

ICT Usage and E-Courses Development by Faculty Staff in Healthcare Majors at Medical University – Plovdiv

Angelina Kirkova-Bogdanova¹, Daniela Taneva²

¹*Department of Medical Informatics, Biostatistics and E-learning, Faculty of Public Health, Medical University – Plovdiv, 15A Vasil Aprilov Blvd., 4002 Plovdiv, Bulgaria*

²*Department of Nursing Care, Faculty of Public Health, Medical University – Plovdiv, 15A Vasil Aprilov Blvd., 4002 Plovdiv, Bulgaria*

Abstract - The aims of this study were to investigate the extent and benefits of ICT usage; barriers to learning content management systems (LCMS) deployment; perception and attitude to e-learning of the academic staff in the healthcare majors at the Medical University – Plovdiv. The results indicated that the educators use technologies extensively, they are experienced with computers but this is not a predisposition for teaching in the LCMS. Staff demonstrates acceptance of e-learning and critical attitude to its implementation, but the activity in the LCMS is low. Leading barriers in e-course creation are the heavy workload and the need for support in creating interactive learning content. A training course framework is proposed.

Keywords - higher education, healthcare, e-learning, faculty staff, LCMS

1. Introduction

In recent decades, we are witnessing rapid and radical changes in all aspects of human lives, emerging from the development of information and communication technologies (ICT).

DOI: 10.18421/TEM92-41

<https://doi.org/10.18421/TEM92-41>

Corresponding author: Angelina Kirkova-Bogdanova, Department of Medical Informatics, Biostatistics and E-learning, Faculty of Public Health, Medical University – Plovdiv, 15A Vasil Aprilov Blvd., 4002 Plovdiv, Bulgaria.

Email: angelina.kirkova@abv.bg

Received: 20 March 2020.

Revised: 04 May 2020.

Accepted: 09 May 2020.

Published: 27 May 2020.

 © 2020 Angelina Kirkova-Bogdanova & Daniela Taneva; published by UIKTEN. This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 License.

The article is published with Open Access at www.temjournal.com

Educational systems are under pressure to evolve in order to stay adequate to the changing society. A new generation, our students, has grown up with cognitive, emotional and psychomotor abilities influenced by gaming and social networking [1]. They take technologies as granted in their lives and expect them to be a part of their learning as well. Higher education sector has to keep abreast with technology to respond to the changing demand by provision of an ideal learning environment [2]. The use of the internet for educational purposes should become commonplace in all universities [3].

Formation of future healthcare specialists encompasses technology-related activities – long-life learning readiness, professional use of ICT, and practicing evidence-based health care. Faculty has to be able to design, develop and evaluate learning experiences based on new technologies [4] and engage students through instructional strategies and activities of value to learners [5].

Implementation of e-learning in healthcare educational institutions increases in the last decade. A number of systematic reviews provide adequate evidence that e-learning is an effective educational method in healthcare training [6]. E-learning has the potential to facilitate the cooperation between clinical and classroom settings [7], the continuity of teaching and learning, a better work-study-life balance, as well as knowledge transfer [8].

Arising issues in the process of e-learning development in healthcare are different: psychological matters as attitudes and perception; matters related to andragogy as teaching and learning theories and models; technical problems dealing with building an e-learning infrastructure. Within this multifactorial educational environment, academic staff plays the leading role in the adoption and effective exploitation of any form of a computer-supported training process. E-learning in healthcare education is complex with its four major components – students, educators, patients, and technological infrastructure. Among them, educators are perceived

to be the main factor that contributes to the success of the learning process. Stakeholders have to comprehend faculty members' fears, preferences and level of readiness for technology acceptance in class as attributes of effective technology-enhanced teaching [9]. Many universities deploy learning content management systems (LCMS) to enhance learning content provision, students' competences assessment, and communication within the course. While a LCMS has the potential to facilitate the educational process, reports indicate that faculty teachers are reluctant in the adoption of LCMSs and their effective incorporation in education [10], [11]. Although web-based learning in healthcare is growing and LCMS are available to faculty in many higher education institutions, their use is still limited and not all faculty members take advantage of the tools the systems offer to facilitate their face-to-face classes [12]. A controversial situation has arisen. It is a situation of a proliferation of technologies for training, evidence that e-courses enhance teaching and learning, and limited, unsophisticated and ineffective use of online training through a LCMS.

