

Full Length Research Paper

Developing a scale on the usage of learner control strategy

M. Oğuz KUTLU

Cukurova University, Education Faculty, Adana, Turkey. E-mail: okutlu@cu.edu.tr.

Accepted 11 February, 2012

The aim of this study was to develop a Likert-like scale in order to measure teachers' usage level of learner control strategy. This study was carried out with 219 State primary school teachers who were class teachers, Turkish teachers, English teachers, Mathematics teachers, Science teachers, Social Sciences teachers, Religion and Moral teachers and Computer and Technology teachers in the province of Adana in Turkey in the 2010 and 2011 academic years. The data obtained from the factor analysis, the measurement of Kaiser Meyer Olkin (KMO) was found to be 0.827 and the measurement of Bartlett test was found to be 1185.515. According to these results, 5-point likert type scale consisting of 28 items and their load factor ranged from 0.80 to 0.45 were very good and moderate so the scale was created. During the development of the scale, factor analysis was used for constructing validity; Cronbach's alpha coefficient was used for internal consistency and validity. According to the results of the factor analysis, the KMO 0.827 and Bartlett's test 1185.515 were significant at the level of 0.000. Cronbach's alpha coefficient was measured as 0.8819.

Key words: Learner control strategy, constructivism, elaboration theory, component display theory, computer assisted instruction.

INTRODUCTION

Learning process is considered not a passive process rather so active that both teacher and learners should work together. In today's societies, it is vital for the individuals to have not only basic knowledge and skills but also to have the ability of thinking, interpreting, analyzing, evaluating and solving the problems when the need arises. For this reason, teachers should differentiate their instructional approaches as also stated by other researchers (Saban, 2005). Teaching content of micro-level selecting, editing, moving, merging and recommendations about level with the macro summaries has been developed for this purpose (Reigeluth and Stein, 1983). Some of the instructional designers state that if learners make selection, teaching strategies and techniques, the learners can raise their motivation, which encourage their involvement (Williams, 1996). Learners are not passive recipients in teaching and learning environments. However, in traditional classes, learners are considered as the passive recipients which affect both the teachers' instructional approaches and learners'

learning styles if the appropriate level authority control and responsibility are given to students whose motivation at the top level within their own learning, the effectiveness and attractiveness of teaching may increase. Students should be free about choosing the teaching strategies and ordering the contents in the strategy of learner control. They should also have the ability of controlling their own learning and studying (Reigeluth, 1987). Learner control is the opportunity and ability to directly influence and determine decisions related to the educational process (Baynton, 1989). In such kinds of events, decision making of learner and control of the learning process are factors. There are abundant research about learner control strategy for instance, Polizzi (2008) investigated the relationships between employee self efficacy, computer self efficacy, supervisory support, gender and age and their effect on metacognitive activity. The research was conducted during organizationally sponsored, learner controlled training among adults. The study results suggest a positive

role for supervisory support on self-efficacy and metacognitive activity. Metacognitive activity increased with higher levels of learner control self efficacy which, in turn, was associated with higher levels of computer self efficacy. In other research Yao (2006) tried to verify whether the positive effects of the roll-over annotation presentation format on reducing cognitive load and enhancing vocabulary and comprehension of 5th-grade children (Morrison, 2004) can be extended to college students' learning from a web-delivered text. Finally, choices of annotation presentation formats should be well-conceived to balance cognitive load, learning, and learner control. It was found out, in the course of reviewing literature, that Baynton's scale on the learners' usage of learner control strategy, however, did not develop a scale on teachers' usage level of learner control strategy, so the problem of this research was to develop a new scale on teachers' usage level of learner control strategy with respect to the elaboration theory. A novel scale which included 28 items and Cronbach's alpha coefficient was measured as 0.8819.

