Measuring the e-Learning Autonomy of Distance Education Students

Mehmet Firat
Anadolu University (Turkey)
mfirat@anadolu.edu.tr

Abstract

Previous studies have provided evidence that learner autonomy is an important factor in academic achievement. However, few studies have investigated the autonomy of distance education students in e-learning environments. The purpose of this study is to evaluate the e-learning autonomy of distance education students who are responsible for their own learning. For this purpose, as the first step of the study, an e-learning autonomy scale was developed. Analyses of the validity and reliability of the scale were carried out with the participation of 1,152 distance education students from Anadolu University, Open Education System. The scale has an internal consistency coefficient of α = 0.952 and a single factorial model that explains 66.58% of the total variance. The scale was implemented with 3,293 students from 42 different programs. According to the findings, student autonomy in e-learning environments is directly proportional to level of ICT use but not affected by program or gender.

Keywords: Distance education; autonomy; e-learning; lifelong learning

Introduction

Based on computer and Internet technologies, e-learning has laid a strong foundation for the realization of continuous learning. The use of advanced communication technologies for learning purposes has improved the abilities of distance education systems to serve larger learner groups, offering richer content and faster service. The expansion of distance education has not only led to an increase in the diversity or saturation of the instruments that it uses but also improved its theory. In other words, these new learning environments have not only enhanced the means of learning, but they have also influenced our opinions regarding the nature of learning (Bates, 1997). Thus, there has been a worldwide paradigm change from a cognitive-behaviorist, progressive, systematic concept of learning towards a concept in which learning is continuous, lifelong and Connectivist and learner autonomy is emphasized (Anderson & Dron, 2010).

Autonomy is one of the most important factor of self-learning. And self-learning is vital for distance education students. Learners take action toward becoming lifelong learners when they take responsibility for their own learning. So, determining autonomy of distance education has a critical importance (Jacobs, Renandya & Power, 2016). According to Moore (1972, 1993), learner autonomy occurs when the person who sets learning objectives, has learning experiences and makes assessment decisions regarding a learning program is the learner rather than a teacher or instructor.

This study has two main goals. The first goal of the study is to develop a valid and reliable scale that can be used to determine the autonomy of distance education students in e-learning environments. The second goal of the study is to use the developed scale to analyze the autonomy of students in e-learning environments based on their programs of study, gender and ICT usage level.

Theoretical Background

Most learning theories stipulate the desirability of the learners' acquisition of sufficient preparation, execution, and evaluation skills to conduct their own learning (Moore, 1972, p. 80). Precisely for this reason, after defining distance education for the first time, Moore (1972) discussed learner autonomy as the second dimension of independent learning. This is because in distance education, which is based on the idea that an individual will learn on his or her own unbounded by temporal and spatial restrictions, the learner is expected to benefit from the provided environment, tools and materials with his or her own self-control and free will (Andrade, 2014). Therefore, one of the indispensable learner competencies that is required for distance education is learning autonomy.

The notion of autonomy in education views the purpose of teaching as helping learners attain ideal individual learning behavior. This approach targets learner practice-focused, independence and responsibility as essential parts of all learning processes (Boud, 2012; Xu, 2013). According to Lynch and Dembo (2004), learner autonomy is a critical factor in successful online distance learning. Tschofen and Mackness (2012) discussed autonomy as one of the key principles of learning in connectivism. Additionally, Anderson and Dron (2010) found that the first task of Connectivist education involves exposing students to networks and providing opportunities for them to gain a sense of self-efficacy in network-based cognitive skills and the process of developing their own Internet presence.

The literature on learning autonomy offers various definitions for the term. These definitions include the ability to learn in a logical and appropriate manner (Holec, 1981), the capacity of a student to take control of his or her own learning (Benson, 2001), and the ability to function autonomously in self-directed learning and self-regulated learning processes (Loyens, Magda & Rikers, 2008). According to Betts (2004), an autonomous student is an independent and life-long learner. In its broadest sense, learner autonomy refers to a learner's intervention in his or her own learning. According to Little (1991), to do this, the learner must have the capacity for critical reflection, decision making, and independent action. Lynch and Dembo (2004) defined five components of learner autonomy that are especially important for distance learner success. These components are motivation (self-efficacy and goal orientation), Internet self-efficacy, time management, study environment management, and learning assistance management. On the other hand, Arnold (2006) identified 11 factors that promote autonomy in the online environment: flexible access, learning facilitation, self-selection, a lack of face-to-face contact, media choices, community peer learning and dialogue, peer review, negotiated learning activities, self evaluation, evaluation of performance, and reflection on learning.

