

## **Development and validation of an e-teachers' autonomy-support scale: A SEM approach**

Akram NAYERNIA, Iran University of Science and Technology, Iran

Studies have shown that learner autonomy plays a decisive role in online learning, but teachers' autonomy supportiveness is still under-researched. This issue has particularly remained untouched in online instruction which has gained importance recently. Considering the lack of an appropriate context-specific scale for the investigation of online teachers' autonomy support, the current study sought to develop and validate a scale for this purpose. It investigated the factors that contribute to autonomy support by Iranian EFL teachers in online contexts. The literature on the topics of autonomy and e-learning was reviewed extensively, and a questionnaire was developed and validated through Structural Equation Modeling (SEM) methodology. The thematic analysis of the literature and experts' opinions finally yielded 48 factors that were grouped in seven categories comprising negotiation, awareness, freedom, teacher attitude, scaffolding, authenticity, and technical help.

**Keywords:** Autonomy; Autonomy Support; Scale Validation; Structural Equation Modeling

### **1. Introduction**

Autonomy is considered as an educational goal which is applicable in different settings (Dickinson, 1994; Little, 1999; Littlewood, 1996). The first definition for autonomy was proposed by Holec (1981) who defined autonomy as the ability that enables learners to take responsibility for their own learning. As Little (1991) stated, autonomy is a capacity for independent action, detachment, decision-making, and critical thinking. Discussing the processes of autonomy development, Benson (2001) pointed at the importance of three levels of possible control: (a) control over the cognitive process, (b) control over learning management, and (c) control over learning content. By the same token, Aoki (2000) argued that autonomy development is a process that "needs a teacher for a variety of reasons" (p. 151).

With regard to the growing interest in developing students' autonomy to prepare them for lifelong learning (e.g., Evans & Boucher, 2015; Dickinson, 1994; Littlewood, 1996; Little, 1999; Reinders & White, 2016), few studies have been conducted to examine e-learning teachers' role in this respect.

Farivar and Rahimi (2015), for instance, have asserted that most Iranian students at different levels of education are dependent upon teachers in the classroom, and there are few opportunities for students to control their own learning. Rarely do the students get the information themselves as, most of the time, it is the teacher who provides all the information the students need to access. Likewise, Ahmadi and Mahdavi-Zafarghandi (2013) stated that Iranian students are not autonomous; they believe that the burden of managing and planning aspects of students' learning is on their teachers' shoulders. A question is therefore raised here: When students are not autonomous enough in the classroom, how are they going to be successful in e-learning context in which they mostly do not have access to their teachers? This suggests that there is a strong need for students to accept responsibility for their own learning. It is also important to help students to become aware of the value of independent learning outside the classroom so that they acquire the habit of learning continuously and maintain it after they have completed their formal studies.

In this respect, the present study seeks to investigate the extent to which Iranian EFL teachers, particularly those involved in e-learning systems, promote autonomy among e-learners. More specifically, it intends to probe the factors that are related to the promotion of autonomy among Iranian teachers in 'e-learning' EFL contexts. Nevertheless, to the best of the researcher's knowledge, no questionnaire has yet been designed to evaluate online instructors' performance with respect to autonomy supportiveness. The present study, therefore, aims to develop and validate such an Autonomy Support Scale for EFL teachers in e-learning systems in Iran.

## **2. Background**

Autonomous learning has gained more attention in the last two decades. Little (1991) considered it as the "buzz-word" of the 1990s in the second language learning field, and it has been the focus of many studies since then (e.g., Arnold, 2006; Assor, Kaplan & Roth, 2002; Benson, 2011; Cheon, Reeve, Yu & Jang, 2014; Collins, 2008; Najeeb, 2013; Wright, 2005). It is claimed that autonomous learning engages learners in a process in which learners make decisions on their own based on their language competence through which "they are likely to be more enthusiastic about learning" (Littlejohn, 1985, p. 258). As Risenberg and Zimmerman (1992) stated, high degrees of autonomy cause learners to achieve higher scores; accordingly, learners with low degrees of autonomy gain lower scores.

According to Ahmadi and Mahdavi-Zafarghandi (2013), despite the fact that Iranian students are ready to accept the responsibility of some aspects of their learning, they still depend on their teachers to manage all activities in

class and to choose objectives and materials. They also indicated that Iranian students considered themselves as learners who could manage their own learning. However, they claimed that they never practiced most of the autonomous activities.

In order to shed more light on the importance of teachers' role in encouraging the practicing of autonomy, Kiany, Mahdavy and Ghafar Samar (2013) concluded, in a study on Iranian learners' motivational changes in a traditional context, that "context is more in favor of extrinsic motivational forces rather than intrinsic types" (p. 12). The reasons may be rooted in the fact that students are not aware of the significance of autonomy in their learning process because teachers do not practice it in their classroom. The researchers also indicated that it is hard to develop learner autonomy in this kind of context (Kiany, Mahdavy & Ghafar Samar, 2013). However, fostering autonomous language learning is undependable if teachers aim to help students to become creative and lifelong learners (Ahmadi & Mahdavi-Zafarghandi, 2013). In addition, Farivar and Rahimi (2015) stated that most students at different levels of education are dependent on teachers in the classrooms, and there is no opportunity for students to control their own learning. Students also claimed that they do not often get the information themselves due to the fact that their teachers were the provider of the information (Farivar & Rahimi, 2015).

