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Developing Academic Motivation Scale for Learning Information Technology (AMSLIT): A Study of Validity and Reliability

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Abstract

This study aimed to develop Academic Motivation Scale for Learning Information Technology for university students. For this purpose, 120 randomly selected university students studying in different classes and faculties at KSU were invited to the study during the 2016-2017 academic year. To define the scale indicators students were asked to answer the question; “What are your motivations for learning information technologies?”. Four different academicians examined the answers in accordance with the self-determination theory and they created the item pool. After expert examinations and pilot studies, the scale was designed in Likert-type with 18 items in 6 categories. To analyze the construct validity of the scale, 824 randomly selected students among the freshmen at KSU were included in the sample of the research. Among those, 276 of the students were included in the exploratory factor analysis in the first step, 269 were involved to repeat the first step with a new sample, and 279 participated in the last step to carry out the confirmatory factor analysis. Although literature suggest three different types of motivation (extrinsic, intrinsic, and amotivation), in this study, it was found that the intrinsic and extrinsic motivation items were gathered together and expressed as a single factor named “Intrinsic-Occupational Motivation”. According to the results, the final state of the scale included 15 items in two sub-dimensions. The sub-dimensions were named as “Intrinsic-Occupational Motivation” and “Amotivation”. It is understood from the analysis that the results derived from the scale have high reliability.

Keywords: information technology education, self-determination theory, academic motivation, scale development, factor analysis

1. Introduction

Information technologies refer to the technological elements in the management and use of “knowledge” that has gained much more importance in the recent years (Turunc, 2006). In other words, "information technology" is a concept, which expresses transmission and processing of the acquired information as well as the storage and usage of it (Robson, 1990). Thanks to the Information Technologies, almost every field has undergone a serious restructuring, which has directly affected many areas, including education (Barutcugil, 2002).

Although the use of computers in education started in 1980 in Turkey (Matargem, 1991), thanks to the projects run by the Ministry of National Education since 1987, elective “computer” course has taken its place in the curriculum. The ministry, which has made serious project breakthroughs in the past years, has now been actively involved in computer training at all levels. “Computer” training at the university level, on the other hand, has continued until today under the leadership of Data Processing Centers (BIM) (Ak, 2009) established in 1980. The course, which entered the university curriculum under the name of “Computer”, is now named “Basic Information Technologies” as a compulsory course in the first year. The main objective of this course is “to know the advantages and disadvantages of the use of technology in everyday life while acquiring basic computer literacy skills. In the framework of individual and independent learning, the course also aims at providing students with an effective learning environment where they reach remote information.” In the light of this information, it might be claimed that the teaching of information technology is a critical issue that should be emphasized in the field of education (Seferoglu & Akbıyık, 2005). Another topic that needs to be addressed in education is student motivation.

Motivation is the most important factor that affects learning process and success (Yılmaz & Cavas, 2007). Briefly, motivation can be described as the power that stimulates a person to act in order to do something (Martin, 2001; Ryan & Deci, 2000). According to Pintrich & Schunk (1996), motivation is inherent to the

learning process rather than the input and output of it, and it is a pushing factor that influences learning behaviour of the student (Brophy, 1987). Deci & Ryan (1980) examined the sources of motivation for individuals considering their psychological needs. They have put forward the well-known "self-determination theory" in order to understand the motivation of individuals (Deci & Ryan, 1980). In this theory, there is a distinction between motivation types. The main reason for such a kind of distinction is that individuals have different reasons and objectives to move into action (Ryan & Deci, 2000). Those reasons and objectives have been referred as intrinsic motivation, extrinsic motivation and amotivation.

Intrinsic motivation is the willingness of a person to demonstrate an activity without an external reward (Deci, 1975). Individuals with internal motivation have their own desire-anticipation and they are able to see the end of their work (Akpınar et al., 2013). In education, these characteristics are critical since they reinforce concepts such as creativity (Ryan & Deci, 2000).

Extrinsic motivation depends on the external factors (punishment, reward etc.) (Dede & Argün, 2004) and it can easily be observed since it depends on an external source (Kazusu, 1999). Unlike intrinsic motivation, extrinsic motivation may be viewed as an inadequate form of motivation, and students may be engaging in their activities as a result of different negative motives (e.g., punishment) rather than because they are intrinsically motivated (Ryan & Deci, 2000). Another difference between these two types of motivation is the effect of individual control in intrinsic motivation, and environmental factors in extrinsic motivation (Yazıcı, 2009). Additionally, it is necessary to see that intrinsic motivation is based on the individual factors, and the extrinsic motivation is based on the organization level. As it can be distinguished in motivational theories, in particular, intrinsic motivation is the case when a person is not motivated by a prize other than the work that s/he is doing. Extrinsic motivation on the other side appears with the presence of activities driven by external awards (status, appreciation or promotion etc.) (Deci, 1971).