As a contemporary theory of intrinsic-extrinsic motivation that is built on the fundamental premise of learner autonomy, self-determination theory (SDT) argues that all humans have an intrinsic need to be autonomous in their environment (Deci & Ryan, 2011). Recent research (Chen & Jang, 2010 and Hartnett, 2010, cited in Hartnett, George & Dron, 2011; Andrade, 2014) has demonstrated that self-determination theory can be useful in the study of e-learning motivation. According to Hartnett et al. (2011), although only a few studies have adopted this framework, more have begun to emerge.

Related Literature

Studies in distance education indicate that learner autonomy is an important factor in determining academic success (Holmberg, 1995; Keegan, 1996; Peters, 1998; Jung, 2001; Kearsley, 2000; Lynch & Dembo, 2004; Yen & Liu, 2009). However, viewing learner autonomy as just a component of academic success does not explain how autonomous learners work in e-learning environments and how they effectively make use of their autonomy (Lynch & Dembo, 2004). Learner autonomy

or learner independence is a major contribution to success in e-learning environments in which learners are responsible for their own learning (Zimmerman, 2002). Learning autonomy plays an important role in achieving lifelong learning (Ariza & Sánchez, 2013). According to Zimmerman (2002), learner autonomy also contributes to the attainment of comprehensive educational goals such as improving life-long learning skills.

In a study conducted by Seiver and Troja (2014), satisfaction and success in online learning were analyzed as functions of belonging, autonomy, and expertise. Two studies have analyzed the relationships between motivation, satisfaction and online learning success. The results of these studies showed that the need for affiliation plays a significant role in a student's satisfaction with his or her online learning experience, and the need for autonomy and mastery are less important; thus, the need for autonomy is not significantly related to students' willingness to learn.

A study that was carried out by Hartnett et al. (2011) attempted to determine the learning motivations of teacher candidates studying in two online distance-learning environments. SDT was used as a framework. The study found that the learners were not primarily intrinsically motivated. Another study that was conducted by Scott, Furnell, Murphy and Goulder (2013) tried to determine teacher and learner opinions about learner autonomy in the field of biology. To this end, 28 teachers were interviewed, and 84 students were surveyed. The results showed that the number of years that were spent by the students in the university program did not affect their learning autonomy. Furthermore, it was found that learning autonomy was affected by personal and social factors rather than by other factors.

An analysis of the relevant literature found that learner autonomy has been researched intensively, especially in foreign language education (Holec, 1981; Benson, 2001; Furnborough, 2012; Kelly, 2014). Furthermore, various studies of learner autonomy have been performed in many different fields including psychotherapy (Holec, 1981; Kelly, 2014), emotional autonomy (Schmitz & Baer, 2001) and foreign language learning (Beck, Epstein, Harrison & Emery, 1983; Schwienhorst, 2012). While there have been studies in many fields, there has been a lack of studies on the learner autonomy of distance education students, especially those in e-learning environments. This gap has been frequently underscored in the relevant literature in recent years (Arnold, 2006; Macaskill & Taylor, 2010; Hartnett et al., 2011; Seiver & Troja, 2014). Due to this gap, many studies have even cited research on autonomy in foreign language learning (Aliweh, 2011). However, no scale exists for learner autonomy in general and for learner autonomy in e-learning environments in particular (Furnborough, 2012). Therefore, this study seeks to fill this gap in the relevant distance education literature and to provide a direct perspective on the autonomy of distance education students in e-learning environments.

Method

This study was conducted to determine the distance education students' autonomy in e-learning environments. For this purpose, an e-learning autonomy scale was developed as first step of the study. Developed e-LAS scale used to analyze the autonomy of students studying in the e-learning environments as a function of their program, gender and ICT usage level as first step of the study. e-LAS scale designed as an online questionnaire to collect data from distance education students. Some important advantages of online questionnaires include their ease of storage, retrieval, and qualitative analysis (Murthy, 2008).