Since Information and Communication Technologies (ICTs) widen access to a universal scope and facilitate learning throughout life, ICT plays a significant role in learning and teaching, and it has been widely recognized as a priority in academic development (Cantoni, Cellario & Porta, 2004). According to statistics, an ever increasing number of students are attending different levels of virtual courses in Iran, and universities are planning to expand their capacities to accommodate 10,000 students per year (Darab & Montazer, 2011). In this respect, there is a need in Iranian context which would contribute to a better learning environment.

E-learning is defined as an innovative approach to facilitating a well-designed, media-equipped, interactive and learner-friendly education for anybody, anywhere and at any time (Peters, 2001). It applies various digital sources along with other educational methods, provided through open, flexible and well-distributed educational systems. Due to the nature of e-learning, in which students do not have access to their teachers, students need to take their learning responsibility and learn on their own. As Peters (2001) suggested, distance education, as a distinct form of education, both requires and promotes autonomy. However, as it was mentioned above, Iranian students are not capable of using this source, and it consequently affects their learning.

Since lack of face-to-face interaction is an issue in online learning contexts (Hartley & Bendixen, 2001), autonomy support and psychological development play a significant role in such contexts. On the one hand, autonomy support has been claimed by scholars to contribute to learners' engagement in learning activities (Assor, Kaplan & Roth, 2002; Cheon, Reeve, Yu & Jang, 2014; Deci, Schwartz, Sheinman & Ryan, 1981; de Fátima Goulão & Menedez, 2015); psychological development, on the other hand, directs them to manage and organize what to learn (Little, 1991). To support this argument, Jones (2001) suggested that autonomy is required in online learning—due to the lack of teacher-student interaction—in order to enable learners to take responsibility on their own. In this vein, scholars (Arnold, 2006; Bol & Garner, 2011; Murray, 2011; Peters, 2001) considered autonomy as a critical factor in a successful online course.

Notwithstanding the important contribution of autonomy in learning and increasing the nature of online learning as a paradigm of modern education, few studies, if any, have addressed the extent to which teachers are autonomy-supportive in e-learning EFL context. Moreover, to the best of the researcher's knowledge, there is no questionnaire which could contribute to examining teachers' autonomy-supportive role in online classes. With regard to the growing interest in developing teacher education and to fill these gaps in the literature, this study seeks to investigate factors that contribute to EFL teachers' attitude and role in developing learner autonomy in online learning. To this end, the main focus of the study is to implement the Structural Equation Modeling (SEM) approach to develop and validate a context-specific questionnaire of autonomy support by Iranian EFL teachers in e-learning contexts.

### **3. Method**

#### **3.1. Participants**

This study was launched with 70 participants. Three different groups of participants took part in this study. Ten experts, highly professional, and key figures of TEFL who were university professors at state universities in Iran participated in this study. They are all native speakers of Persian and teach university courses in English. An attempt was made to select the experts who had the experience of teaching online courses. They were asked to voluntarily take part in a phase of the study. They were also asked to read the factors which were extracted from the related literature and to choose the ones which are necessary for promoting autonomous learning among EFL learners in an e-learning context. Then, they were asked to add their own opinion and other factors based on their experience.

The second group of participants comprised 60 online instructors who were asked to fill in the questionnaire and the newly developed questionnaire was piloted and validated with them using machine presented measures, that is, the adequacy measures supported by the software used, the *AMOS* (Version 18).

Sample size in SEM methodology has been a challenging issue for the past few decades. Some studies have been conducted with sample sizes as large as thousands along with published research reports of investigated samples as small as a few hundred (Bentler & Yuan, 1999). The minimum sample size to deploy the SEM methodology requires up to fifteen subjects per parameter to be estimated. The sample size in the studies published in language testing, either using a priori item banks or collecting field data, vary from study to study (Byrne, 2010).

### **3.2. Instruments**

The major instruments used in this study were (1) a list of factors in promoting autonomy in an e-learning context extracted from the related literature and (2) an autonomy-support questionnaire that was developed by the researcher based on the factors that had been confirmed by experts in the field. The development and validation of the questionnaire was part of the study. Furthermore, the newly developed questionnaire was administered to 60 instructors and a student version of the questionnaire was given to 60 e-learners; the aim was to assess Iranian online teachers' performance with respect to autonomy supportiveness. Also, an interview with experienced online instructors was conducted to investigate e-learning issues.