Elaboration theory

The purpose of the elaboration theory is to disseminate the component display theory (CDT) developed by Merrill (1984) at a macro level and offer recommendations for the choice of teaching content, sequencing and synthesis (Reigeluth, 1987: 245). In other words, the aim of the theory about teaching and learning is to bring together all existing information at a macro level as far as possible (Reigeluth, 1983: 337). This theory refers to some of the motivational cognitive elements of the strategy, which are similar to CDT, however, the important thing is that elaboration theory is determined by ranking from simple to complex, the provided content structure and the importance of the different information taught in order to be aware of the relationships between the information (Reigeluth, 1983: 341). Elaboration theory is relevant to the design of instruction for the cognitive domain. Thus, ranking allows learners to improve their mastery of the level of complexity information given by helping them to determine which is suitable and more meaningful for the teaching and learning process. A very deep level of complexity that may be necessary for series of learning in the pre-condition by not having to fight, interesting and significant levels of complexity can come from the outset faced. A key idea of elaboration theory is that the learner needs to develop a meaningful context into which subsequent ideas and skills can be assimilated. Elaboration theory proposes seven major strategy components: (1) an elaborative sequence, (2) learning prerequisite sequences, (3) summary, (4) synthesis, (5) analogies, (6) cognitive strategies, and (7) learner control. It is claimed that the elaboration approach results in the formation of more stable cognitive structures and

therefore better retention and transfer, increased learner motivation through the creation of meaningful learning contexts, and the provision of information about the content that allows informed learner control.

Learner control

Learner control includes strategy selection and using the selected strategies to fulfill the needs of learners during teaching process which enable learners to perform well. During this process the more the learners can choose, order and improve their abilities, the more they control their own learning. Teaching process involves comprehending and improving teaching methods, which in turn help learners control themselves in a possible way during learning process. According to Reigeluth (1979), the purpose of teaching is to make teaching process more effective, more productive and more attractive. According to Reigeluth (1987) learner can choose the control about elements of teaching strategy and a macro prescriptive framework for selecting, sequencing, synthesizing and summarizing the content. In addition, learner control increases learner's performance and also learner control can be used in some level in every teaching (Merrill, 1984). Supplying learner control strategy is not important, rather using this strategy is more important. Merrill's (1984) categorizes level of student's control as 1. Content control 2. Control of pace 3. Display (strategy) control. 4. Control of internal processing. Learners develop an internal process triggering their own learning, so they use metacognition and they are aware of their own cognitive structure and learning features. According to Gage and Berliner (1988) and Klausmeier (1985) metacognition is the knowledge about learner's own cognitive system, structure and study. In other words, metacognition involves learners' awareness of their own internal process about their own success in the learning process. Learner control strategies' options can be described as opportunities to analyze learners' own comprehension, needs and to use instructional components according to analyzed needs. For instance, if teacher allows students to choose their own group partners, it can be described as a learner control option. Learner control enables learners to determine the teaching strategies and to decide on cognitive strategies, and they can also gain appropriate strategies and skills during such a process (Merrill, 1984). Santiago and Okey (1992) emphasized that learner control is effective in the control of content, control of pace, control of strategy, control of internal processing (metacognition), control of decision, exercise, kind, time and amount with a little or completely alternative installation of the responsibility in the scope of instructional design. In addition, according to Cook (2001) learner control is a strategy learners use to make decisions about teaching process during which learners

control their own learning process. Research on learner control can be classified into two categories. The first one examines the effects of learner control strategies by having students who choose and control one or more instructional options such as pacing, sequencing, amount of practice, difficulty level, reviewing, content selection, completion time, feedback, and instructional strategies (Kinzie et al., 1988; Klein and Keller, 1990; Lopez and Harper, 1989; Steinberg, 1977, 1989; Yang, 1991). The second deals with the relationships between learner control and learner characteristics other than instructional options, such as general ability, prior knowledge, cognitive style, and locus of control (Yang, 1991).

Learner control and constructivism

Learner control provides students with a wide number of employing strategy options or complete responsibility in teaching and learning environment (Santiago and Okey, 1992). According to constructivist view, learning is a construction process based upon a particular object, event, the fact outside the world or concept about structure, which helps an individual to interpret information in his/her mind or interpret the processes which refer to a conglomeration of previous experiences (Jonassaen, 1994). The learners can have beliefs about something which has already been constructed and these beliefs are affected by factors such as the social and cultural environments in which they are grown up. Human mind can use a filtering system in the interpretation process which is based upon the attitudes, beliefs and values obtained in advance from the outside world according to events, cases and concepts (Deryakulu, 2000). Individual experiences are the results of their previous information (prior knowledge) to which they refer when they interpret and unify the information. In this way learner and individual make information internal and unique. Every individual has different and unique information structure resulting from the fact that every individual has individual information and experience. Every individual perceives, assimilates and makes construction according to his own memory. Learner control strategy helps learners build the cognitive structure which help them to comprehend complex situations much more easily, through either directive or constructivist approach. Constructivists approach is the organization of activity which is fundamentally self-referent and self-repeating; people continually experience and monitor their sense of personal identity.

