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Possibilities of Developing Study Motivation in E-Learning Products

A. Dumčienė, D. Lapėnienė

Department of Social Sciences and Humanities, Lithuanian Academy of Physical Education,
Sporto 6, LT-44221, Kaunas, Lithuania, phone: +370 37 209050, e–mail: a.dumciene@lkka.lt

Introduction

The aim of the paper is to assess the quality of e-learning products developed in colleges for mixed learning in terms of informational and pedagogical technologies, value attitudes and learning motivation development.

The novelty of the paper lies in the fact that by applying the same methods, experts and students (i.e. users of the products) evaluated the researched learning products.

There is no uniform opinion on the concept of the quality of e-learning courses and on the list of quality assessment criteria within the pedagogical community [1]. It is commonly indicated that optimization of quality assessment is essential. The research showed that many quality strategies and concepts are available in Europe, which is justified by the necessity of creating a quality strategy for every context. According to the majority of respondents, learners are to feature the key role when assessing the quality of e-learning. The data of the present research shows that the quality of the courses was evaluated as 'high' by the majority (77%) of the providers of the relevant courses; however, only a minor part of the users (learners) produced high evaluation. Essentially, quality may be ensured by three fundamental groups of methods: quality management, quality testing and quality evaluation. However, there are no universally acknowledged methods of quality management available, only the concept is being rapidly developed. That is why quality testing may be performed according to a list of fixed criteria even though the validity of certain suggested criteria has not been proven yet [1].

Despite suggestions having been given previously (as mentioned above) for a uniform system of criteria and standardization of quality assessment, other criteria systems for quality assessment are being created with the emphasis on more extensive involvement of the learners (i.e. product consumers).

It is believed that properly developed e-learning devices may aid the implementation of constructivist learning with the emphasis on the learner and his/ her needs [2].

In the context of the paradigm of constructivist learning, apart from the content and technology, the process and its participants are the other two important factors, and they are even foregrounded as the essential dimensions in the process of quality evaluation [3]. Various methodologies of evaluation employ different numbers of criteria divided into particular groups. Among the criteria presented in [4], 123 positions divided into 11 groups are available; however, only 10 criteria are attributed to the group of quality assessment. The multi-level system MECA-QDL containing 140 criteria divided into 7 groups was suggested for the use in quality assessment [5]. A list of advisable criteria of quality assessment criteria was suggested [6] together with the aspects of their selection when taking into consideration the pedagogical methods [7]. Opportunities of applying universal quality measurement standards for e-learning product quality are also explored [8]. When assessing the quality of e-courses from the holistic point of view, 10 groups of criteria are used [9].

When assessing the quality of e-courses from the holistic point of view, 10 groups of criteria are singled out: Material/content; Structure/virtual environment; Communication, cooperation and interactivity; Student assessment; Flexibility and adaptability; Support (student and staff); Staff qualifications and experience; Vision and institutional leadership; Resource allocation; The holistic and process aspect [10].

In the research [11], a system of 42 criteria divided into 6 groups for the assessment of e-learning products is proposed. The validity of the suggested questionnaire was also verified. Students were involved into the evaluation of the evaluation of e-learning products. However, this system covers only a part of the aspects of quality.

Even though a standardized system of e-learning course quality evaluation was offered with a discussion of its application in practice [1, 3, 6, 7, 8], researches of possibilities of evaluation are still continuing as evidently shown by the headlines of publications.

Methods

Assessment of e-learning product quality was performed covering two dimensions: 1. Information-pedagogy technologies; within which, eight groups of criteria reflecting the systematic attitude to the learning issue: the properly prepared information on the course adhering to the needs of the learner (notably, the objectives and the "learner guide"); logical and consistent structure of educational material presentation; application of virtual environments in e-learning; supply of self-assessment assignments; design elements; forms of intermediate assessment; grounding for the assessment methodology of the acquired competences, together with the criterion of the promotion of value attitude development, which is based on axiological approaches. From the axiological point of view (i.e. corresponding to one of the criteria groups), elements of the interactivity of e-learning courses which were oriented towards the development of emotional objectives were assessed. That is why in e-learning products, those structural elements which ensure the interactivity of the course were dealt with in order to systematically seek the implementation of objectives related with the emotional objectives of acquisition, feedback, assessment and process management [12]. The expert evaluation questionnaire contained 87 statements. 2. In terms of the aspect of the learner motivation development, *ACRS Model* by J. M. Keller was applied to provide evaluation of 36 statements in *Likert scale* [13].