### **3.3. Procedure**

To accomplish the purpose of the study, after an extensive literature review, 74 items which could contribute to promoting autonomy in e-learning English classes were extracted through thematic analysis. After extracting the factors, they were subjected to analysis by experts in the field. After obtaining experts' views, the frequency of each item rated by the experts was calculated and 50 items agreed upon by the experts ranked as 'highly effective' and 'very effective' were selected. These were evolved into a scenario-based, 5-point Likert-scale questionnaire. There were two versions of the questionnaire, one for the instructors and the other for the learners.

After obtaining the experts' views, the newly developed questionnaire was piloted and validated using SEM methodology. It was administered to 60 instructors to make it ready for the final use. The data exploration phase yielded a rather normally distributed data set which was qualified for the development of SEM measurement and structural models for further

investigation of fitness in accordance with the adopted methodology (Byrne, 2010).

In order to extract the factors that might contribute to autonomy supportiveness in ELT context, the literature of online learning and autonomy was reviewed extensively and 74 factors were extracted from the literature. Additionally, as a conceptual means of validating the items and probing more deeply into the experts' view about this study, the items were subjected to experts' opinion. The experts were asked to select the items which were defined in detail with the references that may contribute to fostering autonomy in an e-learning context. The items selected by six out of ten reviewers as "strongly agree" and "agree" were considered as contributors to e-learners' autonomy. Following this phase, 19 low-ranked items were eliminated) and the rest of the factors were merged and rephrased to become shorter. Care was taken to avoid jargons that may cast doubt on its validity. After that, the proto-questionnaire was presented to three university professors to verify its format. Finally, a 5 point Likert scales e-learning context-specific autonomy support instrument was developed.

Following this step, a confirmatory factor analysis was run to check the construct validity of the newly developed autonomy support questionnaire with respect to its item distribution and structure. In order to validate the newly developed questionnaire, 60 university professors from different universities were asked to fill it in. Therefore, the questionnaire was pilot tested using 60 instructors; because the number of participants was rather low for factor analysis techniques, a confirmatory factor analysis was utilized to calculate the factor loading of individual items into their respective categories (negotiation, awareness, freedom and independence, scaffolding, teacher attitude and activities, authenticity and relevance, and technical help and guidance).

#### **4. Results**

Since, it was necessary to confirm whether the postulated model was qualified with respect to the included measurement models before finalizing it, each component was tested in a separate measurement model—that is, the categories in the questionnaire: negotiation, awareness, freedom, scaffolding, teacher attitude, authenticity, and technical help. Later, the models were combined to compose a general first-order model of which the stability was tested through the regression weights and their loading factors into their components (see Figure 1 below). Figure 1 represents the related factor structure model—as a measurement model—to assess the possibility of claiming the psychological reality of the constructed structure as measured in the newly developed questionnaire as well as the regression weights of items into their respective factors.

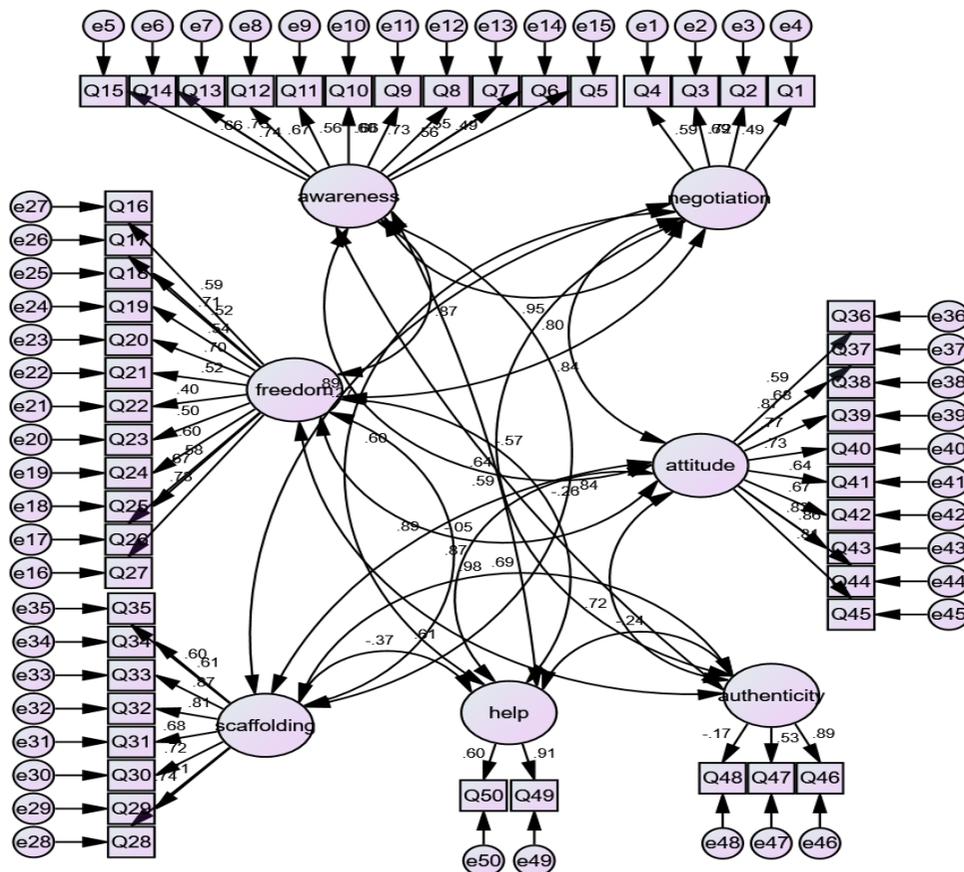


Figure 1. Hypothesized relationships among the categories of questionnaire of the first model

