysis was determined as suitable for 14 items in total. Results of the EFA are presented in Table 4.

Table 4

Factor loadings for rotated exploratory factor analysis

	All the items start with "I am learning English…"	**Extraction**	**1**	**2**	**3**
1.	in order to follow innovations in the field of	0.654	.823		
2.	so that I can read scientific publications in English.	0.741	.802		
3.	to improve myself in my profession.	0.588	.792		
4.	to write academic articles.	0.602	.735		
5.	to earn more money.	0.562	.718		
6.	so I can get more respect in my profession.	0.665		-.832	
7.	in order to become a more successful doctor.	0.689		-.802	
8.	to become a more cultured doctor.	0.564		-.785	
9.	to become a better doctor.	0.666		-.782	
10.	to become a more knowledgeable doctor.	0.575		-.615	
11.	so that I can work abroad.	0.727			.883
12.	to be able to communicate with my foreign	0.729			.843

13. to be able to communicate with my foreign patients.	0.666			.776
14. to be able to present at international conferences.	0.621			.752
	Eigenvalues	4.228	3.911	3.616
	% of variance explained	39.249	13.533	11.843
	KMO	0.873		
	Bartlett's Test of Sphericity (Approx. Chi-Square)	2038.70	P	.000

As a reliability measure in scale development, the item-total correlation was also calculated. Statistically significant correlation values were obtained in the same direction between all item total values for the dimensions. The item-total correlations matrix is given in Table 5.

Tablo 5.
Item-total correlations matrix

	Intrinsic motivation	Integrative motivation	Extrinsic motivation
Intrinsic motivation	1.000		
Integrative motivation	0.332**	1.000	
Extrinsic motivation	0.410**	0.450**	1.000

** Correlation is significant at the 0.01 level (2-tailed).

As the second step of the factor analysis, Confirmatory Factor Analysis (CFA) was performed for accuracy and internal validation purposes to confirm whether the indices of fit of the three-factor structure were acceptable. IBM AMOS V25 was used for CFA. Table 6 presents the fit indices for the CFA model.

Table 6

Fit indices for the CFA model

Fit indices	χ^2/fd	RMSEA	SRMR	TLI	NFI	CFI	IFI	GFI
Calculated value	1.961	0.055	0.046	0.956	0.931	0.965	0.965	0.941
Criteria	≤ 3*	≤ 0.08**	≤ 0.05*	≥ 0.95*	0.90**	≥ 0.95*	≥ 0.95*	≥ 0.90**

**Good fit. **Acceptable.*

As given in Table 6, GFI (0.941) and RMSEA (0.055) indicate a reasonable fit (<0.08), while the other fit indices indicate a good model fit (<0.05).

In order to obtain fit indices for the convergent validity, the items with factor loadings lower than 0.70 and those with a VIF value higher than 3 should be removed from the analysis (Hair et al., 2006). Items with factor loadings lower than 0.70 were specified. As those items with factor loadings lower than 0.70 were removed from the scale, the AVE value did not significantly increase and was calculated to be higher than the critical value of 0.50. For that reason, items with factor loadings lower than 0.70 were not removed from the scale.

Additionally, VIF (Variance Inflation Factor) values were used to decide whether multicollinearity existed between the variables. As a result of the analysis, the VIF value was found to be lower than 3 and multicollinearity was not found between the variables. Also, AVE values were found to be higher than the critical value of 0.50. The internal

reliability of the factors was calculated by Cronbach Alpha and Composite Reliability statistics. The internal reliability values for both statistical processes were found to be higher than the critical value of 0.70 (Cortina, 1993; Blunch, 2008).

To find out the discriminant validity (Fornell-Larcker criterion), the square root of the AVE for each of the variables was calculated as greater than the critical value of 0.70, as evidence for the discriminant validity of the factors.

We also carried out descriptive statistics to determine the means and standard deviations for the three factors. The highest mean value was calculated for integrative motivation (4.190±0.872), whereas the lowest mean value was calculated for intrinsic motivation (3.321±0.969). The results are presented in Table 7.

Table 7
Internal-consistency and discriminant validity for professional language learning motivation.