Academic educators' attitudes, motives, and restraint in e-learning acceptance have been studied by many authors. A few significant factors influencing LCMS adoption emerge from the literature review. A key factor for staff acceptance and integration of ICT in the classroom is the perceived usefulness [2], [12]. This is understandable because the quality of education and achieving learning outcomes are leading for the experienced academic staff. According to Al-alak and Alnawas, experience and computer knowledge are the strongest predictors for behavioural intentions to adopt an e-learning system in class [2]. Gautreau also underlines that the level of technology experience influences faculty members' decision to adopt an LMS in their instructional practices [10]. Surry et al. [13] conclude that teachers do not integrate technology in their classes because of their lack of skills to do so effectively. Computer skills might be a necessary, but not sufficient condition. Koch claims that an important distinction should be made between being able to utilize technology in teaching and competency for teaching in a virtual environment [6]. Effective online teaching requires the integration of new kinds of knowledge – in technology and pedagogy [14]. According to Noval et al. having adopted andragogy appears to motivate faculty to use LMSs beyond the basic tools in allied health professions [12]. Webb et al. highlighted that health professional educators require more ICT training and support to facilitate greater adoption and better integration of ICT in health professional educational settings [15]. The need for support is another hindrance. Trainings, preferably formal certification

training programs for teaching online, based on instructional design [16], and they are supposed to provide teachers with the ability to integrate online courses in the conventional face-to-face majors, but e-learning creation is a multidisciplinary endeavor. E-learning is a team project. A collaborative, team-based approach to e-learning development is considered as a way of facilitating sustainable, responsive and multidisciplinary developments in the constantly changing field of healthcare training [17]. Moreover, technology changes so rapidly that it can be difficult to keep up with the progress [14]. Faculty development and support structures are necessary for the success of blended learning, and this should be underpinned in the institutional policy [18]. Other studies disclose lack of time, limited resources and need for technical support as barriers to the introduction of innovations in healthcare education [9]. The lack of time made available for staff to develop e-learning resources, in addition to the lack of acknowledgement from supervisors is grossly underestimated [19]. Limited access of teachers to office equipment has a negative impact on the implementation of the e-learning [20]. Sackstein et al. argue that contextual issues related to the country's level of economic development should be taken into account when introducing LCMS because problems that may prevent use are different than in the developed world [21].

Barriers exist for educators to use LCMS and create e-learning. There are many of them, and they are complex and deserve proper attention. The faculty staff is a driving force in the transition from computer-aided teaching to student-oriented e-learning and their level of usage of ICT, perceived benefits and barriers to the development of e-courses in healthcare have to be studied and carefully considered. The research questions we posed were: What and how intensely ICTs are used by the faculty members? Is ICT usage a prerequisite for developing e-courses in the LCMS? What prevents teachers from creating e-courses in the LCMS? What is the faculty's attitude to e-learning in healthcare majors? We hoped to find answers that would help plan measures to promote e-learning and encourage e-courses creation for effective implementation of blended learning in healthcare education at the Medical University –Plovdiv.

1.1. Objectives

The aims were to investigate the extent of ICT usage; acceptance of electronic forms of training in healthcare expressed by benefits of technologies and barriers to LCMS deployment; perception and attitude to e-learning of the academic staff teaching in the healthcare majors at the Medical University – Plovdiv.

2. Methods

2.1. Design

This is an anonymous cross-sectional survey conducted through a self-reported questionnaire [22].

2.2. Settings

The study took place in 2017 at the Faculty of Public Health and the Medical College at the Medical University – Plovdiv. LCMS has been in use since 2011. Facilitating learning and teaching with e-courses is optional. LCMS usage is not imposed by the university administration. ICT supported learning and e-courses in a LCMS serve as supplements to the traditional legal face-to-face form of training, as it is in many other European schools [23]. Trainings for online teaching in the LCMSs have been organized for the faculty staff.

2.3. Sample Size

The studied population was 117 faculty members teaching in the ten healthcare majors. The estimated sample size was 90 participants at a confidence level of 95% and confidence interval (margin of error) 5% [24]. All faculty members were invited to take part in the study, 93 of them returned their questionnaires, which satisfied the sample size requirements.

2.4. Survey Instrument

A questionnaire was developed to gather data about the state of the art of ICT usage and attitudes to e-learning among the academic staff. It contained a section about demographic and occupational factors – age, gender, length of service as educators in healthcare majors and questions about the investigated variables:

- Frequency of computer use for different purposes rated on five-point Likert scales from 1 for *never* to 5 for *regularly*;
- Technologies used, pointed by multiple-choice indicators;
- Benefits of applying technology to work expressed through multiple-choice indicators;
- Barriers to the creation of e-courses, given by multiple choice indicators;

- Attitude to e-learning implementation, agreement with statements reported on five-point Likert scales: 1 stands for *strongly disagree* to 5, interpreted as *strongly agree*.