Learner control and computer assisted instruction

The role and the capabilities of personal computer technology are becoming more and more varied in society today. Ideally, education should be able to expose

this multi-ability technology to its incredible variety of students (Miller, 1996). Computer based training designs allow users to exert significant control over sequence of learning, content and pace of instruction (Bell and Kozlowski, 2002). In a review of the literature about effectiveness of learner control in computer-assisted instruction, Lunts (2002) reports that the amount of learner control affects the effectiveness of the method, with greater control associated with improved creativity and learner initiative. Also, Lunts (2002) reports that, generally, the literature suggests that learner control are a useful tool for adapting a learning environment to students' need. Learner control strategy positively affects motivation and the amount of effort invested in the learning task (Perez et al., 2010). Learner control, computer assisted instruction and student-centered teaching start to be important in teaching and learning environment. Learner control starts to be an important strategy in computer assisted learning and student-centered instruction, because individualism is effective for learners in both instructions. Computer-assisted learning provides choosing (selection) of content, exercise, variety and speed such that individuals can control their own learning process according to their own speed with the help of computers.

Aims

The aim of this study is to develop a scale about teachers' using level of learner control strategy. The study about the validity and reliability will be carried on the data obtained from the scale which will be developed for this purpose

Limitations of this study

- (1) This study is limited to the 2010 to 2011 academic year.
- (2) This study is limited with the number of teachers used in the study.
- (3) This study is limited to the scale of the positive statements.

METHOD

Study group

The population of the study group comprises all the teachers in state primary schools in Adana-Turkey. The study group as a sample of the population used for this research was selected randomly. The study group included 219 state primary school teachers studying in Adana (Turkey) state primary schools located in the center of Adana in 2010 to 2011 academic year. The sample was randomly chosen and comprised 91 men (42%) and 128 women (58%) teachers who participated in this research. In addition, 123 class teachers (56%), 20 Turkish teachers (9%), 20

expression changing were changed so the data collection tool was given final shape.

FINDINGS

The scale which measures the teachers' using level of control strategy and given the last form applied to the group included 219 teachers. All of the questionnaire items are positive. Teachers were expected to indicate their preferences among "always", "usually", "often", "sometimes", "never". The points for options were: "always, 5", "usually, 4", "often, 3", "sometimes, 2", "never, 1". The questionnaire was investigated with factor analysis for construct-related validity and reliability of the questionnaire about internal-consistency was tested with cronbach alpha. Cronbach alpha and factor analysis were tested using the trial form of the questionnaire. Cronbach alpha was found as 0.8819, Kaiser Meyer Olkin (KMO) measure is 0.827, Bartlett test is 1188.515. Factor analysis was administered to test the validity about construct relation of the questionnaire. The test revealed that the items in the questionnaire were valid. The factor load values of all items are between 0.80 and 0.45. According to Tabachnick and Fidel (2001) the items' value of a variable load should be above 0.32. Comrey and Lee (1992) suggested that the value of a variable load (Büyüköztürk, Çokluk, Şekercioğlu, 2010): a) 0.71 (which describes 50%) "perfect", b) 0.63 (which describes 40%) "very good", c) 0.55 (which describes 30%) "good", d) 0.45 (which describes 20%) "average", e) 0.32 (which describes 10%) "weak". Thus, we assumed that items in the questionnaire were between average and perfect. The result of the factor analysis about questionnaire KMO measure (was 0,827, the result of Bartlett test was found to be 1185. 515 and 0.000 level which was meaningful. As to the result of the factor analysis, Learner control strategy questionnaire was divided into seven subscales and consisting of totally twenty eight questions were used for data collection. The result of the KMO test was 0.827(0.82).