E-learning products of the course "Information technologies" were evaluated; they were developed by four lecturers and were being used in colleges in the mixed learning system; the e-learning products dealt with the theoretical part of the course, practices in computerized classrooms with the participation of a lecturer, group and individual consultations.

Ten lecturers of higher education institutions and colleges possessing extensive experience in the development of e-learning products were invited as experts (prof. S. Daukilas was the leader of the expert group). Students-users of the e-learning products were the assessors practitioners, and their participation in the evaluation was completely voluntary. They were distributed 130 copies of the questionnaires of both types with the statements which were filled in with the researchers participating. In total, 122 questionnaires were fully filled in and suitable for the analysis. Data procession was performed by using the statistical package for data processing, *SPSS 13.0 for Windows*, and the statistical significance level for the verification of hypotheses was selected at $p<0.05$. The verification of data distribution was performed by applying Kolmogorov-Smirnov criteria. As the distribution of the research data differed from the regular distribution, the average difference statistical significance was verified by applying *chi square criterion*.

Research results

Evaluations by experts and students regarding technology and value aspects (averages of the marks given to the evaluated products) are presented in Fig. 1 and Fig. 2 correspondingly:

The three highest evaluations of the experts were (decreasingly): the appropriateness of the evaluation forms of the acquired competences; the fulfillment of learning assignment (issue) solution from the systematic point of view and the logical structuration of the learning material.

However, students presented different levels of evaluation; among them, the three highest-ranking positions were: the value aspect of the course content in terms of interactivity (appropriateness, quality) when implementing emotional (affective) objectives of education as expressed in the form of affective targets in the study process; the grounds for the methodology of the wholeness of evaluation (including the value aspect of expression) of the acquired competences and the appropriateness of the evaluation forms of the acquired competences.
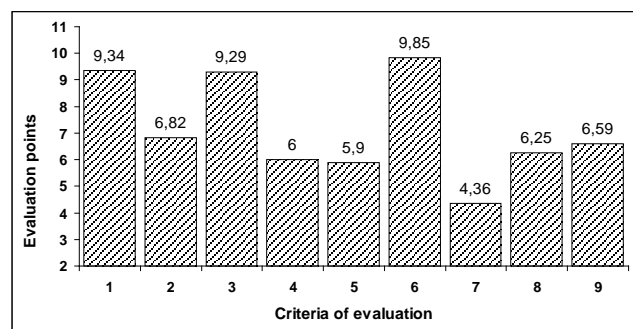

Fig. 1. Expert marks on the quality of e-learning products

Here, "1" stands for the fulfillment of learning assignment (issue) solution from the systematic point of view; "2" means the quality of the development of self-assessment assignments; "3" signifies the logical structuration of the learning material; "4" represents the general appropriateness of the e-course interface design elements; "5" stands for the completeness and understandability of the information on the course; "6" is the appropriateness of the evaluation forms of the acquired competences; "7" denotes the appropriateness and suitability of the media employed in the course; "8" denotes the value aspect of the course content in terms of interactivity (appropriateness, quality) when implementing emotional (affective) objectives of education as expressed in the form of affective targets in the study process; "9" represents the grounds for the methodology of the wholeness of evaluation (including the value aspect of expression) of the acquired competences.
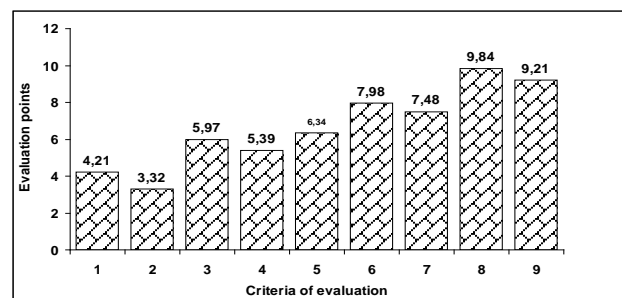