Each question had a field for optional comment.

2.5. Validity and Reliability

The section in the questionnaire we developed for investigating educators' attitude to e-learning initially contained twelve statements. As it was developed especially for this study, we tested its reliability before the analysis of the results. The Cronbach's Alpha was estimated at $\alpha=0.400$, which was considered low. We removed four items from the questionnaire that would increase Cronbach's Alpha if deleted. The new value was $\alpha=0.672$ with 8 items. We accepted this moderate level of reliability [25]. The low Cronbach Alpha value could possibly be explained with the small number of items in the questionnaire. The analysis of the results was based on the replies to these 8 statements.

2.6. Data Analysis

Interval data with normal distribution were analysed by the parametric methods Independent samples T-test and ANOVA, if homogeneity of variance was completed. Ordinal variables, measured on a Likert scale, were tested by the non-parametric methods of Kruskal-Wallis and Mann-Whitney. Pearson χ^2 test and Fisher's exact test were applied in nominal data investigation. Variables with multiple choice indicators were analyzed as sets of dichotomous variables. A Spearman correlation coefficient r_s was estimated for ordinal data.

We accepted a level of significance $\alpha=0.05$.

Central tendencies are presented by a mean value (M) and a standard deviation (SD). The statistical processing of the data was done with IBM SPSS v.19.

3. Results

Women constituted 77.42% ($n=72$) of the sample. A total of 87 persons indicated their age – from 27 to 76 years old, $M=49.72\pm 9.26$. The length of service was in the range of 1 to 40 years, $M=19.49\pm 9.60$. Both variables were normally distributed. No statistically significant difference was found in age ($p=0.945$) and length of service ($p=0.782$) mean values by genders.

3.1. Technology Usage and Benefits

Table 1 summarizes how often respondents use a computer for various activities.

Table 1. Frequencies of using a computer by the academic staff for different purposes

	n	M±SD
Search for information on the internet	93	4.76±0.68
E-mail	93	4.72±0.81
Creating texts and presentations	92	4.55±0.92
Creating tables, charts, or calculations	93	4.09±1.30
Social networking	90	3.83±1.40
Creation of photos or clips	91	3.35±1.49
Cloud storage	89	3.17±1.56
Games and entertainment	90	2.23±1.34

There were no faculty members, who answered with never to all items. We did not find a statistically significant impact of age, gender or work experience on these activities. We did not find a statistically significant difference in frequencies for educators who have an e-learning course, compared to those who do not teach in LCMS.

Table 2 outlines the frequencies of use of ICT for teaching in the three levels of knowledge and skills gain in healthcare education.

Table 2. Frequency of use of ICT for teaching

	n	M±SD	p
Lectures	54	4,30±1,08	
Practical classes and seminars	85	3,95±1,10	<0.0001
Practice in real settings	50	2,90±1,34	

There was no statistically significant impact of respondents' age and length of service on the use of ICT in class. We found that men (M=3,92±0,95) tend to use ICT statistically significantly more often than women (M=2,54±1,28) in training in real settings (p=0.002). This we explain with the specifics of practical training, which results in a different level of applicability of technologies, combined with a different ratio of men and women teaching in the different majors. We did not find a statistically significant difference in frequencies of using ICTs for teaching between the authors of e-courses and the rest of the sample.

Table 3 presents technologies or electronic resources used by the faculty members.

Table 3. ICT and electronic resources in use for training purposes

Technologies and e-resources used:	Responses		% of cases
	n	%	
Presentations	83	24.27	89.25
Text files	57	16.67	61.29
Images or clips	56	16.37	60.22
Tables and charts	56	16.37	60.22
Electronic communication	27	7.89	29.03
Electronic tests	19	5.56	20.43
Computer simulations	9	2.63	9.68
Total:	342	100.00	-

Two respondents did not check any indicator, no other ICT and e-resources were revealed. Age, gender and length of service do not influence statistically significant educators' choices. The use of e-tests related statistically significantly to the teachers' e-learning experience – p=0.001. The faculties that maintain an e-course on the e-learning platform apply these more often (45.83%) than their colleagues, who do not teach in the LCMS (11.29%).

Table 4 presents the faculty staff's answers about the benefits of technologies to teaching. All participants responded and all statements were pointed.