	Cronbach Alpha	Composite Reliability	AVE	Discriminant Validity	Mean ± Std.Dev
Integrative motivation	0.840	0.844	0.576	0.759	4.190 ± 0.872
Extrinsic motivation	0.843	0.844	0.523	0.723	3.975 ± 0.914
Intrinsic motivation	0.844	0.846	0.525	0.724	3.321 ± 0.969

The model, including the three factors detected in EFC, was confirmed by AMOS software and is presented in Figure 2 as the standard solution model. According to the path diagram, all the paths are statistically significant. Also, the error terms between the items, namely, Ext4 and Ext5 were modified.

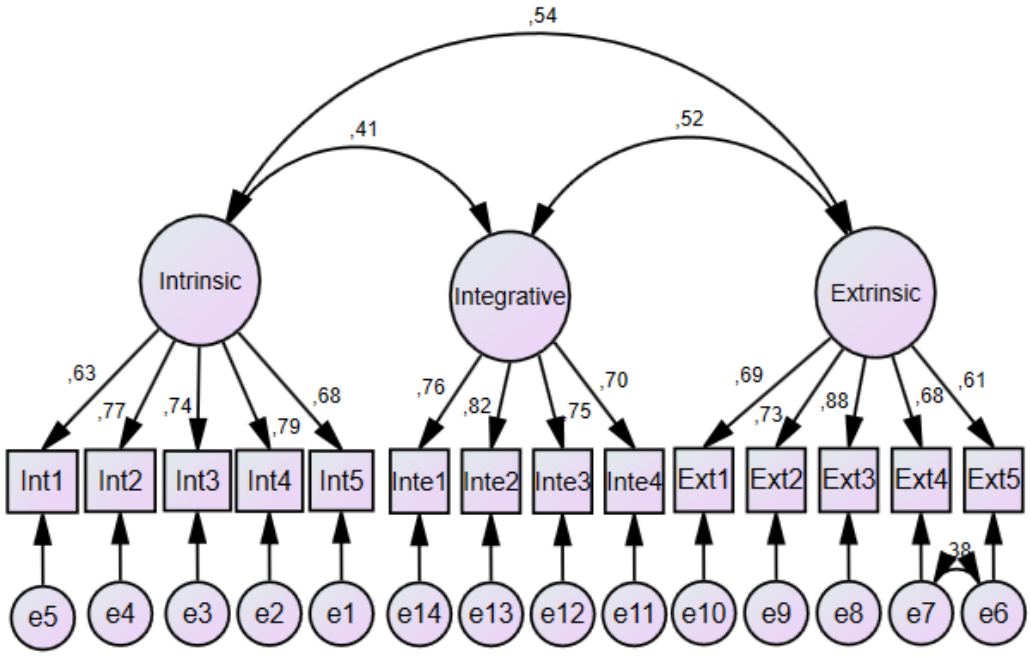


Figure 2
Path diagram for confirmatory factor analysis of professional language learning scale

As another criterion to assess discriminant validity, we also calculated the Fornell-Larcker criterion by using the square root of each construct AVE, whose values are supposed to be higher than their corresponding correlations with any other construct (Fornell and Larcker, 1981). We also calculated the heterotrait-monotrait ratio (HTMT) as more evidence of the discriminant validity between the factors of the scale. The results suggest that the motivational factors of the scale have discriminant validity. Table 8 presents the results.

Table 8

Discriminant validity index summary

Fornell-Larcker	Integrative	Extrinsic	Intrinsic
Integrative	0.759		
Extrinsic	0.515	0.723	
Intrinsic	0.410	0.535	0.724
HTMT			
Integrative			
Extrinsic	0.505		
Intrinsic	0.416	0.538	

Reliability

To ensure the reliability of the motivation scale, internal consistency reliability coefficient and Tukey's Test for Non-additivity were calculated. The scale was considered as a whole and the internal consistency reliability coefficient Cronbach Alpha statistic was calculated as 0.878. The results of Tukey's Test for Non-Additivity showed that the scale was non-additive (F=6.412, p=0.011). Table 9 presents the calculated values.