The difference between the intrinsic and extrinsic motivation is similar to the difference between work content and context. Factors such as achievement and responsibility are the motivational factors most associated with the work itself, and the performance the actor, etc. Factors such as payment and promotion etc. are related to the context or the environment of the work. Therefore, intrinsic motivators are internal rewards that one feels when performing a task. For this reasons, in intrinsic motivation, there is a direct and rapid relationship between the work and the prize. It means that a person in this situation is self-motivated to accomplish the task. Extrinsic motivators, on the other side, are external rewards that are out of the nature of the work. They are not direct satisfactory factors when performing the task (Newstrom & Davis, 2002). On the other side, amotivation can be described as a reluctance to move/get an action, which occurs with occasional negative experiences (Deci & Ryan, 1985). It might lead to serious distress in education, especially in the sense of academic achievement.

When the relevant literature about the motivation of the students towards academic issues is analyzed it is understood that "academic motivation" has been commonly used to refer motivation for academic activities. In academic motivation-based studies, it has been found that motivation leads to a positive influence on the academic achievement of the individuals (Fortier, Vallerand, & Guay, 1993; Singh, Granville, & Dika, 2002; Wentzel & Wigfield, 1998). In addition to this, for measuring academic motivation quantitatively, "scales" examining various motivation styles have been developed. For instance, Vallerand (1992) developed a different version of the "Academic Motivation Scale" within the framework of the self-determination theory mentioned above.

When other scales for academic motivation are examined, it is seen that Gottfried (1986) has developed the "Intrinsic Academic Motivation Scale", evaluating the internal dimension of motivation; Pelletier et al. (1995) have suggested "Sports Motivation Scale" within the framework of self-determination theory; Bozanoğlu (2004) has put forward "Academic Motivation Scale", and Tuan, Chin, & Shieh (2005) have developed the "Motivation Scale for Science Learning". In another study, Aydın, Yerdelen, Yalmanc, & Göksu (2014) have offered "Academic Motivation Scale for Learning Biology". They have developed the scale for high school students, and 472 participants in Kars city centre consisted of the population of the study. They have developed the scale with a four-factor structure. These are named as Intrinsic Motivation, Amotivation, Extrinsic Motivation-Occupation, and Extrinsic Motivation-Social.

Moving from the aforementioned studies, a literature review has not revealed any academic scale that measures the motivation of students for learning information technologies. In addition, it is revealed that the scales developed in other disciplines emphasize motivation processes mostly (Aydın et al., 2014). In this respect, this study aims at developing an "Academic Motivation Scale for Information Technology Learning (BÖYAM)" for university students in accordance with the self-determination theory. In line with this purpose, as the first scale

development work in the field of information technology-motivation, this study is thought to be of great importance in terms of providing fundamental information to those who develop university education programs related to information technology. As well as bridging the gap in the relevant literature, it will also shed light on the scale development studies related to academic achievement and motivation for other disciplines at the tertiary level.

2. Method

2.1 Item Writing

In order to construct items, a randomly selected 120 university students studying at different faculties and classes at KSU in the 2016-2017 academic year were asked to respond to the question "What is your motivation for learning information technology?". 60 minutes were allocated to the volunteered students to answer the question, and their answers were examined in accordance with the self-determination theory (Amotivation/Intrinsic motivation / Extrinsic motivation) as specified by Deci & Ryan (1985, 1991). (What we mean by examination here is that student responses were analyzed according to the content analysis principles of qualitative research. It was aimed to reveal the motivating factors of students regarding their learning of information technologies.) According to this theory, "motivation" is the reason for behaviour. In other words, if an individual has a motivation to learn a subject, we can express it on the scale as "for ....." (Vallerand et al., 1992). For this reason, after a detailed examination of the data collected from 120 university students, three different academicians in the field of educational sciences constructed a questionnaire pool consisting of 21 questions. Since it is practical to analyze the data and easy for students to answer, the questions were redesigned in 6-pointLikert-type questionnaire between the choices of (1) strongly disagree- (6) strongly agree (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2014). After the analysis of the questionnaire by a Turkish language expert, one item was eliminated, and the scale was designed with 20 items. 80 university students were selected randomly for pilot study. The 20-item scale was administered to those 80 students. During the practice, a suitable environment in which students would feel comfortable was provided, and students participated voluntarily. After all students completed the scale, each question was discussed one by one in the classroom. Volunteered students reported their views on what the items might mean, and the experts evaluated these opinions. Scale items were discussed in a mutual interaction environment. Two items with the same meaning and/or meaning ambiguity were eliminated from the scale. Thus, the scale had 18 items in its final form before the further analysis.