The developed factor model consisted of seven regression weights to be estimated. The regression weights represent the load of factor levels as they are measured by the questionnaire. The autonomy support questionnaire consisted of seven categories: negotiation (4 items), awareness (11 items), freedom (12 items), scaffolding (8 items), teacher attitude (10 items), authenticity (3 items), and technical help (2 items). According to the values in the figure, the model consisted of acceptable fit indices except for two of the questions (i.e., items 22 and 48). The regression weights for items 22 and 48 are lower than 0.4 which is not acceptable. Therefore, they were discarded in order to have a sound standardized model. Model fit indices for the first model are presented in Table 1.

Three models were tested in this phase of research: (a) the independence model, (b) the saturated model, and (c) the default model. The primary model

is the *default* model in which the data were modified to reach a satisfactory model. The saturated model is the model where the number of estimated parameters equals the number of data points (i.e., variances and covariance of observed variables, as in the case of the just-identified model); it is the least restricted. The independence model (i.e., in which all correlations among variables are zero) is the most restricted. In other words, it is a null model (Byrne, 2010).

Table 1  
*Model Fit Indices for the First Model*

	Models		
	Default	Saturated	Independence
NPAR	171	1325	100
CMIN	11667.004	0.000	16740.715
DF	1154	0.000	1225
P	0.000		0.000
CMIN/DF	2.11		13.666
NFI	0.93	1.000	0.000
RFI	0.860	0.000	
IFI	0.92	1.000	0.000
TLI	0.881	0.000	
CFI	0.922	1.000	0.000
RMSEA	0.09		0.000

In Table 1, the values of NPAR (number of parameters), CMIN (minimum discrepancy), DF (degrees of freedom), P (probability value), and CMIN/DF all represent an acceptable amount of value. In the next group of the statistics, NFI (normed fit index), RFI (relative fit index), IFI (incremental fit index), TLI (Tucker-Lewis index), CFI (comparative fit index) and RMSEA (the root mean square error of approximation) which are referred to as incremental or comparative indices of fit (Byrne, 2010) are also represented. As Byrne (2010) pointed out, these indices range from 0 to 1; for a model to be acceptable, they must be close to 1. As it is evident in the table, all indices of this group are 0.8 and above, referring to the best model fit with the data.

To check the validity of the newly developed questionnaire, the first-order model was revised and two questions were eliminated to arrive at the best fitting model which confirmed the validity of the postulated model. The second model with the discarded items presents the acceptable regression weights higher than 0.4 and all fit indices presented in Tables 2 indicate a good model fit with the data. Therefore, it can be concluded that Figure 2 is a justified model representing the values in Table 2 which, in turn, confirms the internal consistency claim of the questionnaire.