Table 4. Benefits of technologies to training in healthcare professions

Benefits of technologies for:	Responses		% of cases
	n	%	
Visual presentation of the teaching material	87	20.86	93.54
Opportunity to provide additional resources on the content	67	16.07	72.04
Organization of the teaching process	60	14.39	64.52
Shortening teaching time and spending more time for discourse	57	13.67	61.29
Facilitating communication with students for consultation	44	10.55	47.31
Linking theory to practice	39	9.35	41.94
Responding to the individual educational needs of the students	29	6.95	31.18
Formative assessment	23	5.52	24.73
Summative assessment	11	2.64	11.83
Total:	417	100.00	-

Work experience had a statistically significant impact on the faculty members' opinion on two assets. Staff, who did not point visualization as a benefit, had a longer length of service (M=27.00±11.19 years), than staff, who selected this indicator (M=18.95±11.19 years), p=0.001. Better organization of the working process thanks to technologies was appreciated by faculty with bigger experience (M=20.30±8.69 years), while the average length of service of trainers who did not check this option was M=18.09±10.10 years, p=0.009. The authorship of e-courses influences statistically significant the perception of the feasibility of technology in both formative (p=0.005) and summative (p=0.009) assessment. We did not find a statistically significant difference in the faculty's answers by age and gender.

Two more assets except those suggested in the question were disclosed: "Preliminary introduction to the course material for the upcoming lectures and

practical classes” and “Increases interest in the discipline, students have a higher interest in electronic than in paper information”.

3.2. LCMS Activity and Barriers to e-Courses Development

Despite the reported frequent use of technologies, the relative share of faculty, that maintain an electronic course in the university LCMS was small – 27.91% (n=24) of a total of 86 respondents, who gave valid answers. A statistically significant influence of gender, age or length of service on the e-course authorship was not found.

Potential barriers to the creation of e-courses were studied. Indicators, ranked by frequency, are given in Table 5.

Table 5. Barriers to the creation of electronic courses in LCMS

Barriers to the creation of e-courses:	Responses		% of cases
	n	%	
My heavy workload does not allow me to spend the time necessary to create and maintain an electronic course.	35	18.42	38.46
I need help in creating interactive e-learning content.	35	18.42	38.46
I need training to work with an e-learning platform.	29	15.26	31.87
I do not have a computer and internet at work.	28	14.74	30.77
I worry about copyright protection in the e-course.	19	10.00	20.88
Lack of recognition, either financial or administrative, by the university to create e-learning.	15	7.89	16.48
I do not think I have to change the way I teach.	14	7.37	15.38
I do not believe that e-learning can contribute to improving the quality of education.	6	3.16	7.69
I prefer to publish printed materials that students can buy.	4	2.11	5.13
I cannot work with a computer well enough to maintain an electronic course.	3	1.58	3.85
I do not provide any materials, I dictate to the students.	2	1.05	2.56
Total:	190	100.00	-

Thirteen respondents (13.98%) did not check any indicator. As for comments, some of them have developed courses in the platforms and indicate that they do not have any obstacles to maintain them,

while others do not use the opportunities LCMS provide because the reasons are in themselves; they have not decided to do so. We analyzed the influence of gender, age, and length of service on the choice of each indicator and we did not find statistically significant differences. Using LCMS also does not affect statistically significant the respondents' answers.

3.3. Attitude to e-Learning Implementation

Table 6 presents the faculty staff's attitude to e-learning.

Table 6. Central tendencies of faculty members' agreement to statements about e-learning.

Nº	Statement	n	M±SD,	Mo
1	Effective learning in a LCMS is active learning.	89	4.38±0.91	5
2	The subject I teach can be learnt distantly in an e-course.	88	2.10±1.47	1
3	There are themes in the subject I teach, that can be learnt distantly in an e-course.	88	3.13±1.58	4
4	Blended learning (e-course+face-to-face) is most suitable for the majors I teach in.	88	3.52±1.37	5
5	The university facilitates and encourages the implementation of e-learning.	87	3.43±1.19	4
6	E-learning requires new teaching competencies.	89	3.74±1.02	4
7	Participation in an e-learning team enhances teachers' professional development.	89	4.17±0.91	5
8	The university needs a centre for teachers support in e-learning creation.	88	4.25±0.95	5

No statistically significant differences were found in responses according to gender, age and length of service.

The experience of teaching online in the LCMS shapes the faculty members opinion on statement 2 (p=0.002), statement 3 (p=0.008) and statement 8 (p=0.018). Mean scores of agreement with these statements for staff with and without e-courses are presented in Table 7.