2.2 Participants

The study group was randomly selected among university students taking Information Technology courses. Accordingly, students studying at their 1st year at KSU was designated as the population of the study. Afterwards, among the population, a total of 824 students, 276 of whom for the first stage, 269 for the second stage, and 279 for the third stage were randomly selected. Participated students are those who took information technology or a related course during their secondary and high school education, and those who have been attending the Information Technology course at the university level.

2.3 Data Analysis

In this study, the Hybrid approach was followed (Matsunaga, 2010). According to this approach, Principal Component Analysis (PCA) should be applied first in order to reduce the number of the items. In the second step, with a different sample, an exploratory factor analysis (EFA) is performed to confirm the factor structure of the PCA in the first round. Finally, a confirmatory factor analysis (CFA) is applied to a new sample in order to support the factor structure (Aydın et al., 2014). Although this method is used in scale construction studies, some researchers indicate that the PCA "does not carry the qualities of the factor analysis" (Costello & Osborne, 2005; Field, 2005). Thus, when looking for evidence in the second sample to confirm the validity of the results from the first data set, it is more appropriate to use exploratory factor analysis rather than principal component analysis at the first stage (Aydın et al., 2014). For all these reasons, the data were collected from 545 people in the first part (first and second stage) of the study. The data were randomly divided into two, and both groups were subjected to exploratory factor analysis, then the similarity of the results for the structures was examined. In the final part of the study, more data were collected from another group of 279 people, and the validity of the structures emerged in the first part was tested.

3. Findings

3.1 Exploratory Factor Analysis (First Step)

The data collected from the 276 participants in the first data set for developing The Academic Motivation Scale for Learning Information Technology (AMSLIT) were analyzed through SPSS 20 statistical analysis software for EFA. The results are given below.

In order to reveal initials factors, 18 items in the first version of the scale were analyzed with Principal Axis Factoring. Principal Axis Factoring was preferred since it is more appropriate for the purpose of the research (Matsunaga, 2010; Warner, 2012). Principal Axis Factoring is also the most commonly used method in social sciences (Warner, 2012). Field (2005) and Thompson (2004) suggest the use of oblique axis rotation methods for the analysis of interrelated factor structures. For this reason, assuming that the items on the scale were related to each other, it was concluded that the Promax (kappa=4) axis rotation method was appropriate for this research.

According to the results of the initial analysis, there was no item loaded on two different factors, thus no item was removed from the scale. Later, another item ("Not to be considered as backward/illiterate") was found to have factor loading lower than 0.30, thus it was removed from the scale.

Factor analysis was carried out again with 17 items as the new form of the scale. According to the analysis result, the value of Kaiser-Meyer-Olkin (KMO) was found as 0.843 which was higher than the recommended cut-off value of 0.60 (Field, 2005; Pallant, 2001). Those results prove that the data structure was appropriate to carry out factor analysis. Barlett's sphericity test showed that chi-square value ($\chi 2$= 1325) was statistically significant ($p < .001$). All these results revealed that the correlation matrix was appropriate; in other words, the variables performed a sufficient relationship to carry out factor analysis (Field, 2005). Consequently, findings of the exploratory factor analysis were evaluated in the next stage.

Considering the rule that Keiser value is higher than 1, and it is consistent with the scree plot, it was seen that the scale consisted of two factors. These factors explained 24.80% and 10.17% of the total variance, respectively. In other words, the two-factor structure rotated according to the Promax method explained 34.98% of the total variance. The first of these two factors was named "Intrinsic-Occupational Motivation" and the second one is called "Amotivation". According to this result, the loadings of all items on these two factors are given in Table 1 (numbers between the parenthesis represent factor structure matrix).

As a result, when the above-mentioned item ("Not to be considered as backward/illiterate") was excluded from the analysis and the remaining 17 items were reanalyzed, the item distribution was as follows: 9 items for Intrinsic-Occupational Motivation factor and 8 items for Amotivation factor. The factor loadings of these items ranged from .704 to .514, and .675 to .392, respectively, while factor correlations ranged between .703 and .448; .636, and .460, respectively.