Fig. 2. Student marks on the quality of e-learning products

Thus only according to one criterion, the appropriateness of the evaluation forms of the acquired

competences, the opinions of the experts and the students partially coincided as only the evaluations of this criterion ranked among the three highest-assessed criteria even though the marks differed by 1.87 points. The most prominent differences in opinions may be singled out in the following criteria: the fulfillment of learning assignment (issue) solution from the systematic point of view; the value aspect of the course content in terms of interactivity (appropriateness, quality) when implementing emotional (affective) objectives of education as expressed in the form of affective targets in the study process and the quality of the development of self-assessment assignments. The lowest marks were given by students to the following criteria: the quality of the development of self-assessment assignments; the fulfillment of learning assignment (issue) solution from the systematic point of view and the general appropriateness of the e-course interface design elements.

According to the data of the research, the marks of the expert and learner evaluation (Fig. 1 and Fig. 2) were statistically significantly different (χ^2 (8) = 15.68, p<0.05). The most serious drawback of the evaluated e-learning products was that students gave only 3.32 points to the quality of the development of self-assessment assignments. In terms of the aspect of motivation development in e-learning products provided by the experts and students, the results are presented in Table 1 to Table 4.

Table 1. The distribution of expert and student evaluation regarding the aspect of attention concentration

Scale	Experts, n = 10	Students, n = 122
Excellent	20.0 %	10.7 %
Very good	40.0 %	63.9 %
Good	40.0 %	18.0 %
Fair	0 %	7.4 %
Poor	0 %	0 %

* The averages differ significantly (χ^2 (4) = 23.51, p<0.05).

E-learning products were assessed more positively by the students rather than by the experts. The majority of the students (74.6%) evaluated attention concentration when employing the presently explored learning devices as excellent or very good while nine individuals only gave the evaluation "average". In terms of the relevance of these learning devices, the opinions of the experts and the students differed statistically significantly (p<0.05).

Evaluations by the experts and the students regarding the aspect of attention concentration differed statistically significantly (p>0.05).

Table 2. The distribution of expert and student evaluation regarding the aspect of relevance

Scale	Experts, n = 10	Students, n = 122
Excellent	20.0 %	10.7 %
Very good	50.0 %	42.6 %
Good	20.0 %	36.1 %
Fair	10 %	7.4 %
Poor	0 %	3.3 %

* The averages differ significantly (χ^2 (4) = 17.56, p<0.05)

In terms of the relevance of these learning devices, the opinions of the experts and the students differed statistically significantly (p<0.05). While 70% of the experts produced the marks "excellent" or "very good", the

same level was noted only by 53.3% of the students, and 3.3% of the students marked it as "poor".

Table 3. The distribution of expert and student evaluation regarding the aspect of confidence

Scale	Experts, n = 10	Students, n = 122
Excellent	60.0 %	50.0 %
Very good	30.0 %	42.6 %
Good	10.0 %	36.1 %
Fair	0 %	0 %
Poor	0 %	0 %

* The averages differ significantly (χ^2 (4) = 6.67, p>0.05).

In terms of the aspect of confidence, the evaluations of the experts and the students did not differ statistically significantly (p>0.05); in terms of percentage values, "good" (or superior marks) were produced by four times as many students as lecturers.

Table 4. The distribution of expert and student evaluation regarding the aspect of satisfaction

Scale	Experts, n = 10	Students, n = 122
Excellent	30.0 %	32.0 %
Very good	50.0 %	42.6 %
Good	20.0 %	18.0 %
Fair	0 %	4.1 %
Poor	0 %	3.3 %

* The averages differ significantly (χ^2 (4) = 8.99, p>0.05).