According to KMO statistics 0.50 to 0.70 meant mid level, 0.80 to 0.90 meant very good and 0.90 and above meant excellent (Field, 2002). The result of the learner control strategy questionnaire's KMO test can be evaluated very good level according to this classification. Table 1 displays the result of the factor analysis. As shown in the table, factors of the items defined as theoretical are collected in a particular category. According to these results, the questionnaire includes 7 sub-scales: 1) Option of the usage suitable strategy and skill (control of the strategy and skill), 2) option of the exercise (control of the speed and period about learning of the information), 3) option of decision-making (control of decision), 4) option of the content (control of the content), 5) option of the control of the topic's information and quantity, 6) responsible for his or her own learning and 7) opportunity of determining learning strategies.

These 7 sub-scales are called learner control options. The questionnaire was English teachers (9%), 16 Mathematics teachers (7%), 15 Science teachers (8%), 11 Social Sciences teachers (5%), 9 Religion and Morals teachers (4%), 5 Computer and Technology teachers (2%) participated in this research. The percentages show that the most populated teacher group was that of class teachers, while the least populated group was that of Computer and Technology teachers. The length of service of 22 teachers ranged from 1 to 5 years (10%), 28 teachers from 6 to ten years (13%), 27 teachers from 11 to 15 years (12%), 42 teachers from 16 to 20 years (20%), 41 teachers from 21 to 25 years (19%), 29 teachers from 26 to 30 years (13%), 26 teachers from 31 to 35 (11%), 4 teachers 36 years and above (2%). The group whose length of service ranged from 16 to 20 years was the most populated teacher group in this research. The work experience of the second most populated teacher group was between 21 and 25 years. The third most populated teacher group had a work experience range of 26 to 30 years, while the least populated teacher group had a work experience range of 36 years and above.

Development of the data collection tool

The development of the usage learner control strategy questionnaire about the teachers study in the state primary schools were achieved in several steps. In the first, the related literature about research was reviewed. In the development of each of the items, totally 28, we referred the ideas of the experts working on the issues. Specialists' views and opinions were positive about the questionnaire's items for content-related validity. At the beginning of the questionnaire (scale), the survey describes how to respond to information about the scale that make it easy and straight forward the questionnaire (scale). The purpose of the scale included information such as number of items. The items were visually distinguishable from each other (Atilgan, 2006). The questionnaire was developed by the researcher as 5 point likert scale and applied in Turkish language to the teachers. It was administered to 60 randomly selected teachers for pre-trial (pilot study). As a result of the pre-trial study, it was noticed that the items of the data collection tool was comprehended well, however very few items required the expression changing. The items required the developed and applied in Turkish language to the teachers by the researcher. Data which were concerned about development of the questionnaire were investigated by factor analysis consisted of KMO and Bartlett test was used for the validity of the questionnaire. Cronbach alpha was used for the reliability to check the internal consistency of items in the questionnaire of the questionnaire's internal consistency. Table 2 displays the items of the scale created by the end of the study.

Table 1. Result of the factor analysis.

	Learner control strategy questionnaire factor analysis						
	1	2	3	4	5	6	7
127	0.739	0.092	0.143	0.133	0.149	-0.122	0.323
128	0.736	0.325	0.271	0.101	0.100	0.222	0.072
119	0.664	0.303	0.064	0.331	0.175	0.232	0.161
125	0.645	0.218	0.311	0.047	0.328	0.285	0.116
115	0.603	0.071	0.441	0.074	-0.289	0.074	-0.234
126	0.509	0.162	0.079	0.412	0.172	0.412	-0.124
111	0.011	0.731	0.193	0.269	0.183	-0.010	0.173
11	0.222	0.711	0.080	-0.063	-0.037	0.115	0.183
112	0.199	0.645	0.182	0.082	0.094	0.300	-0.183
12	0.158	0.608	0.170	0.227	0.179	-0.174	-0.056
113	0.231	0.554	0.016	0.368	0.266	0.203	0.058
110	0.110	0.455	0.343	0.176	-0.137	-0.124	0.319
14	0.036	0.113	0.789	-0.004	0.040	0.041	0.054
15	0.222	0.071	0.682	0.307	0.088	0.119	-0.021
17	0.051	0.119	0.645	0.252	0.167	0.101	0.403
13	0.185	0.316	0.561	-0.167	-0.061	0.170	0.155
16	0.233	0.260	0.555	0.186	0.058	0.085	-0.133
120	0.133	-0.132	0.478	0.303	0.333	0.403	0.350
18	0.248	0.195	0.199	0.698	0.208	-0.002	0.008
19	-0.047	0.313	0.191	0.671	-0.007	0.348	-0.063
116	0.150	0.011	0.124	0.553	-0.369	-0.048	0.035
118	0.438	0.146	-0.111	0.478	0.224	0.106	0.158
121	0.205	0.136	0.170	0.120	0.802	0.006	0.065
122	0.254	0.364	0.044	-0.039	0.571	0.171	0.136
123	0.078	0.021	0.133	0.069	-0.128	0.762	0.251
117	0.232	0.117	0.148	0.101	0.279	0.672	-0.035
124	0.230	0.147	0.051	-0.118	0.281	0.209	0.609
114	0.139	0.188	0.245	0.382	-0.333	0.169	0.448