Table 9

Results for Reliability Coefficients and Non-Additivity

Factors	Number of Items	Cronbach Alpha	Composite Reliability	Tukey's Test for Non-additivity	
				Friedman's Chi-Square	P
Integrative motivation	4	0.840	0.844	8,629	0,003
Extrinsic motivation	5	0.843	0.844	0,004	0,947
Intrinsic motivation	5	0.844	0.846	0,121	0,728
Scale	14	0.878	0,941	6,414	0,011

According to Table 9, the reliability coefficients can be categorized as good (Field, 2009). Additionally, the results of the Tukey's Test for Non-additivity revealed additivity for the factors "Intrinsic motivation (F=0.121, p=0.728)" and "Extrinsic motivation (F=0.004, p=0.947)" whereas the Integrative motivation (F=8.629, p=0.003) and the overall scale (F=6.414, p=0.011) was found to be not additive.

The Evaluation of the Scores

The final form of the Professional Language Learning Motivation Scale (PLLMS) consists of 14 items under three main categories namely; intrinsic motivation (5 items), extrinsic (instrumental) motivation (5 items), and integrative motivation (4 items). A 5-point Likert type scale ranging from "1= strongly disagree" to "5= strongly agree", should be used as the response format. The evaluation of the scores is based on the sum of item scores obtained from each factor. The scores obtained from each dimension of the scale can be listed as follows: "Intrinsic motivation" and"Extrinsic motivation" factors can range between 5 and 25, and "Integrative motivation" factor can range between 4 and 20. Due to the non-additivity of the scale, a total score cannot be used for statistical procedures. The higher score obtained from any dimension shows that it is influential for learning motivation. Also, there are no reverse items in the scale. All the items are positively worded.

Discussion and Conclusion

This study was conducted to develop a scale which was developed to measure the professional foreign language learning motivations of medical students. Although the language learning motivation of EFL learners is usually assessed by a number of common scales developed by various researchers (Clément et al., 1994; Noels et al., 2000; Dörnyei & Csizér, 2002; Dörnyei, Csizér & Németh, 2006; Dörnyei, 2005; Dörnyei, 2010; Gardner & Lambert, 1972), this study puts more emphasis on the importance of exploring FL learning motives through a professional perspective.

To develop a motivation scale, both exploratory and confirmatory factor analyses were performed to confirm the construct validity of the scale. As a result of the EFA, a three factor structure instrument for evaluating professional foreign language learning motives was found to explain 64.62% of the total variance. After deleting two items with low communality values, the final form of the scale had 14 items under three main categories, intrinsic motivation (5 items), extrinsic (instrumental) motivation (5 items), and integrative motivation (4 items). Thus, the PLLMS was confirmed with its three-factor structure. The findings also suggested that the sample size was appropriate to test the validity of the scale (N=320).

The internal reliability of the scale was calculated by Cronbach Alpha coefficient. Internal consistency for the three factors was found as 0.84 for the integrative, extrinsic, and intrinsic dimensions. These values suggest that PLLMS can be utilized as a valid and reliable tool to identify the foreign language learning motivations of medical students. Also, the scale is practical as it can be implemented with its 14-item structure.

While several studies have verified foreign language learning motivation scales, the Professional Language Learning Motivation Scale (PLLMS) can be used by researchers in tertiary education to be able to find out the professional motives for medical students learning English as a foreign language. Further research should investigate the relationship between the professional language learning factors and other

variables such as learner attitudes, learner beliefs and other factors that might be correlated.

Limitations and Implications

This study has a number of limitations and implications for further studies. In particular, despite the evidence for the reliability and validity of the PLLMS presented by this study, further evidence is needed to test the validity of the scale in other contexts. As a new tool for measuring motivation, PLLMS should be applied to a larger number of participants for more confirmation. Further research is also needed to clarify the theoretical model proposed by this study. In this study we proposed a model including intrinsic, extrinsic and integrative motivation. However, new research might draw different conclusions about the categorization of the items and might reveal different models of motivation.

Author contribution

The contribution of the first and the second authors to the study is 50% for each.

Conflict of interest

The authors of this study declare that there is no conflict of interest.

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