In terms of satisfaction, the opinions of the experts and the students virtually coincided (p>0.05). Still, five students (4.1%) marked it as "fair" and four (3.3%) even as "poor".

The students believe that when using e-learning products, attention is concentrated well; the relevance of the product material is high, and when using this type of materials in their studies, students trust it and experience satisfaction with the achieved results. However, the students showed that they were not satisfied with the level of the preparation of self-assessment assignments and the fulfillment of learning assignment (issue) solution from the systematic point of view as well as with the general appropriateness of the e-course interface design elements.

Conclusions

1. When developing new e-learning products, they must be maximally endowed with the attitudes which received the lowest evaluations from the students: the fulfillment of learning assignment (issue) solution from the systematic point of view, the quality of the development of self-assessment assignments and the general appropriateness of the e-course interface design elements.
2. In terms of many aspects (criteria) of the evaluated e-learning products, the evaluations of experts and students differed significantly (p<0.05). Only regarding the criteria of confidence and satisfaction, the opinions did not differ (p>0.05).
3. E-learning products do not sufficiently use the educational opportunities of learning motivation; product developers must address this issue.

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A. Dumčienė, D. Lapėnienė. Possibilities of Developing Study Motivation in E-Learning Products // Electronics and Electrical Engineering. – Kaunas: Technologija, 2010. – No. 6(102). – P. 43–46.

The aim of the paper is to assess the quality of e-learning products developed in colleges for mixed learning in terms of value attitudes and learning motivation development. Regarding the aspect of value development, nine groups of criteria were employed while ARCS Model by J.M.Keller was used for the assessment of educational opportunities. 10 experts and 122 students provided the evaluations. In terms of eleven criteria, the average evaluations of the experts and the students differed statistically significantly ($p<0.05$) while opinions did not differ regarding the criteria of confidence and satisfaction ($p>0.05$). Ill. 2, bibl. 13, tabl. 4 (in English; abstracts in English, Russian and Lithuanian).

А. Думчене, Д. Лапениене. Развитие ценностных установок и мотивации в продуктах э-обучения // Электроника и электротехника. – Каунас: Технология, 2010. – № 6(102). – С. 43–46.

Представлены результаты оценки продуктов э-обучения в аспектах развития ценностных установок и мотивации. Оценка проводилась по тринадцати группам критериев. Разница в оценках экспертов и студентов по 11 критериям статистически значимо ($p<0.05$). По критериям значимости и удовлетворенности мнения не различилась ($p>0.05$). Оценка позволяет сблизить отношения преподователей подготавливащих продукты э-обучения, и пользователей – студентов и это позволяет улучшить качество. Ил. 2, библ. 13, табл. 4 (на английском языке; рефераты на английском, русском и литовском яз.).

A. Dumčienė, D. Lapėnienė. Mokymosi motyvacijos ugdymo e.mokymosi produktuose galimybės // Elektronika ir elektrotechnika. – Kaunas: Technologija, 2010. – Nr. 6(102). – P. 43–46.

Darbo tikslas – įvertinti kolegijose mišriam mokymuisi parengtų e-mokymosi kursų kokybę vertybinių nuostatų bei mokymosi motyvacijos ugdymo požiūriais. Vertybių ugdymo požiūriu vertinimui naudotos devynios kriterijų grupės, o motyvacijos ugdymo galimybėms vertinti naudotas J. M. Kellerio ARCS modelis. Vertino 10 ekspertų ir 122 studentai. Pagal 11 kriterijų grupių ekspertų ir studentų įverčių vidutinės reikšmės skyrėsi statistiškai reikšmingai ($p<0.05$). Pagal pasikliovimo ir pasitenkinimo kriterijus nuomonės nesiskyrė ($p>0.05$). Il. 2, bibl. 13, lent. 4 (anglų kalba; santraukos anglų, rusų ir lietuvių k.).