The subcategories of the questionnaire ranged from 1 to seven and the factor loads of the questionnaire items according to their subcategories ranged from 1 to 28.

Table 2. Learner control strategy questionnaire's items.

Items of the questionnaire
1. I ask my students to express their views and opinions on my teaching methods.
2. I ask my students to express their views and opinions on the speed of my lesson presentation.
3. I ask my students to express their views and opinions on whether they need prerequisites of the lesson.
4. I ask my students to express their views and opinions on whether they need giving examples.
5. I ask my students to express their views and opinions on whether they need more exercises.
6. I ask my students to express their views opinions on whether they a summary of the lesson.
7. I ask my students to express their views and opinions on whether they need any repetition during my presentation.
8. More than half of my students know and use the strategies they need.
9. My students have background knowledge necessary for the lesson.
10. I ask my students to express what they mean
11. My students can work on exercises they like
12. My students can work on as many exercises as want.
13. My students can express their views on how long the lesson should last.
14. My students know what to learn during the lesson.

Table 2. Contd.

-
15. My students, apart from me, get help from guidance counselor, advisor and/ or other teachers.
 16. In addition to the course books, my students can access the other learning sources such as the books in library, software, internet and etc.
 17. My students can afford lesson materials.
 18. My students can decide on due time to submit their performance and projects assignments.
 19. My students can think over how they should study when they want to learn a topic.
 20. My students are aware that they are responsible for their own learning.
 21. My students can decide on what course they should take.
 22. My students can choose what topic, unit or part of unit they want to study.
 23. My students can ask what they do not understand during the lesson.
 24. I respect my students' decisions (thoughts).
 25. My students can try out different ways in learning a new topic.
 26. More than half of my students have critical study skills.
 27. How to learn is important to my students.
 28. My students can decide on how to learn during the lesson.
-

CONCLUSION AND DISCUSSION

The purpose of this study is to develop a likert type scale in order to measure teachers' using level of learner control strategy which is one of the strategies of Elaboration Theory. According to Factor analysis, KMO measure was found to be 0.827 and the Bartlett test is 1185.515. These results displayed that the items were valid with the load factors between 0.80 and 0.45. This meant items were very good and average level in the 5-point Likert-type scale was created and developed consisting of 28 items. Renewing the studies, researches and the comparisons of the researches and studies where the learning and teaching environment do not cover the teachers and the learners are important in this field. The researches and studies in different areas and different groups are required with taking into consideration the learners and teachers. It is seen that the research and studies are more abundant in computer assisted instruction or computer mediated instruction. However, learner control is an important strategy because it provides the control of students in a learning environment, which can be used in all kinds of learner-centered approach and allows the learner to take the responsibility for their own learning and at the same time control it. The research and studies about learner control strategy are made and evaluation in a classroom environment will contribute the studies and the researches more significant and preferable for teachers and learning-teaching environments.