Participants

Distance education has students from all ages, professions and socio-economic groups. These features are important to generalize the research results because learners vary in their ability to exercise autonomy and autonomy varies from program to program (Moore, 2013). It is possible to analyze the participants in this study in two groups. The first group includes the 1,152 distance education students from Anadolu University, Open Education System who participated in the e-LAS scale validity and reliability analyses. These students were from 38 different programs (5 undergraduate and 33 associate degree programs) during the 2014–2015 academic year. The lowest rate of participation was from the Brand Communication program, with 12 students, and the highest participation rate was from the Business Administration degree program, with 305 students. The reason for this difference is the varying number of total enrolled students in these programs. Thus, the number of participants in the study parallels the total number of enrolled students in these programs.

The second group of participants includes those involved in the e-LAS scale implementation, which was composed of 3,293 students from 42 different programs (6 undergraduate and 36 associate degree programs) during the 2014–2015 academic year. Of the students who participated in the study, 36.4% were females and 63.6% were males. The students in the distance education system were asked a multiple-choice question with three options regarding how they rate themselves in terms of ICT use. According to the responses that were given by the students, only 8.2% see themselves at a basic user level, while 46.1% see themselves as medium-level users, and 45.7% think they are at an advanced level. This shows that the students who participated in the study see themselves as competent in the use of ICT.

Development of the e-Learning Autonomy Scale (e-LAS)

In the determination of the e-LAS scale items, these criteria by Moore (1972, 1993), Little's (1991) autonomy skills, Lynch and Dembo's (2004) five components of learner autonomy that are especially important for distance learning and Arnold's (2006) 11 factors that promote autonomy in an online environment were all taken into account. Accordingly, some of the expressions that are utilized for the items on the scale are *planning learning experiences, evaluating learning performance, determining learning goals, self-control of learning process, taking responsibility for decisions* and *assessment of learning needs*.

Scale development in the social sciences involves formulating an item pool, soliciting expert opinions, conducting factor analysis and estimating reliability (DeVellis, 2012). In this study, an item pool was formed before the implementation, expert opinions were consulted, and a pilot study was conducted. The necessary permissions were obtained from the university administration for implementation. After the implementation, the validity and reliability were analyzed.

For the Turkish version of the e-LAS scale, an item pool was prepared based on the relevant literature. The item pool consisted of 15 items, 10 items were selected by following the suggestions of 3 field specialists. The field specialists were an associate professor of adult learning, an assistant professor of instructional technologies, and a distance learning specialist assistant professor. A draft of the scale form was made using the items that were suggested by the field specialists. The pilot study was conducted with 12 distance education students. As a result of this pilot study, one item was revised to make it more readable. Half of the items were negatively worded. Following each item was a five-point Likert-type scale of potential responses: *strongly agree*, *agree*, *neutral*, *disagree*, and *strongly disagree*. The participants checked the place on the scale that best reflected their feelings about an item. The maximum possible score on the scale was 50, and the minimum was 10. Translated e-LAS scale given in Appendix 1.

Data Analysis

The descriptive statistics of percentage (%), frequency (f), standard deviation (SD), and mean ($\bar{X}$) as well as the parametric independent sample t-test and one-way ANOVA were used in the analysis of the data that were obtained from the application of the e-LAS scale to the distance education students. The statistical tests in the study were conducted using IBM SPSS 22.

Results

The findings regarding the two basic aims of the study are presented in this section. The findings are presented under two headings that correspond to each aim.

Analyses of e-LAS Validity and Reliability

The first goal of the study was to develop a valid and reliable scale that could be used to determine the autonomy of distance education students in e-learning environments. To this end, for the validity analysis of the e-LAS scale, several analyses were conducted in addition to the explanatory factor analysis. Based on the correlation matrix of the variables that were involved, a correlation factor analysis, which is a technique that requires a large sample size, was used. Tabachnick and Fidell (2001) provided a guideline on sample size: 100 is poor, 200 is fair, 300 is good, 500 is very good, and 1000 or higher is excellent. In this study, 1,152 distance education students participated in the e-LAS factor analysis application.

To determine how well the data from the distance education students matched the factor analysis, a Kaiser-Meyer-Olkin (KMO) value was calculated. Ranging between 0 and 1, the KMO value is normal between 0.5 and 0.7, good between 0.7 and 0.8, very good between 0.8 and 0.9 and perfect over 0.9 (Field, 2005; Sharma, 1996). Furthermore, the significant result of the Bartlett's Sphericity Test was interpreted as good for the factor analysis of the sample size and the convenience of the correlation matrix (Field, 2005; Tabachnick & Fidell, 1996). As a result of the analyses, the KMO value was found to be 0.943, and the Bartlett Sphericity Test iχ2 value was found to be 10329.547 (p < 0.001). According to the obtained results, the data matrix from the work group was determined to be convenient for the factor analysis.