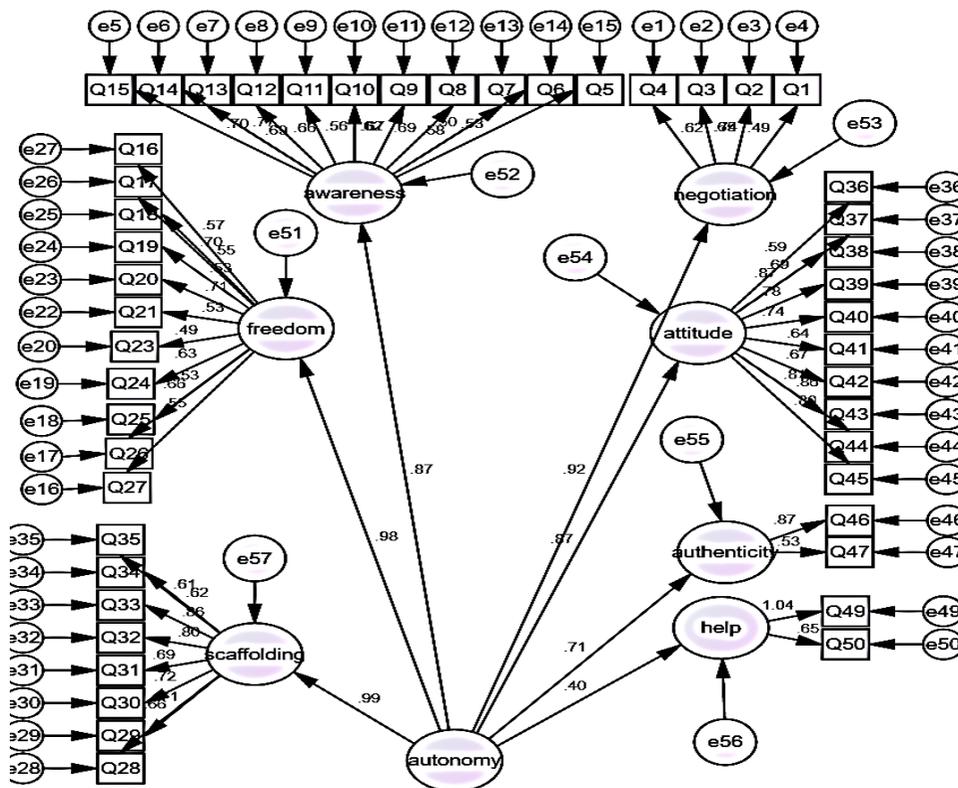


Figure 1. Hypothesized Relationships among the Categories of Questionnaire of the Second Model

Table 2  
Model Fit Indices for the First Model

	Models		
	Default	Saturated	Independence
NPAR	145	1224	96
CMIN	10798.118	0.000	15458.101
DF	1079	0.000	1128
P	0.000		0.000
CMIN/DF	2.008		13.704
NFI	0.901	1.000	0.000
RFI	870	0.000	
IFI	0.924	1.000	0.000
TLI	0.891	0.000	
CFI	0.922	1.000	0.000
RMSEA	0.08		0.247

Following the validation phase of the newly developed questionnaire, the reliability of the questionnaire had to be ensured as well. The questionnaire was classified into seven themes, and there were 50 five-level Likert items addressing the main practices that an instructor could work on to improve autonomous learning in an online learning environment (negotiation, awareness, freedom and independence, scaffolding, attitude, authenticity, and technical help). As it was mentioned above, the pilot questionnaire was completed by 60 online instructors and following a confirmatory analysis of the data described earlier, two of the items were eliminated due to their unacceptable regression weights. As such, the reliability of the questionnaire without considering the two discarded items (i.e., items 22 and 48) turned out to be 0.911 which shows a satisfactory level of conceptual relatedness among items (cf., Bryman & Cramer, 2005; Field, 2009). Moreover, since the newly developed questionnaire consisted of seven scenarios, Cronbach's *alpha* was estimated for each category. The value of Cronbach's *alpha* for awareness, freedom and independence, scaffolding, teacher attitude are larger than .7 which is an acceptable value. However, the alpha coefficients for negotiation (0.287) and authenticity (0.472) were rather low which can be justified by the low number of items in these two categories (4 and 2 items, respectively); the number of items in each category can be increased in further studies.

## 5. Discussion

The objective of the present study was to extract factors contributing to online teachers' autonomy support. Attempt was made to investigate the fitness of the final model to the collected data and to develop an autonomy support questionnaire. There were parameters of interest in the model to be estimated through fitting the measurement models, the structural model which was tested for indices of model fitness upon the development of minimal model fitting measures. The methodology used was adopted and was developed from frequent SEM methodologies in the field of educational measures. The modifications were also introduced.

The questionnaires' components were extracted from the relevant literature and the importance of some practices in online learning which could contribute to fostering autonomy among learners was highlighted. The factors (74 items) were submitted to experienced university professors in the online context, and they were asked to review and select those items which can encourage autonomy among e-learners. A comprehensive model was triggered to confirm the validity of the questionnaire, and the measurement models were used to weight the loads of the intended factors into their associated factor/construct. The use of SEM methodology in the current research is supposed to account for and evaluate the merits of such research as the methodology applied shall include almost all of the variables of

interest. Furthermore, the model can be tested at any level to capacitate the researcher to elaborate on the contribution of factors to the measurement model. Nevertheless, the methodology was deployed in a number of sequential steps. For the first step, the primary data source was investigated with regard to any possible statistical data distortion. The explored data were used to compose the final dataset which was used for the modeling procedures: the measurement models and the structural model. However, the first step in conducting any SEM methodology is developing a first order measurement model (Byrne, 2010). This model could be used to provide justifications on the validity of the construct. The measure by itself is composed of different categories, and for each category of the questionnaire, a particular measurement model was developed and tested. The model was later tested to account for the load of the items into their associated constructs. At this stage, for each separate construct, a first-order factor was defined and was recognized through testing the measurement models. The regression loads of the indicators into their associated construct were used to elaborate on the qualification of the model. However, the model was tested and compared against the standard measures in accordance with the recommended methodology.

For the second and the final step, the measurement models were used to compose a comprehensive model representing the higher-order model of the construct. The two items with low regression weights were eliminated and the construct of the questionnaire was tested at its higher order. The fitness indices were found satisfactory.