Table 1. Factor loadings of 2-factor AMSLIT items rotated by promax method

Items		Factor	
		Intrinsic- Occupational Motivation	Amotivation
2	Because I think it will be useful to me for my profession in the future.	.704(.703)	
5	Because I am interested in the topics related to information technology.	.658(.676)	
15	Because I think it will contribute to my education.	.644(.626)	
4	Because it is prerequisite for business life.	.559(.611)	
1	Because it is the necessity of our age.	.559(.598)	
10	Because it makes our everyday life easier.	.557(.559)	
8	Because I want to improve myself in the field of information technology.	.556(.547)	
16	Because it is related to the profession I will do in the future.	.533(.541)	
7	To be able to fulfil citizenship duties with systems such as Bimer / e-government.	.514(.448)	
11	I keep away from it since it has a negative effect on social life.		.675(.636)
9	I do not want to learn information technology because it hurts my personality.		.630(.633)
6	I am not interested in information technology since it leads to addiction.		.619(.617)
13	I am against information technology because it isolates people.		.588(.556)
12	I do not think it is beneficial to me.		.578(.546)
14	I cannot find any reason to learn information technology.		.500(.522)
3	I find information technologies unnecessary.		.489(.508)
17	Honestly, I do not know why I learn Information technology.		.392(.460)

Internal consistency coefficient for the above two factors was examined. For intrinsic-occupational motivation factor, Cronbach Alpha was found to be .826 (9 items), and for amotivationfactor, it was .780 (8 items). Hence, it can be claimed that the results of the data set were reliable.

3.2 Exploratory Factor Analysis (Repetition of the Analysis in a Different Sample—Second Step)

The data collected from the 269 individuals in the second data set were analyzed through SPSS 20 statistical analysis software for exploratory factor analysis. As a result, 17 items were fixed in 2 factors and the factor analysis was repeated.

Similar to the first step, in the second step Principle Axis Factoring method with Promax (kappa = 4) axis rotation was used. Kaiser-Meyer-Olkin (KMO) value was found as 0.60 (Field, 2005; Pallant, 2001). Thus, it was decided that the data set were appropriate for factor analysis. The Bartlett sphericity test showed that chi-square value ($\chi 2 = 1300$) was statistically significant ($p < .001$). All these results revealed that the correlation matrix was appropriate, and the variables performed a sufficient relationship to carry out factor analysis (Field, 2005). Thus, the results of the explanatory factor analysis with the second data set were sufficient for evaluation.

By repeating the exploratory factor analysis, the first two-factor structure was supported for 17 items. The variance explained by the two factors from the second dataset was 24.76% and 10.41% respectively. These values are very close to the first dataset. According to this result, factor loadings of each item on are presented in Table 2 (additionally, the numbers in parentheses represents factor structure matrix).

Table 2. Factor loadings of 2-factor AMSLIT rotated by promax method according to the repeated exploratory factor analysis

Items		Factor	
		Intrinsic-Occupational Motivation	Amotivation
2	Because I think it will be useful to me for my profession in the future.	.699(.628)	
5	Because I am interested in the topics related to information technology.	.656(.610)	
15	Because I think it will contribute to my education.	.643(.624)	
4	Because it is prerequisite for business life.	.579(.574)	
8	Because I want to improve myself in the field of information technology.	.570(.564)	
10	Because it makes our everyday life easier.	.557(.596)	
1	Because it is the necessity of our age.	.557(.673)	
16	Because it is related to the profession I will do in the future.	.529(.544)	
7	To be able to fulfil citizenship duties with systems such as Bimer / e-government.	.511(.447)	
11	I keep away from it since it has a negative effect on social life.		.674(.633)
6	I am not interested in information technology since it leads to addiction.		.628(.520)
9	I do not want to learn information technology because it hurts my personality.		.626(.616)
13	I am against information technology because it isolates people.		.599(.570)
12	I do not think it is beneficial to me.		.575(.630)
14	I cannot find any reason to learn information technology.		.496(.514)
3	I find information technologies unnecessary.		.485(.542)
17	Honestly, I do not know why I learn Information technology.		.383(.452)

According to Table 2, the factor loadings of the items were between .699 and .511; .674 and .383, respectively, whereas the factor correlation showed similar results with the first data set changing between .628 and .447; .633 and .452 respectively. This indicated that each item explained sufficient variance in its factors. Additionally, the Cronbach Alpha scores were found to be .828 for Intrinsic-Occupational Motivation (9 items), and .780 for the Amotivation factor (8 items) respectively. Thus, it can be said that the results were also reliable for the second data set. In other words, it was seen that the results of the first and the second stages were parallel to each other, and 17 items in two factorial structures were supported in the second stage.