Table 7. Mean scores of agreement with statements about e-learning depending on experience with teaching in a LCMS

Statement	E-course authorship	n	M±SD	p
The subject I teach can be learnt distantly in an e-course.	Faculty with e-course	23	3.00±1.68	0.002
	Faculty without e-course	59	1.85±1.30	
There are themes in the subject I teach, that can be learnt distantly in an e-course.	Faculty with e-course	23	3.96±1.30	0.008
	Faculty without e-course	60	2.97±1.56	
The university needs a centre for teachers support in e-learning creation.	Faculty with e-course	22	4.59±0.91	0.018
	Faculty without e-course	60	4.20±0.88	

4. Discussion

4.1. Technology Usage and Benefits

The academic staff is experienced with computers and networking, which is an important predisposition for integrating technologies in class. The extent of ICT usage depends on the nature of the material being taught (Table 2). The effectiveness of e-learning depends not only upon the domain of the learning objective, but also upon the complexity of the subject matter [8].

According to Fernandez-Aleman et al. [4], younger educators use ICT more readily. Such a trend was not observed in our sample.

Passive resources (Table 3), as well as reasons that facilitate mostly the educator's work (Table 4), were evaluated apparently higher than those that suggest the use of ICT to provide a student-oriented learning process. A significant benefit of implementing modern computer technologies in health education is to make the transition from the classroom to the real hospital environment smoother and less stressful. The link between theory and practice is a major principle of the andragogical process [26]. Technology has a significant contribution to linking theory to practice, but this was recognized by less than half of the respondents (Table 4). Computer simulations, as a modern tool for better preparation for work in real settings, are the least commonly used technologies (Table 3), indicating that many educators do not use or do not have access to technologies that facilitate the theory-practice transition.

4.2. LCMS Activity and Barriers to e-Courses Development

A significant discrepancy was established between the level of usage of technology in traditional training and teaching on an e-learning platform. The healthcare teaching staff has lower activity in the LCMS compared to their colleagues from other countries [4], [9]. The experience with computers and the intensity of technology usage for teaching is not a prerequisite for e-course authorship in our survey.

The academic staff, involved in the training of future healthcare professionals in our survey is remarkably unanimous on each of the reasons for the weak e-course creation activity. Problems are the same for both those faculty members, who use the platforms and those who do not have courses there, which imply that the capabilities of the implemented LCMS are not fully exploited. They are mainly used to publish lecture material in a presentation format or as text files, and less used for the development of interactive study content that students are engaged to work with. Moule et al. also reported that the majority of e-learning was in the form of instruction and did not involve any collaboration [27]. Coble argues that the majority of users employ LMS as “e-Copier”, “e-Publisher” and “e-Projector”. [28]. This is a serious problem for the quality of e-learning courses as e-learning in healthcare majors is perspective provided that it is motivating and engaging.

Lacks of time [19], and need of assistance for educators [9], [20], were reported in the literature as significant hindrances in e-learning adoption by faculty. These are the leading barriers in our survey. Designing and developing quality e-learning is a laborious process that takes more time than the development of a face-to-face lesson. Undoubtedly, the time required to develop e-learning depends on a number of factors. The creation of a conventional lesson concludes with research, collection, writing, structuring, formatting and provision of content. The e-learning development process continues with the adaptation of content in an appropriate electronic format, organizing assets in e-learning units, then importing or programming the units in a LCMS. This process requires competencies other than those in the scientific field of the content expert (the lecturer) and those that are not limited to good computer literacy. The way to overcome the two most serious obstacles – lack of time and skills – is the formation of e-learning development teams, as is the practice in many universities.

A statistically significant moderate correlation ($r_s=0,574$, $p<0,0001$) exists between the insufficient training for working in an e-learning platform and the

need for support the development of interactive electronic educational content, which indicates that teachers feel unprepared for e-learning development. Conducted trainings for work with the LCMS seem insufficient or inadequate. Inadequate training and support on behalf of the institution was reported by Crews et al. [5] as a hamper to learning new technologies. Provision of hands-on training courses may increase the faculty's confidence and thus their activity in the e-learning environments.

Salary and recognition are motivating factors for LMS adoption in teaching [10]. In recent years, the development of electronic learning resources has been recognized in the university. Recognition, however, has no financial dimension. We found a statistically significant weak positive correlation ($r_s=0,318$, $p=0,002$) between indicators "Lack of recognition, either financial or administrative, by the university to create e-learning." and "My heavy workload does not allow me to spend the time necessary to create and maintain an electronic course.". Educators would probably find time to put e-learning development into their busy schedules if they have the assurance that their efforts will be recognized and rewarded. Back et al. also highlight that there is a potential for improvements regarding motivational incentives for the teaching staff, which is dealing with the development and implementation of e-learning scenarios [23].