The factor loading for scaffolding in the current study is 0.991 which is a high value. That means Iranian online instructors believe that scaffolding the learners plays a crucial role in developing autonomy among them in virtual classes. The finding is consistent with Snodin's (2013) study in which he suggested that, in order to increase learners' engagement and promote autonomous learning, teachers should scaffold students' activities in a careful way. Furthermore, Arnold (2006) highlighted the role of scaffolding and guidance in online classes in his research. He asserted that by giving feedback and encouraging the learners to develop their ideas, online instructors can foster autonomy in this context. The importance of autonomy is also mentioned in Luzon' (2006) study which suggests that scaffolding is a constructivist notion in an e-learning context which can develop autonomous learning.

Freedom which is highlighted in a number of studies as a factor that plays a significant role in promoting autonomy among learners yielded a high factor loading (0.983) in this study as well. The result supports Benson and Lor's (1988) finding. He proposed freedom as one of the requirements for

improving autonomous learning. Moreover, he went on by emphasizing the role of freedom in the development of autonomy. He suggested autonomy as an internal capacity which can be fostered by practicing freedom in a learning process (See also Benson & Huang, 2008).

As the factor loading for negotiation shows (0.923), this study is in line with study of Arnold (2006). According to Arnold (2006), negotiation is an essential part of promoting autonomy in which students will learn how to personalize tasks and renegotiate them. He also suggested an electronic Independent Learning Plan (ILP) to accomplish this goal. Negotiation is also highlighted in Erturk (2016). Although he did not limit the interaction just between teacher and learners, he suggested in his study that negotiation can develop autonomous learning by improving decision-making and learning skills, and it can be done through interaction and a cooperative atmosphere among learners as well.

Awareness, Attitude, and Authenticity also indicated high factor loadings (0.874, 0.873, and 0.713, respectively). The result of the present study mirrors that of Chang, Fukuda, Durham and Little (2017) study in which they highlighted the importance of autonomy-supportive classroom. They engaged the Self-Determination Theory to introduce five practices in which teachers can promote autonomous learning among students: (1) acknowledgement of learners' feelings (item 5 in awareness), (2) removal of controlling event (item 16 in freedom), (3) giving clear instruction (item 3 in negotiation), and (4 and 5) providing positive feedback and structural guidance (items 28 and 32 in scaffolding). It is also consistent with Ivanova (2017), Büyükduman and Şirin (2010), and Porto's (2007) findings that suggested that instructors should support autonomous learning by encouraging students to keep portfolios and diaries as a way of being aware of their own strengths and weaknesses. By the same token, Arnold (2006) and Haftner and Miller (2011) emphasized the role of teachers in providing an opportunity for learners to reflect on the learning process in an autonomy-supportive class (item 8 in awareness). The finding of this study lends support to Lee (2016) with respect to awareness; Lee found that teachers' encouragement to engage in learning materials and tasks cognitively promotes autonomy among learners.

The high loading factor for teachers' activities and attitude supports Scharle and Szabo's (2000) finding. They pointed out in their studies that if teachers want to foster autonomy among learners, they should have a well-designed lesson plan for their class and emphasized having routines in the class that can contribute to cognitive development and consequently autonomous learning in the class; this is consistent with the results of the present study as well (item 44). Although engaging in an e-forum is highlighted in some studies as an autonomy supportive practice (Erturk, 2016; Parker, Maor & Herrington,

2013), the current study did not support it; item 49 which contained this practice indicated the lowest loading factor (0.488).

## 6. Conclusion

Since the benefits of online learning have been supported by a number of studies (e.g., Kern, 1995; Lee, 2002; Magnan, Farrell, Jan, Lee, Tsai, & Worth, 2003), the numbers of online learners who are enrolling in virtual learning are increasing significantly. As Hagel and Shaw (2006) proposed, in online education, students are off the campus, and they need to be more responsible for their learning and make decision on their own. Therefore, considering the fact that online technologies in an educational context are associated with autonomous learning (Frizler, 1995; Khoosf & Khosravani, 2014; Najeeb, 2013; Schmenk, 2005; Yagcioglu, 2015) and play a crucial role in this context (Drennan, Kennedy & Pisarski, 2005; Luzón, 2006), the present research was carried out to investigate the factors that contribute to autonomy support by teachers in on-line context.

The results of this study can be used as a documented evidence for the validity of the developed questionnaire. However, the questionnaire's validation suffered from an insufficient number of participants in the piloting phase, and an inadequate number of items for two of the sections. Therefore, the developer recommends that the study be replicated with a large number of participants and an added number of items in the 'authenticity' and 'technical help' sections of the questionnaire.

It is believed that the replication of the present study or enlarging its scope in order to collect more valid evidence for an argument of validity for the newly developed questionnaire can be done. Replication of the present study is possible with a large number of participants including both e-learners and instructors; with more participants engaged in a replication of this study, more reliable and accurate results may be gained. It is also suggested that the data sources be triangulated to ensure the validity and reliability of the data based on which interpretations are made firm conclusions are reached. Last but not least, the participants of the present study were selected from state universities; to gain stronger evidence for autonomy supportiveness of online instructors, future researchers may want to replicate this study in other educational contexts.