3.3 Confirmatory Factor Analysis (Last Step)

The factor structure emerged in the first data set was also supported in the second data set, and it provided reliable results. Thus, it was decided to carry out a confirmatory factor analysis in order to finalize the AMSLIT scale. Therefore, the 17-item AMSLIT scale was applied on a new sample for the last time.

As in the first and second data sets, a different student group was randomly selected for the third data set, and the scale was applied to a total of 279 individuals.

Firstly, the data were examined in terms of the premises, and then the univariate normality, the multivariate normality and extreme values were checked. Skewness and Kurtosis values proved that the data did not violate the "univariate normality assumption" (Skewness = 190, Kurtosis= 148). Then, in the third data set, the data of five individuals that had a tendency to distort the multivariate normality were removed from the analysis (the number of samples decreased from 284 to 279). Confirmatory factor analysis was then performed with AMOS 25 software.

Two items of the 17-item scale were omitted from the analysis since their factor loadings were lower than the cut-off point of 0.5 (Hair, Black, Babin, Anderson, & Tatham, 2010). Those were the items of "I am not interested in information technology since it leads to addiction" and "To be able to fulfil citizenship duties with systems such as Bimer / e-government". Confirmatory factor analysis of the remaining 15 items showed that the fit indices were consistent with the model data set ($\chi2(279) = 225.07$, $p< .05$; $\chi2/sd = 2.61$; CFI = 0.88; GFI = 0.90; NFI = 0.82; RMSEA = 0.76; 90% CI = 0.064, 0.089). In the table below, the loadings of the items are given according to the standardized parameter (λ) estimate.

Table 3. Standardized parameter estimates (λ) for the two-factor AMSLIT

Items		Factor	Λ
1	Because it is the necessity of our age.	IOM	.601*
2	Because I think it will be useful to me for my profession in the future.	IOM	.617*
4	Because it is prerequisite for business life.	IOM	.532*
5	Because I am interested in the topics related to information technology.	IOM	.539*
8	Because I want to improve myself in the field of information technology.	IOM	.526*
10	Because it makes our everyday life easier.	IOM	.654*
15	Because I think it will contribute to my education.	IOM	.676*
16	Because it is related to the profession I will do in the future.	IOM	.511*
3	I find information technologies unnecessary.	Amot	.571*
9	I do not want to learn information technology because it hurts my personality.	Amot	.534*
11	I keep away from it since it has a negative effect on social life.	Amot	.654*
12	I do not think it is beneficial to me.	Amot	.693*
13	I am against information technology because it isolates people.	Amot	.561*
14	I cannot find any reason to learn information technology.	Amot	.521*
17	Honestly, I do not know why I learn Information technology.	Amot	.548*

Note. * *p<.01.* (IOM: intrinsic-occupational motivation, Amot: Amotivation).

Factor correlation (Phi values) was significant at $p <.01$ and a negative correlation was found between these two factors. In addition, the 2 factorial structure of the AMSLIT was supported by confirmatory factor analysis, and then the internal consistency coefficients of the factors were analyzed. Cronbach's Alpha value for the Intrinsic-Occupational Motivation factor was found to be .816; while it was .785 for the Amotivation factor. Based on those results, it can be said that the obtained data from AMSLIT were reliable. Finally, the mean score, standard deviation and reliability coefficients for the sub-dimensions of AMSLIT were found to be 4.61, 1.46 and .816 for intrinsic-occupational motivation and they were 2.89, 1.64 and .758 for the Amotivation.

4. Discussion

In this research that aims to develop Academic Motivation Scale for Learning Information Technologies, an item pool was established by considering the self-determination theory of Deci & Ryan (1985; 1991). One item was eliminated from the pool according to the results of the analysis, and it was seen that the scale consisted of 17 items in two sub-dimensions. In other words, items of intrinsic motivation and occupational motivation, which were considered as two separate factors, regrouped and formed a single factor. In the second stage, this 17-item scale was applied to a different sample and the results were analyzed with descriptive factor analysis. The same factor structure was obtained statistically (2 factors, 17 items).Thus, the dimensions of the scale were named as Intrinsic-Occupational Motivation and Amotivation. Although Deci & Ryan (1985; 1991) suggest three different types of motivation (extrinsic, intrinsic, and amotivation), in this study, it was found that the intrinsic and extrinsic motivation items were gathered together and expressed as a single factor named "Intrinsic-Occupational Motivation".