4.3. Attitude to e-Learning Implementation

It is important to investigate the faculty's attitude to e-learning in healthcare majors to better understand their manner of technology implementation. According to Babic, demographic and situational variables are important for e-learning acceptance. The author points out that there are studies that reveal statistically significant links between attitude and gender, age, work experience and academic title. There are other studies that do not prove such relationships [29]. We were again surprised to find out that the faculty staff, and training healthcare specialists, were unanimous in their understanding and views about e-learning.

Despite the low activity in course development in the LCMS and the prevailing passive use of technologies, the reaction of the respondents to the first statement proves the faculty's proper notion and understanding of the essence of e-learning. This is the statement with the highest level of agreement. In a carefully designed, professionally developed and user-oriented e-learning, the students gain knowledge and skills in a continuous relationship (interactivity) with the learning environment, where the educator retreats from the position of "repeater" of information and takes new roles and responsibilities. E-learning

changes the nurse educator's role compared to traditional face-to-face teaching and learning [8]. Mishra and Koehler state that knowing how to use technology differs from knowing how to teach with it [30]. This is especially true for healthcare educators, who, according to Koch [8], require new/expanded didactical, pedagogical, administrative and technical competences to teach online. The educators in this study are aware that teaching online requires specific competencies (6th statement). Teachers are critical about the essence of e-learning - this is the only statement no one strongly disagreed with, although there were respondents, who did not think they should change their way of teaching (Table 5).

Distance learning has many advantages that meet the didactic characteristics of healthcare students. Quality LCMS courses ensure the autonomy of learner according to the andragogical model – different learning styles are satisfied, learning is following the individual's experience, knowledge, acquired learning habits and cognitive features. We provoked the educators with two statements about allowing distant learning in the training for healthcare specialities. While disagreement is prevailing as per whole distant course, faculty members are careful and hesitant about distant learning within the face-to-face course. A study conducted among healthcare students in the same university reveals a higher level of agreement on distant courses – $M=3.47\pm 1.51$ [1]. The One Sample T-test showed a statistically significant difference between students' and faculty's vision about distant learning ($p<0.0001$). This discrepancy raises another timely question – Are we not lagging behind the students' demands? Probably it is time to focus on developing quality e-learning content that can successfully achieve educational goals outside the university building. Prior experience with teaching in LCMS influences teachers' opinion. Knowing the capabilities of virtual learning environments provides teachers with confidence that they will have the necessary tools to conduct quality distant learning and students will have the functional support of the environment to cope with a well-designed course. The experience in a learning management system is a powerful motivator for faculty's acceptance of e-learning [10].

Our sample's attitudes to blended learning, as most suitable for the healthcare majors are diverse. Although the relative share of staff who strongly expresses their agreement is the highest (31.82%), the relative share of those, who do not agree with this statement is not negligible – 25.00% disagree, 7.95% strongly disagree. We found a statistically significant difference ($p=0.027$) in the attitudes of educators, who do not consider they need to change their teaching style ($M=2.77\pm 1.09$) and the rest of the

sample ($M=3.65\pm 1.38$). Understanding of blended learning is ambiguous. The blended model of learning as it is described by Babic [29], combines different models of learning and teaching. Statistically significant positive correlations were found between the assumption of the suitability of blended learning and:

- the opinion that parts of courses can be learnt distantly – $r_s=0,513$, $p<0,0001$;
- the agreement that whole distant courses are acceptable – $r_s=0.337$, $p=0,001$.

Teachers associate the notion of "blending" with a mix of face-to-face and distance components, rather than online teaching in class or e-learning as a supplement to the face-to-face courses. These results call for a policy change allowing distant components to replace face-to-face classes for some units, responsive to online teaching.

The high levels of agreement to the last two statements (7th and 8th) and the statistically significant moderate correlation between them ($r_s=0.573$, $p<0.0001$) adds to the conclusion that the creation of e-learning is a team task. In the team, the educators will receive support and will build up their competences. Ugvoke et al. also report a high share of educators (79%) who maintain that constant use of LMS in teaching improves professional practice [31]. The experience in online teaching in a LCMS leads to a stronger conviction that a center for e-learning is required. Reliable and robust infrastructure has to be in place to support students and faculty [18].