### The Author

Akram Nayernia (Email: [nayernia@iust.ac.ir](mailto:nayernia@iust.ac.ir)) is Assistant Professor of Applied Linguistics/TESOL at Iran University of Science and Technology, Iran. Her main areas of interest include language assessment, teacher education, and materials development.

## References

- Ahmadi, R., & Mahdavi-Zafarghandi, A. (2013). Autonomous language learning in Iranian context: To what extent do students take responsibility for their learning. *International Journal of Research Studies in Language Learning*, 2(5), 17-26.
- Aoki, N. (2000). Affect and the role of teacher in the development of learner autonomy. In J. Arnold (Ed.), *Affect in language learning* (pp.142-154). Cambridge: Cambridge University Press.
- Arnold, L. (2006). Understanding and promoting autonomy in UK online higher education. *International Journal of Instructional Technology & Distance Learning*, 3(7), 33-46.
- Assor, A., Kaplan, H., & Roth, G. (2002). Choice is good, but relevance is excellent: Autonomy-enhancing and suppressing teacher behaviors predicting students' engagement in schoolwork. *British Journal of Educational Psychology*, 72(2), 261-278.
- Benson, E. J. (2001). The neglected early history of codeswitching research in the United States. *Language & Communication*, 21(1), 23-36.
- Benson, P. (2011). What's new in autonomy. *The Language Teacher*, 35(4), 15-18.
- Benson, P., & Huang, J. (2008). Autonomy in the transition from foreign language learning to foreign language teaching. *DELTA: Documentação de Estudos em Lingüística Teórica e Aplicada*, 24, 421-439.
- Benson, P., & Lor, W. (1998). *Making sense of autonomous language learning: Conceptions of learning and readiness for autonomy* (English Centre Monograph No. 2). Hong Kong: University of Hong Kong.
- Bentler, P. M., & Yuan, K.-H. (1999). Structural equation modeling with small samples: Test statistics. *Multivariate Behavioral Research*, 34, 181-197.
- Bol, L., & Garner, J. K. (2011). Challenges in supporting self-regulation in distance education environments. *Journal of Computing in Higher Education*, 23(2-3), 104-123.
- Bryman, A., & Cramer, D. (2005). *Quantitative data analysis with SPSS 12 and 13: A guide for social scientists*. Hove: Psychology Press.

- Büyükduman, İ., & Şirin, S. (2010). Learning portfolio (LP) to enhance constructivism and student autonomy. *Procedia-Social and Behavioral Sciences*, 3, 55-61.
- Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd ed.). Routledge: Taylor & Francis Group.
- Cantoni, V., Cellario, M., & Porta, M. (2004). Perspectives and challenges in e-learning: Towards natural interaction paradigms. *Journal of Visual Languages & Computing*, 15(5), 333-345.
- Chang, R., Fukuda, E., Durham, J., & Little, T. D. (2017). Enhancing students' motivation with autonomy-supportive classrooms. In M. Wehmeyer, K. A. Shogren, T. D. Little & S. J. Lopez (Eds), *Development of self-determination through the life-course* (pp. 99-110). Heidelberg: Springer.
- Cheon, S. H., Reeve, J., Yu, T. H., & Jang, H. R. (2014). The teacher benefits from giving autonomy support during physical education instruction. *Journal of Sport and Exercise Psychology*, 36(4), 331-346.
- Collins, H. (2008). Distance learning, autonomy development and language: Discussing possible connections. *DELTA: Documentação de Estudos em Lingüística Teórica e Aplicada*, 24, 529-550.
- Darab, B., & Montazer, G. A. (2011). An eclectic model for assessing e-learning readiness in the Iranian universities. *Computers & Education*, 56(3), 900-910.
- De Fátima Goulão, M., & Menedez, R. C. (2015). Learner autonomy and self-regulation in eLearning. *Procedia-Social and Behavioral Sciences*, 174, 1900-1907.
- Deci, E. L., Schwartz, A. J., Sheinman, L., & Ryan, R. M. (1981). An instrument to assess adults' orientations toward control versus autonomy with children: Reflections on intrinsic motivation and perceived competence. *Journal of educational Psychology*, 73(5), 642.
- Dickinson, L. (1994). Preparing learners: Toolkit requirements for preparing/orienting learners. In E. Esch (Ed.), *Self-access and the adult language learner* (pp. 39-49). London: CILT.