To determine the discrimination power of each item on the e-LAS scale in discriminating individuals, the item validity was analyzed. To this end, an item analysis that was determined according to each item score of the scale based on the lower 27% and upper 27% group median differences was conducted through an independent samples t-test. To determine the item discrimination of e-LAS, an item analysis was used. Maximum likelihood was used as the extraction method. The inter-item correlation was found to be r = 0.666. The item analysis findings are presented in Table 1.

Table 1: Results of Item Validity Analysis

Items	Corrected Item-Total Correlation	Upper-lower 27% Difference
Item 1	0.773	$t_{(621)}$ = 19.775, p < 0.001, MD = 1.41181
Item 2	0.802	$t_{(621)}$ = 19.139, p < 0.001, MD = 1.36083
Item 3	0.790	$t_{(621)}$ = 21.140, p < 0.001, MD = 1.51474
Item 4	0.744	$t_{(621)}$ = 20.504, p < 0.001, MD = 1.44678
Item 5	0.758	$t_{(621)}$ = 20.811, p < 0.001, MD = 1.44474

Items	Corrected Item-Total Correlation	Upper-lower 27% Difference
Item 6	0.795	$t_{(621)}$ = 21.735, p < 0.001, MD = 1.55585
Item 7	0.796	$t_{(621)}$ = 22.337, p < 0.001, MD = 1.59125
Item 8	0.823	$t_{(621)}$ = 30.377, p < 0.001, MD = 1.81960
Item 9	0.832	$t_{(621)}$ = 32.264, p < 0.001, MD = 1.86178
Item 10	0.868	$t_{(621)}$ = 53.248, p < 0.001, MD = 2.27240

MD= Mean Difference

The analyses that are presented in Table 1 show that the t values for the 27% upper-lower group differences were significant at p < 0.001. This finding demonstrates that each item of the e-LAS scale has discriminatory power. The item total correlations ranged between 0.758 and 0.868. These findings suggest that the scale items have a high level of discriminatory validity.

To determine the factor structure of e-LAS, an explanatory factor analysis was conducted. The factor analysis was performed using the maximum likelihood and Varimax rotation techniques. The maximum likelihood analysis revealed one component with an eigenvalue of 7.28, which explains 66.58 percent of the total variance. The scale item loading on a single factor varied from 760 at the lowest to 869 at the highest. Loadings in excess of 0.71 are considered excellent (Tabachnick & Fidell, 2001). Because the e-LAS had such a strong single-factor structure, a confirmatory factor analysis was not conducted.

Reliability analyses were conducted using both the Cronbach's α coefficient and split-half Spearman Brown for equal length methods to establish the internal consistency characteristics of the scale. The Cronbach's α coefficient was used to determine the internal consistency of the scale, and the split-half method was used to find the internal stability. As a result of the internal consistency analysis, the Cronbach's α coefficient was found to be α = 0.952 with p < 0.001. Additionally, all of the Cronbach's α coefficients for item deleted values of 10 items were lower than 0.952. As a result of the reliability analysis that was conducted using the split-half method, the Spearman Split-Half Coefficient value of the test was found to be 0.919 with p < 0.001. These findings show that the e-LAS scale measured the autonomy of the distance education students in e-learning environments in a valid and reliable way.

The e-Learning Autonomy of Distance Education Students

The second goal of the study was to use the e-LAS to analyze the autonomy of students studying in the e-learning environments as a function of their program, gender and ICT usage level. For this purpose, various descriptive statistics and parametric tests were used. When the descriptive statistics of the student scores on the e-LAS scale were analyzed, the students had a high average ($\overline{X}$ = 37.97, Sd = 8.54). Considering that the maximum possible score on the scale is 50, this finding, which was obtained within the limitations of the study, indicates that the students who participated in the study have an adequate level of autonomy in e-learning environments.