Considering the fact that university students in our country are going to the universities in order to acquire a profession, it is quite natural that such a sub-factor related to "occupational motivation" appears in the scale. Similar to the study carried out by Glynn, Taasoobshirazi, and Brickman in 2009, it was seen that the scale

formed a different sub-dimension related to the career in scale development process. Likewise, in a study for the development of Academic Motivation Scale for Learning Biology, Aydın et al. (2014) found that one of the sub-dimensions of the scale was structured as "Extrinsic Motivation—Occupation", they also concluded that in such a case "considering the conditions in Turkey and the age factor of the participating individuals, separation of occupation-related items as a different sub-dimension for motivation is logical".

The factor structure of the Academic Motivation Scale for Learning Information Technologies was supported in the last step by confirmatory factor analysis. This proves the construct validity of the first two phases. Cronbach's Alpha values for reliability were determined as .816 for the Intrinsic-Occupational Motivation factor, and .785 for the A motivation factor. These values prove that the data was valid and reliable.

Thinking that information technologies are in all areas of life today, it might be suggested that studies on information technology education, especially those in the field of motivation, should be encouraged. Because, thanks to the individuals with high academic motivation, Turkey's academic achievements in the IT sector will grow and the class activities that apply information technologies will be more fruitful.

References

Ak, B. (2009). Türkiye'de sağlık bilişimi, bir kişisel değerlendirme ve uluslararası bir başarı öyküsü: CorTTex. 11. Akademik Bilişim Konferansı, Sözlü Sunum, Şanlıurfa, Türkiye.

Aydın, S., Yerdelen, S., Yalmancı, S. G., & Göksu, V. (2014). Academic Motivation Scale for Learning Biology: A Scale Development Study. *Education and Science, 36*(176), 425-435. http://dx.doi.org/10.15390/EB.2014.3678

Barutcugil, İ. (2002). *Bilgi yonetimi.* İstanbul: Kariyer Yayıncılık.

Bozanoğlu, İ. (2004). Academic motivation scale: development, reliability, validity. *Ankara University, Journal of Faculty of Educational Sciences, 37*(2), 83-98. https://doi.org/10.1501/Egifak_0000000094

Brophy, J. (1998). *Motivating students to learn*. Madison, WI: McGraw Hill.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & ve Demirel, F. (2014). *Bilimsel araştırma yöntemleri*. Ankara: Pegem Yayınları.

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation, 10*(7), 1-9.

Deci, E. L. (1971). Effects of Externally Mediated Rewards on Intrinsic Motivation. *Journal of Personality and Social Psycology, 18*(1), 105-115. https://doi.org/10.1037/h0030644

Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum. https://doi.org/10.1007/978-1-4613-4446-9

Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. *Advances in Experimental Social Psychology, 13*(1), 39-80. https://doi.org/10.1016/S0065-2601(08)60130-6

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press. https://doi.org/10.1007/978-1-4899-2271-7

Deci, E. L., & Ryan, R. M. (1991). *A motivation approach to self: Integration in personality*. In R. Dienstbier (Ed.). Lincoln, NE: University of Nebraska Press.

Deci, E. L., & ve Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268. https://doi.org/10.1207/S15327965PLI1104_01

Dede, Y., & Argün, Z. (2004). Identification of Students' Intrinsic and Extrinsic Motivation Towards Mathematics. *Education and Science, 29*(134), 49-54.

Field, A. (2005). *Discovering statistics using SPSS* (2nd ed.). London: Sage Publications. https://doi.org/10.1006/ceps.1995.1017

Fortier, M. S., Vallerand, R. J., & Guay, F. (1995). Academic motivation and school performance: Toward a structural model. *Contemporary Educational Psychology, 20*, 257-274. https://doi.org/10.1006/ceps.1995.1017

Glynn, S. M., Taasoobshirazi, G., & Brickman, P. (2009). Science motivation questionnaire: Construct validation with nonscience majors. *Journal of Research in Science Teaching, 46*, 127-146. https://doi.org/10.1002/tea.20267

Gottfried, A. E. (1986). *Children's Academic Intrinsic Motivation Inventory* (CAIMI). Odessa, FL: Psychological Assessment Resources.

Hair, J. F., Black, B., Babin, B., Anderson, R. E., & Tatham, R. L. (2010). *Multivariate Data Analysis* (7th ed.). Upper Saddle River, NJ: Prentice-Hall.