REFERENCES

- Atilgan H (2006). *Egitimde degerlendirme*. Ankara: Ani.
- Baynton M (1989). *Control of the learning process in distance learning*. Phd dissertation, University of Calgary, Calgary, Alberta.
- Bell BS, Kozlowski SW (2002). *Adaptive guidance: Enhancing self-regulation, knowledge and performance in technology based training*. *Personnel Psychol.*, 55(2): 267-307.
- Büyüköztürk Ş, Çokluk, Ö, Şekercioğlu G (2010). *Multivariate statistics for social sciences spss and lisrel applications*. Ankara: Pegem Akademi.
- Comrey AL, Lee HB (1992). *A first course in factor analysis*. (2nd ed). New Jersey: Lawrence Erlbaum Associates.
- Cook KA (2001). *Learner control and user-interface interactions in CMC courses*. PhD dissertation, The University of Toronto, Toronto.
- Deryakulu D (2000). *Democracy in class: Constructivist learning*, Ankara: Eğitim Sen, pp 53-77.
- Field A (2002). *Discovering statistics using SPSS*. London: Sage.
- Gage N, Berliner DC (1988). *Educational psychology*. Boston: Houghton Mifflin Company.
- Jonassen DH (1994). *Toward a constructivist design model*. *Educ. Technol.*, 31(6): 35-37.
- Klein JD, Keller JM (1990). *Influence of student ability, locus of control, and type of instructional control on performance and confidence*. *J. Educ. Res.*, 8(3): 140-46.
- Kinzie MB, Sullivan HJ, Berdel RL (1988). *Learner control and achievement in science computer assisted instruction*. *J. Educ. Psychol.*, 80: 299-303.
- López CL, Harper M (1989). *The relationship between learner control of CAI and locus of control among hispanic Students*. *Educ. Technol. Res. Dev.*, 37(4): 19-28.
- Lunts E (2002). *What does the literature say about the effectiveness of learner control in computer-assisted instruction?* *Elect. J. Integration Technol. Educ.*, 1(2): 59-75.
- Merrill MD (1984). *What is learner control?*. In R. K Bass, C. R. Dills (Eds.), *Instructional development the state of art II* (pp. 221-242). Dubuque, LA: Kendall/Hunt.
- Miller ML (1996). *Adaptive learner control provides a more efficient framework for education*. PhD dissertation, Toronto University, Toronto.
- Morrison JT (2004). *Reducing the cognitive load presented by definition presentation in electronic learning environments through the use of hypermedia rollovers*. PhD dissertation, The University of Central Florida, United States, Florida.
- Perez GC, Kester L, Van MJGJ (2010). *Adaptation of education and learner control: A model for personalized task selection*, *web: http://www.iwm-kmrc.de/workshops/sim2004/pdf_files/Corbalan_et_al.pdf*. (Date: 14.01.2010).
- Polizzi JV (2008). *The effects of supervisory support, age and gender on self efficacy and metacognitive activity in a learner controlled training environment*. PhD dissertation. Touro University International, California.

- Reigeluth CM, Stein R (1983). Elaboration theory: instructional-design theories and models: An overview of their current status. In CM Reigeluth (Ed.), Hillsdale New Jersey: Erlbaum.
- Reigeluth CM (1979). In search of a better way to organize instruction: The elaboration theory. *J. Instruct. Dev.*, 2(3): 8-15.
- Reigeluth CM (Ed.) (1983). *Instructional-design theories and models: an overview of their current status.* Hillsdale, New Jersey: Erlbaum Associates.
- Reigeluth CM (1987). Lesson blueprints based on the elaboration theory of instruction. In C.M.Reigeluth (Ed.), *Instructional theories in action: Lessons illustrating selected theories and models* (). New Jersey: Lawrence Erlbaum Associates, pp. 245-288.
- Tabachnick BG, Fidel LS (2001). *Using multivariate statistics* (4th Ed.). MA: Allyn and Bacon, Inc.
- Saban A (2005). *Process of teaching-learning*, Ankara: Nobel
- Santiago R, Okey J (1992). The effects of advisement and locus of control on achievement in learner-controlled instruction. *J. Computer-Based Instruct.*, 119(2): 47-53.
- Steinberg ER (1977). Review of student control in computer assisted instruction. *J. Computer-Based Instruct.*, 3(3): 84-90.
- Steinberg ER (1989). Cognition and learner control: A literature review, 1977-1988. *J. Computer-Based Instruct.*, 6(4): 117-121.
- Williams MD (1996). Learner-control and instructional technologies. In D. Jonassen (Ed.), *Handbook of research for educational communications and technology* (2nd ed.) New Jersey: Lawrence Erlbaum Associates.
- Yang YC (1991). *The effects of self-regulatory skills and type of instructional control on learning from computer-based instruction.* PhD dissertation, Florida State University, Tallahassee, Florida.
- Yao Y (2006). *The effect of different presentation on formats of hypertext annotations on cognitive load, learning and learner control.* PhD dissertation. The University of Central Florida, Orlando, Florida.