- Drennan, J., Kennedy, J., & Pisarski, A. (2005). Factors affecting student attitudes toward flexible online learning in management education. *The Journal of Educational Research, 98*(6), 331-338.
- Ertürk, N. O. (2016). Language learner autonomy: Is it really possible? *Procedia-Social and Behavioral Sciences, 232*, 650-654.
- Evans, M., & Boucher, A. R. (2015). Optimizing the power of choice: Supporting student autonomy to foster motivation and engagement in learning. *Mind, Brain, and Education, 9*(2), 87-91.
- Farivar, A., & Rahimi, A. (2015). The impact of CALL on Iranian EFL learners' autonomy. *Procedia-Social and Behavioral Sciences, 192*, 644-649.
- Field, A. (2009). *Discovering statistics using SPSS* (3<sup>rd</sup>. ed.). London: Sage Publications Ltd.
- Frizler, K. L. (1995). *The Internet as an educational tool in ESOL writing instruction* (Doctoral dissertation). San Francisco State University, USA.
- Hafner, C. A., & Miller, L. (2011). Fostering learner autonomy in English for science: A collaborative digital video project in a technological learning environment. *Language Learning & Technology, 15*(3), 201-23.
- Hagel, P., & Shaw, R. N. (2006). Students' perceptions of study modes. *Distance Education, 27*(3), 283-302.
- Hartley, K., & Bendixen, L. D. (2001). Educational research in the Internet age: Examining the role of individual characteristics. *Educational researcher, 30*(9), 22-26.
- Holec, H. (1981). *Autonomy and foreign language learning*. Oxford: Pergamon.
- Ivanova, O. I. (2017). The use of e-portfolio to develop English language learners' autonomy and independence. *Information Technologies and Learning Tools, 60*(4), 155-165.
- Jones, J. (2001). CALL and the teacher's role in promoting learner autonomy. *Call-EJ Online, 3*(1), 3-1.
- Kern, R. G. (1995). Restructuring classroom interaction with networked computers: Effects on quantity and characteristics of language production. *The Modern language journal, 79*(4), 457-476.

- Khoosf, S. G., & Khosravani, M. (2014). Introducing email portfolio as a means of developing EFL learner's autonomy. *Procedia-Social and Behavioral Sciences*, 98, 504-512.
- Kiany, G. R., Mahdavy, B., & Ghafar Samar, R. (2013). Motivational changes of learners in a traditional context of English education: A case study of high school students in Iran. *International Journal of Research Studies in Language Learning*, 2(1), 3-16.
- Lee, L. (2016). Autonomous learning through task-based instruction in fully online language courses. *Language Learning & Technology*, 20(2), 81-97.
- Lee, P. M. (2002). Behavioral model of online purchasers in e-commerce environment. *Electronic Commerce Research*, 2(1-2), 75-85.
- Little, D. (1991). *Learner autonomy: Definitions, issues and problems*. Dublin: Authentik.
- Little, D. (1999). Developing learner autonomy in the foreign language classroom: A social-interactive view of learning and three fundamental pedagogical principles. *Revista Canaria de Estudios Ingleses*, 38(38).
- Littlejohn, A. (1985). Learner choice in language study. *ELT journal*, 39(4), 253-261.
- Littlewood, W. (1996). Autonomy: An anatomy and a framework. *System*, 24(4), 427-435.
- Luzón, M. J. (2006). Providing scaffolding and feedback in online learning environments. *Mélanges, CRAPEL*, 28, 113-122.
- Magnan, S., Farrell, M., Jan, M. F., Lee, J., Tsai, C. P., & Worth, R. (2003). Wireless communication: Bringing the digital world into the language classroom. *Teaching with technology*, 171-179.
- Murray, G. L. (2011). Identity, motivation and autonomy: Stretching our boundaries. Identity, motivation and autonomy in language learning, 247-262.
- Najeeb, S. S. (2013). Learner autonomy in language learning. *Procedia-Social and Behavioral Sciences*, 70, 1238-1242.

- Parker, J., Maor, D., & Herrington, J. (2013). Authentic online learning: Aligning learner needs, pedagogy and technology. *Issues in Educational Research*, 23(2), 227-241.
- Peters, K. (2001). Individual autonomy in new forms of work organization. *Concepts and transformation*, 6(2), 141-158.
- Porto, M. (2007). Learning diaries in the English as a foreign language classroom: A tool for accessing learners' perceptions of lessons and developing learner autonomy and reflection. *Foreign Language Annals*, 40(4), 672-696.
- Reinder, H., & White, C. (2016). 20 years of autonomy and technology: How far have we come and where to next? *Language Learning & Technology*, 20(2), 143-154.
- Risemberg, R., & Zimmerman, B. J. (1992). Self-regulated learning in gifted students. *Roeper Review*, 15(2), 98-101.
- Scharle, A. & Szabo, A. (2000). *Learner autonomy: A guide to developing learner responsibility*. Cambridge: Cambridge University Press.
- Schmenk, B. (2005). Globalizing learner autonomy. *TESOL Quarterly*, 39(1), 107-118.
- Snodin, N. S. (2013). The effects of blended learning with a CMS on the development of autonomous learning: A case study of different degrees of autonomy achieved by individual learners. *Computers & Education*, 61, 209-216.
- Wright, S. (2005). A party of autonomy. *The Philosophy of Antonio Negri*, 1, 73-109.
- Yagcioglu, O. (2015). New approaches on learner autonomy in language learning. *Procedia-Social and Behavioral Sciences*, 199, 428-435.