Faculty staff demonstrates a correct understanding of the e-learning phenomenon. They accept critically and reasonably this educational modality in its blended form. It is not misunderstanding and rejection of online teaching that prevents faculty from developing e-courses, but the sense of unpreparedness. We see the beginning of the solution to the problem in the establishment of a center for e-learning. This center will provide the e-learning development team, and it will work to address the barriers to e-learning. A primary task should be organizing trainings for the staff. Intensive training of university faculty members in the employment of the LMS is an optimal way to increase effectiveness in teaching and learning [32]. Trainings should be hands-on, instructional design based and preferably certified [16]. They should promote andragogy [12] and aim at building skills both for working with LCMS and creating interactive e-content. A practical approach is every trainee to develop their own projects – instructional design based interactive e-courses in the LCMS within their subject competence. The underlying instructional strategies

in these projects should be consistent with andragogy. Thus faculty might receive a personal conviction in the validity and usefulness of technologies which is leading in their adoption [33]. Such trainings would address the "lack of time" problem because, within the course, everyone will design a product that they can directly use in their teaching and the course could be carried out within the working time. Future studies of the feasibility and the effectiveness of such trainings can be conducted.

5. Conclusion

We found the answers to the posed questions in the analysis of the results. Technologies are widely used in teaching, according to the specifics of the content and the competencies built, but technology exploitation is unvaried and insufficient. The experience with computers and technologies is not a prerequisite for e-learning development in the form of e-courses in the LCMS. Despite the positive attitude to e-learning, the activity in the LCMS is weak. The provided e-learning content is predominantly instructive and less interactive and student-oriented. The educators are unanimous in terms of age, gender and length of service about the reasons why they are reluctant to create e-courses, as leading barriers are the heavy workload and the need for support in creating interactive learning content. Teaching in a LCMS builds trust in e-testing and distance learning.

References

- [1]. Tsokova Y., Taneva T., Tornyova B., & Cherkezov T. (2017). Undergraduate Healthcare Students' Attitude to E-learning at Medical University – Plovdiv, *CBU International Conference Proceedings, Prague*, 5, 855-861. <https://doi.org/10.12955/cbup.v5.1038>.
- [2]. Al-alak B. A., & Alnawas, I. A. (2011). Measuring the Acceptance and Adoption of E-Learning by Academic Staff. *Knowledge Management & E-Learning: An International Journal*, 3(2), 201-221.
- [3]. Mata L. (2019). Current Studies Based on the Investigation of the Attitudes Towards the Internet in Higher Education. In *Advanced Web Applications and Progressing E-Learning 2.0 Technologies in Higher Education*, p19. <https://doi.org/10.4018/978-1-5225-7435-4.ch001>.
- [4]. Fernandez-Aleman J. L., Sanchez Garcia A. B., Lopez Montesinos M. J., Marquez-Sanchez P., Bayon Darkistade E., & Perez Rivera F. J. (2014). Exploring the use of information and communication technologies and social networks among university nursing faculty staff. An opinion survey. *Invest Educ Enferm*, 32(3), 438-450.
- [5]. Crews T., Brown C., & Miller J. (2009). Assessing faculty's technology needs. *Educause Quarterly*, 32(4).
- [6]. Koch, L. F. (2014). The nursing educator's role in e-learning: A literature review. *Nurse education today*, 34(11), 1382-1387.