Distance education of the University can be categorized as associate degree, undergraduate degree, completely distance (electronic environment), and internship requiring (face-to-face). Thus, to determine whether the program types (associate versus undergraduate degree and distance versus face-to-face) affected their degrees of autonomy in e-learning environments, these types were compared using an independent samples t-test. According to the results of the independent

samples t-test, no significant difference was found between the e-LAS scores of the students in the four-year undergraduate programs and those of the students in the two-year associate degree programs [$t_{(3291)}$ = 0.71, p = 0.472 > 0.05]. The autonomy of the students in e-learning environments does not statistically vary with the characteristics of their programs. However, because the program types and study methods differ, the e-LAS averages also varied.

The type of degree, i.e., undergraduate or associate, did not have a significant effect on the e-LAS averages. However, the e-LAS averages of the students that performed their coursework on e-learning platforms were higher than those of the students that studied in programs that required internships. Additionally, the e-LAS scores were compared by gender with the help of an independent samples t-test. This t-test showed that there was no significant difference between the e-LAS scores when compared by gender [$t_{(3291)}$ = 1.79, p = 0.472 > 0.05].

The e-LAS scores were also compared by level of ICT use. For this purpose, a one-way ANOVA test was used. This analysis revealed a significant difference between the groups [$F_{(2,3290)}$ = 40.657, $p < 0.001$, MS = 2897.45]. To determine the differences between the various groups, one of the most common post hoc (multiple comparisons) tests, the Bonferroni test, was used. According to the multiple comparisons test, the e-LAS average of the students with *advanced level* ICT use was significantly higher than the e-LAS average of the students with *medium level* ICT use (MD = 1.923, p < 0.001) and the e-LAS average of the students with *basic level* ICT use (MD = 4.442, p < 0.001). Similarly, the e-LAS average of the students with *medium level* ICT use was significantly higher than the e-LAS average of the students with *basic level* ICT use (MD = 2.513, p < 0.001). These findings indicate that, as ICT use of the distance education students increases, their autonomy in e-learning environments also increases.

Discussion

This study was conducted to accomplish two main goals. According to the first aim of the study, the e-LAS scale was developed, and validity and reliability analyses were conducted. After it was analyzed for its validity and reliability, the e-LAS scale was implemented with the distance education students. The relevant literature was also reviewed and used in the development of this e-LAS scale. The validity and reliability analyses confirmed that the e-LAS scale, which was comprised of 10 items with a 5-point Likert-type scale, was valid and reliable. The scale has an internal consistency coefficient of α = 0.952 and a single factor structure that explains 66.58% of the total variance.

For the second aim of the study, the e-LAS scale was implemented with the students studying in the University distance education system. The autonomy of the participants in this learning environment was found to be high. This finding differs from Hartnett et al.'s (2011) finding that learners are primarily not intrinsically motivated. The students' e-LAS scores were also compared based on program, gender, and level of ICT use. The analyses indicated significant differences based on level of ICT use. These findings demonstrate that the higher the ICT use of the distance education students, the higher their autonomy in e-learning environments.

Lynch and Dembo (2004) underscored the need to compare the autonomies of learners who take completely online, blended, less-structured or highly structured courses. Following this suggestion, in this study, the learning autonomies of students in associate degree, undergraduate degree, completely distance (electronic environment), and internship requiring (face-to-face) programs were compared, but no significant differences were identified. This finding supports that of Scott et al. (2013) who claimed that learning autonomy does not change depending on how many years a student has been enrolled in a university program.

Conclusions and Suggestions

The previous research analyzed the effect of learner autonomy on academic success and foreign language learning. This study, however, analyzes the autonomy of distance education students in e-learning environments. For this purpose, an e-LAS scale was developed. Validity and reliability tests determined that the e-LAS scale, which is comprised of 10 items with a 5 point Likert-type scale and has a single-factorial structure, explains 66.58% of the total variance and has an excellent internal consistency (α = 0.952). In this study, 1152 distance education students from 38 different programs (5 undergraduate and 33 associate degrees) participated in the development of the scale. Afterwards, the scale was implemented with 3,293 distance education students from 42 different programs (6 undergraduate and 36 associate degrees).

To accomplish the second aim of the study, the autonomy of distance education students in e-learning environments was analyzed using the e-LAS scale. The autonomies of the distance education students in e-learning environments were found to be high. The autonomy of the students does not vary with program or gender but is directly proportional to level of ICT use. Given the limitations of the study, the autonomy of the distance education students in e-learning environments can be said to be affected by ICT use. Consequently, to support the autonomy of distance education students in e-learning environments, it is necessary to increase their ICT literacy. As such, in terms of ensuring their autonomy in e-learning environments, the computer literacy, Internet literacy, and more broadly, the media literacy of the distance education students can be said to be very important.