Kazusu, K. (1999). *Oral self-expression activities as a facilitator of students' positive attitudes and motivation.* Retrieved from www.surrey.ac.itk/ELI/kttdok.pdf

Martin, A. J. (2001). The student motivationscale: A tool for measuring and enhancing motivation. *Australian Journal of Guidance and Counselling, 11*, 11-20. https://doi.org/10.1017/S1037291100004301

Matsunaga, M. (2010). How to factor-analyze your data right: Do's, don'ts, and how-to's. *International Journal of Psychological Research, 3*(1), 97-110. https://doi.org/10.21500/20112084.854

Metargem, (1991). *Milli Egitim Bakanlığı Özel İhtisas Komisyonu Raporu*. Yayınlanmamış Araştırma Raporu, Ankara.

Newstrom, J. W., & Davis, K. (2002). *Organizational Behaviour (human behaviour at work)* (11th ed.). Mc-Graw-Hill, Minnesota.

Pallant, J. (2001). *SPSS survival manual: A step by step guide to data analysis using SPSS*. Philadelphia, PA: Open University Press.

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., Tuson, K. M., BriEre, N. M., & Blais, M. R. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The sport motivation scale (SMS). *Journal of Sport and Exercise Psychology, 17*, 5-53. https://doi.org/10.1123/jsep.17.1.35

Pintrich, P. R., & Schunk, D. H. (1996). *Motivation in education: Theory, research and application* (2nd ed.). Englewood Cliffs, NJ: Merrill Company.

Robson, W. (1990). *Strategic Management ve Information Systems* (2nd ed.). Londra: Pitman Publishing.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54-67. https://doi.org/10.1006/ceps.1999.1020

Seferoğlu, S., & Akbıyık, C. (2005). A study on primary school teachers' perceived computer self-efficacy. *Eurasian Journal of Educational Research, 19*, 89-101.

Singh, K., Granville, M., & Dika, S. (2002). Mathematics and science achievement: effects of motivation, ınterest, and academic engagement. *The Journal of Educational Research, 95*(6), 323-332. https://doi.org/10.1080/00220670209596607

Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington, DC: American Psychological Association. https://doi.org/10.1037/10694-000

Tuan, H. L., Chin, C. C., & ve Shieh, S. H. (2005). The development of a questionnaire to measure students' motivation towards science learning. *International Journal of Science Education, 27*(6), 639-654. https://doi.org/10.1080/0950069042000323737

Turunç, Ö. (2006). Bilgi Teknolojileri Kullanımının İşletmelerin Örgütsel Performansına Etkisi: Hizmet Sektöründe Bir Araştırma, Yayımlanmamış (Doktora Tezi. Süleyman Demirel Üniversitesi, Sosyal Bilimler Enstitüsü, Isparta, Türkiye). Retrieved from https://tez.yok.gov.tr/UlusalTezMerkezi/

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Brière, N. M., Senécal, C., & Vallières, E. F. (1992). The academic motivation scale: a measure of intrinsic, extrinsic, and amotivation in education. *Educational and Psychological Measurement, 52*, 1003-1017. https://doi.org/10.1177/0013164492052004025

Warner, R. M. (2012). *Applied statistics: from bivariate through multivariate techniques: from bivariate through multivariate techniques*. London, UK: Sage.

Wentzel, K. R., & Wigfield, A. (1998). Academic and social motivational influences on students' academic performance. *Educational Psychology Review, 10*(2), 155-175. https://doi.org/10.1023/A:1022137619834

Yazıcı, H. (2009). Teaching profession sources of motivation and basic attitudes: a theoretical overview. *Kastamonu Education Journal, 1*(17), 33-46.

Yılmaz, H., & Çavaş, P. H. (2007). Reliability and validity study of the students' motivation toward science learning (SMTSL) questionnaire. *Elementary Education Online, 6*(3), 430-440.