- [7]. Barisone M., Bagnasco A., Aleo G., Catania G., Bona M., Scaglia S. G., Zanini M., Timmins F., Sasso L. (2019). The effectiveness of web-based learning in supporting the development of nursing students' practical skills during clinical placements: A qualitative study, *Nurse Education in Practice*, 37, 56-61.
- [8]. Koch, L. F., Faßhauer, U., & Reiber, K. (2019). E-Learning in bachelor-level nursing education in Germany and the role of the nurse educator-a Delphi survey. *Pflege*, 32(1), 31-46.
<https://doi.org/10.1024/1012-5302/a000653>
- [9]. Marzilli C., Delello J., Marmion S., McWhorter R., Roberts P., & Marzilli T. S. (2014). Faculty Attitudes Towards Integrating Technology and Innovation. *International Journal on Integrating Technology in Education*, 3(1), 1-17.
- [10]. Gautreau, C. (2011). Motivational factors affecting the integration of a learning management system by faculty. *Journal of Educators Online*, 8(1), n1.
- [11]. Faizi, R. (2018). Teachers' perceptions towards using Web 2.0 in language learning and teaching. *Education and Information Technologies*, 23(3), 1219-1230.
- [12]. Noval, J., & Johnson, T. (2018). A Qualitative Study on the Usage of a Learning Management System by Allied Health Faculty. *Journal of allied health*, 47(3), 172-182.
- [13]. Surry D. W., Gray Jr. R. M., & Stefurak J. R. (2010). *Technology Integration in Higher Education: Social and Organisational Aspect*, Pennsylvania: IGI Global.
- [14]. Brinkley-Etzkorn, K. E. (2018). Learning to teach online: Measuring the influence of faculty development training on teaching effectiveness through a TPACK lens. *The Internet and Higher Education*, 38, 28-35.
- [15]. Webb L., Clough J., O'Reilly D., Wilmott D., & Witham G. (2017). The utility and impact of information communication technology (ICT) for pre-registration nurse education: A narrative synthesis systematic review, *Nurse Education Today*, 48, 160-171.
- [16]. Gurley L. E. (2018). Educators' Preparation to Teach, Perceived Teaching Presence, and Perceived Teaching Presence Behaviors in Blended and Online Learning Environments, *Online learning*, 22(2), 197-220.
- [17]. Kitley R., & Ormrod G. (2009). Towards a team-based approach to embedding e-learning within undergraduate nursing programmes, *Nurse Education Today*, 29(6), 623-629.
- [18]. Moskal, P., Dziuban, C., & Hartman, J. (2013). Blended learning: A dangerous idea?. *The Internet and Higher Education*, 18, 15-23.
- [19]. Button D., Harrington A., & Belan I. (2014). E-learning & information communication technology (ICT) in nurse education: A review of the literature, *Nurse Education Today*, 34(10), 1311-1323.
- [20]. Puckree, T., Maharaj, S., & Mshunquane, N. (2015). Status of usage of information communications technology by academic staff at a selected nursing training institution in South Africa. *International Journal of Educational Sciences*, 8(3), 511-519.
- [21]. Sackstein, S., Coleman, E., & Ndobe, T. V. (2019). Lecturers' Perceptions of Learning Management Systems Within a Previously Disadvantaged University. In *Opening Up Education for Inclusivity Across Digital Economies and Societies* (pp. 1-28). IGI Global.
<https://doi.org/10.4018/978-1-5225-7473-6.ch001>
- [22]. Mathers, N., Fox, N., & Hunn, A. (2007). *Surveys and Questionnaires*. The NIHR RDS for the East Midlands/Yorkshire & the Humber.
- [23]. Back, D. A., Behringer, F., Harms, T., Plener, J., Sostmann, K., & Peters, H. (2015). Survey of e-learning implementation and faculty support strategies in a cluster of mid-European medical schools. *BMC medical education*, 15(1), 145.
- [24]. Israel, G. D. (1992). *Determining sample size*. University of Florida: IFAS Extension, PEOD-6
- [25]. Hinton P. R., Brownlow C., McMurray I., & Cozens B. (2004). *SPSS Explained*. London and New York: Routledge.
- [26]. Thompson, M. A., & Deis, M. (2004). Andragogy for adult learners in higher education. In *Allied Academies International Conference. Academy of Accounting and Financial Studies. Proceedings*, 9(1), 107. Jordan Whitney Enterprises, Inc.
- [27]. Moule, P., Ward, R., & Lockyer, L. (2010). Nursing and healthcare students' experiences and use of e-learning in higher education. *Journal of Advanced Nursing*, 66(12), 2785-2795.
- [28]. Coble, R., & Fellow lms-cms, C. G. T. (2018). Learning and Course Management Systems (LMS/CMS). *Vanderbilt University*.
- [29]. Babić, S. (2012). Factors that influence academic teacher's acceptance of e-learning technology in blended learning environment. *E-learning-organizational infrastructure and tools for specific areas*, 3-18.
- [30]. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers college record*, 108(6), 1017-1054.
- [31]. Ugwoke, E., Edeh, N. I., & Ezemma, J. C. (2019). Business Education Lecturers' Perception of Learning Management Systems for Effective Teaching and Learning Accounting in Universities in South-East, Nigeria. *Library Philosophy and Practice*.
- [32]. Alshorman, B. A., & Bawaneh, A. K. (2018). Attitudes of Faculty Members and Students towards the Use of the Learning Management System in Teaching and Learning. *Turkish Online Journal of Educational Technology-TOJET*, 17(3), 1-15.
- [33]. Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning?. *The Internet and Higher Education*, 15(4), 247-254.