Implications

As an important outcome of this research e-LAS can be used to determine the autonomy of distance education students in e-learning environments. Thus, the necessary precautions can be taken to support the autonomy of the students. The effect of ICT use on autonomy in e-learning environments were determined in this research. Improving students' ICT literacy and technology use can support also the autonomy of the students. Especially, distance education students should be supported by training and courses in this regard.

Limitations and Future Research

This study was conducted to determine the autonomy of distance education students in e-learning environments and included the following limitations:

- the autonomy of distance education students in e-learning environments,
- the validity and reliability of the e-LAS scale were analyzed with 1,152 distance education students, and
- the implementation of e-LAS was conducted with 3,293 students from 42 different programs (6 undergraduate and 36 associate degree programs) in a University.

It is possible to suggest future researches by taking these limitations into consideration. In future studies, e-LAS scale can be used to determine the autonomy of different universities and countries distance education students in e-learning environments. For this, scale adaptation studies can be conducted. In the future researches the autonomy of distance education students and face-to-face students can also be compared in e-learning environments.

References

Aliweh, A. M. (2011). The effect of electronic portfolios on promoting Egyptian EFL college students' writing competence and autonomy. *Asian EFL Journal*, *13*(2), 90–132.

Anderson, T., & Dron, J. (2010). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning*, *12*(3), 80–97. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/890/1826

Andrade, M. (2014). Course-embedded student support for online English language learners. *Open Praxis*, *6*(1), 65–73. http://dx.doi.org/10.5944/openpraxis.6.1.90

Ariza, A., & Sánchez, M. S. (2013). Effectiveness of the Integration of ICT Tools and Activities to Foster Awareness as the First Stage to Reach Learning Autonomy. *Gist: Revista Colombiana de Educación Bilingüe, 7*, 154–172.

Arnold, L. (2006). Understanding and promoting autonomy in UK online higher education. *International Journal of Instructional Technology & Distance Learning*, *3*(7).

Bates A. W. (1997). The Impact of Technological Change on Distance Learning. *Distance Education*, *18*(1), 93–109, http://dx.doi.org/10.1080/0158791970180108

Beck, A. T., Epstein, N., Harrison, R. P., & Emery, G. (1983). Development of the Sociotropy-Autonomy Scale: A measure of personality factors in psychopathology. *Unpublished manuscript, University of Pennsylvania, Philadelphia*.

Benson P. (2001). *Teaching and researching autonomy in language learning*. Harlow: Pearson Education.

Betts, G. (2004). Fostering autonomous learners through levels of differentiation. *Roeper Review*, *26*(4), 190–191.

Boud, D. (Ed.). (2012). *Developing Student Autonomy in Learning*. Routledge.

Deci, E. L., & Ryan, R. M. (2011). Self-determination theory. *Handbook of theories of social psychology, 1*, 416–433.

DeVellis, R. F. (2012). *Scale development: Theory and applications* (Vol. 26). Sage publications.

Field, A. (2005). *Discovering Statistics using SPSS* (fourth edition), Sage Publications Ltd., London.

Furnborough, C. (2012). Making the most of others: autonomous interdependence in adult beginner distance language learners. *Distance Education*, *33*(1), 99–116. http://doi.org/10.1080/01587919.2012.667962

Hartnett, M., George, A. S., & Dron, J. (2011). Examining motivation in online distance learning environments: Complex, multifaceted and situation-dependent. *The International Review of Research in Open and Distributed Learning, 12*(6), 20–38. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1030/1954

Holmberg, B. (1995). *Theory and Practice of Distance Education*. London: Routledge.

Holec, H. (1981). *Autonomy and foreign language learning*. Oxford: Pergamon.

Jung, I. (2001). Building a theoretical framework of web-based instruction in the context of distance education. *British Journal of Educational Technology, 32*(5), 525–534. http://dx.doi.org/10.1111/1467-8535.00222

Jacobs, G. M., Renandya, W. A., & Power, M. (2016). Learner Autonomy. In *Simple, Powerful Strategies for Student Centered Learning* (pp. 19–27). Springer International Publishing.