Appendix A

Academic Motivation Scale for Learning Information Technology (AMSLIT) (in English)

Dear participant, There are 35 items in this scale which are prepared to examine the reasons for learning information technologies. Read each question carefully and mark the most appropriate option from 1 to 6. Please do not leave an unmarked statement. Do not write your name on this paper, do not put any expression that will identify your identity. Thank you for your participation.	- Strongly Disagree	- Disagree	- Partly Disagree	+ Partly Agree	+ Agree	+ Strongly Agree
1. Because it is the necessity of our age.	(1)	(2)	(3)	(4)	(5)	(6)
2. Because I think it will be useful to me for my profession in the future.	(1)	(2)	(3)	(4)	(5)	(6)
3. I find information technologies unnecessary.	(1)	(2)	(3)	(4)	(5)	(6)
4. Because it is prerequisite for business life.	(1)	(2)	(3)	(4)	(5)	(6)
5. Because I am interested in the topics related to information technology.	(1)	(2)	(3)	(4)	(5)	(6)
6. Because I want to improve myself in the field of information technology.	(1)	(2)	(3)	(4)	(5)	(6)
7. I do not want to learn information technology because it hurts my personality.	(1)	(2)	(3)	(4)	(5)	(6)
8. Because it makes our everyday life easier.	(1)	(2)	(3)	(4)	(5)	(6)
9. I keep away from it since it has a negative effect on social life.	(1)	(2)	(3)	(4)	(5)	(6)
10. I do not think it is beneficial to me.	(1)	(2)	(3)	(4)	(5)	(6)
11. I am against information technology because it isolates people.	(1)	(2)	(3)	(4)	(5)	(6)
12. I cannot find any reason to learn information technology.	(1)	(2)	(3)	(4)	(5)	(6)
13. Because I think it will contribute to my education.	(1)	(2)	(3)	(4)	(5)	(6)
14. Because it is related to the profession I will do in the future.	(1)	(2)	(3)	(4)	(5)	(6)
15. Honestly, I do not know why I learn Information technology.	(1)	(2)	(3)	(4)	(5)	(6)

Appendix B

Academic Motivation Scale for Learning Information Technology (AMSLIT) (in Turkish - BOYAM)

Değerli katılımcı, Bilişim teknolojilerini öğrenme sebeplerinizi inceleyebilmek amacıyla hazırlanan bu ölçekte toplam 35 madde bulunmaktadır. Her bir soruyu dikkatlice okuyarak size en uygun gelen seçeneği 1'den 6'ya kadar işaretleyiniz. Lütfen işaretsiz ifade bırakmayınız. Bu kâğıt üzerine adınızı yazmayınız, kimliğinizi belirtecek herhangi bir ifade koymayınız. Katılımınızdan dolayı teşekkür ederiz.	- Kesinlikle katılmıyorum	- Katılmıyorum	- Kısmen Katılmıyorum	+ Kısmen katılıyorum	+ Katılıyorum	+ Kesinlikle Katılıyorum
1. İçinde bulunduğumuz çağın gerekliliği olduğu için	(1)	(2)	(3)	(4)	(5)	(6)
2. İleride yapacağım meslekte bana faydası olacağını düşündüğüm için	(1)	(2)	(3)	(4)	(5)	(6)
3. Bilişim teknolojilerini gereksiz buluyorum	(1)	(2)	(3)	(4)	(5)	(6)
4. İş hayatının olmazsa olmazı olduğu için	(1)	(2)	(3)	(4)	(5)	(6)
5. Bilişim teknolojileri ile ilgili konular ilgimi çektiği için	(1)	(2)	(3)	(4)	(5)	(6)
6. Bilişim teknolojileri alanında kendimi geliştirmek istediğim için	(1)	(2)	(3)	(4)	(5)	(6)
7. Kişiliğime zarar verdiği için bilişim teknolojilerini öğrenmek istemiyorum	(1)	(2)	(3)	(4)	(5)	(6)
8. Gündelik yaşamımı kolaylaştırdığı için	(1)	(2)	(3)	(4)	(5)	(6)
9. Sosyal hayata olumsuz etkisi olduğu için uzak duruyorum	(1)	(2)	(3)	(4)	(5)	(6)
10. Bana bir faydasının olacağını düşünmüyorum	(1)	(2)	(3)	(4)	(5)	(6)
11. İnsanları yalnızlaştırdığı için bilişim teknolojilerine karşıyım	(1)	(2)	(3)	(4)	(5)	(6)
12. Bilişim teknolojileri öğrenmek için herhangi bir sebep bulamıyorum	(1)	(2)	(3)	(4)	(5)	(6)
13. Eğitim hayatımda bana katkısı olacağını düşündüğüm için	(1)	(2)	(3)	(4)	(5)	(6)
14. Gelecekte yapacağım meslek ile ilişkili olduğu için	(1)	(2)	(3)	(4)	(5)	(6)
15. Açıkçası ne için bilişim teknolojilerini öğrendiğimi bilmiyorum	(1)	(2)	(3)	(4)	(5)	(6)