Kearsley, G. (2000). *Online education: learning and teaching in cyberspace*. Belmont, CA.: Wadsworth.

Keegan, D. (1996). *Foundations of distance education*, (3rd edition). London: Routledge.

Kelly, M. (2014). *Fostering autonomy, generating motivation and shaping identities in the adolescent language classroom—an experimental research project.* PhD thesis, Dublin City University.

Little, D. (1991). *Learner Autonomy: Definitions, Issues, and Problems*. Dublin: Authentik.

Loyens, S. M. M., J. Magda, and R. M. J. P. Rikers. (2008). Self-directed learning in problem based learning and its relationships with self-regulated learning. *Educational Psychology Review, 20*, 411–27. http://dx.doi.org/10.1007/s10648-008-9082-7

Lynch, R., & Dembo, M. (2004). The relationship between self-regulation and online learning in a blended learning context. *The International Review of Research in Distance Learning, 5*(2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/189/271

Macaskill, A., & Taylor, E. (2010). The development of a brief measure of learner autonomy in university students. *Studies in Higher Education, 35*(3), 351–359.

Moore, M. G. (1972). Learner autonomy: The second dimension of independent learning. *Convergence, 5*(2), 76–88.

Moore, M. G. (1993). 2 Theory of transactional distance. *Theoretical Principles of Distance Education*, 22.

Moore, M. G. (2013). The theory of transactional distance. In M. G. Moore (Ed.), *Handbook of Distance Education* (3rd ed., pp. 66–85). Routledge.

Murthy, D. (2008). Digital ethnography an examination of the use of new technologies for social research. *Sociology, 42*(5), 837–855.

Peters, O. (1998). *Learning and Teaching in Distance Education: Analyses and interpretations from an international perspective.* London: Kogan Page.

Schmitz, M. F., & Baer, J. C. (2001). The vicissitudes of measurement: A confirmatory factor analysis of the emotional autonomy scale. *Child Development, 72*(1), 207–219.

Scott, G. W., Furnell, J., Murphy, C. M., & Goulder, R. (2013). Teacher and student perceptions of the development of learner autonomy; a case study in the biological sciences. *Studies in Higher Education*, 1–12.

Schwienhorst, K. (2012). *Learner autonomy and virtual environments in CALL*. Routledge.

Seiver, J. G., & Troja, A. (2014). Satisfaction and success in online learning as a function of the needs for affiliation, autonomy, and mastery. *Distance Education, 35*(1), 90–105. http://dx.doi.org/10.1080/01587919.2014.891427

Sharma, S. (1996). *Applied Multivariate Techniques*. New York: John Wiley and Sons Inc.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics* (fourth edition), New York: College Publishers.

Tschofen, C., & Mackness, J. (2012). Connectivism and dimensions of individual experience. *The International Review of Research in Open and Distributed Learning, 13*(1), 124–143. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1143

Xu, W. (2013). A New Interactive Method to Distance English Learning in Conceptual Age. *Open Praxis*, *5*(4), 335–344. http://dx.doi.org/10.5944/openpraxis.5.4.94

Yen, C. J., & Liu, S. (2009). Learner autonomy as a predictor of course success and final grades in community college online courses. *Journal of Educational Computing Research, 41*(3), 347–367.

Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner: an overview. *Theory into Practice, 41*(2), 64–70.

Appendix 1. e-Learning Autonomy Scale (e-LAS)[*]

Instructions: Please read each of the following statements carefully. Next to each statements, select the number that represents how strongly you feel about the statement by using the following scoring system: *Strongly Disagree* (1), *Disagree* (2), *Neutral* (3), *Agree* (4) and *Strongly Agree* (5).					
In e-learning environments . . .	1	2	3	4	5
1- I plan my own learning experiences.	1	2	3	4	5
2- I don't evaluate my own studies.	1	2	3	4	5
3- I don't arrange environment for myself.	1	2	3	4	5
4- I track my learning performance.	1	2	3	4	5
5- I don't take responsibility for my decision.	1	2	3	4	5
6- I control my own learning process.	1	2	3	4	5
7- I set my own learning strategy.	1	2	3	4	5
8- I don't determine my own learning needs.	1	2	3	4	5
9- Decisions are not belong to me.	1	2	3	4	5
10- I determine my own learning goals.	1	2	3	4	5

[*] e-Learning Autonomy Scale translated from original Turkish language.