MEDICAL DISTANCE EDUCATION - GOOD PRACTICES

Magdalena Roszak[1], Barbara Kołodziejczak[1], Andrzej Bręborowicz[2], Wiesław Półjanowicz[3]

[1] Department of Computer Science and Statistics
Poznan University of Medical Sciences
ul. Dąbrowskiego 79, 60-529 Poznań, mmr@ump.edu.pl
[2] Department of Pathophysiology
Poznan University of Medical Sciences, ul. Rokietnicka 8, 60-806 Poznań,
Higher Vocational State School, ul. Nowy Świat 4, 62-800 Kalisz
[3] Department of Didactics and Modern Technologies in Education
University of Bialystok
ul. Sosnowa 64, 15-887 Białystok, wpoljan@uwb.edu.pl

Abstract: The article presents good practices for medical distance education based only on results of evaluation of blended-learning classes by 231 Polish second year Medicine students. The article was written on the basis of the review of answers given by students to an open-ended question. The article presents good practices as seen from the perspective of a medical student, thus suggesting their priorities in distance education. Not only does it provide material for analysis for knowledge providers and organizers of distance education at a medical school, but it may also serve as an example for other fields of study within natural sciences, health sciences or physical culture studies. The final conclusion supports the interdisciplinary character of the distance education process, and points to the cooperation between the implementing persons (teams). Thus, a certain model of good practices is being built, defined by the authors within three topical areas: work organization on an LCMS (Learning Content Management System) portal, organization and types of learning materials and implemented technologies.

Keywords: blended-learning, distance education, medical education, evaluation, open-ended question, good practices

INTRODUCTION

Motivation

The article presents good practices for medical distance education based only on the results of the evaluation of blended-learning classes by 2nd year medicine students.

The article was written on the basis of the review of answers given by students to an open-ended question. They have become an inspiration for those elements of teaching and the organization of classes involving distance education that are important and valuable for students of medical faculties. The authors attempted to build such a model of good practices only on the basis of an open-ended question; such questions often serve an auxiliary purpose instead of a primary element of evaluation surveys.

Application

The article presents good practices as seen from the perspective of a medical student, thus suggesting their priorities in distance education. These opinions represent students' expectations and provide material for discussion on medical education and a basis for implementing changes in that education. The article may become a kind of case study for distance education, illustrating the characteristics of classes in primary subjects during the first years of medical studies as well as the characteristics of learners. Not only does it provide material for analysis for knowledge providers and organizers of distance education at a medical school, but it may also serve as an example for other fields of study within natural sciences, health sciences or physical culture studies.

The conclusions obtained by the authors can also be compared with the distance education model adopted by knowledge providers before the start of classes, and verified for support in the students' opinions. If these claims are not supported, we should determine to what extent and why the adopted model diverges from the expectations of education recipients.

1. DISTANCE EDUCATION. MEDICAL DISTANCE EDUCATION

1.1 Idea

The implementation of distance education is based on interdisciplinary collaboration within the professional team in charge of the educational resources and class moderation and personnel with IT competences who are responsible for the technical and technological aspect (Kołodziejczak, B., Roszak, M., Ren-Kurc, A., Bręborowicz, A., Kowalewski, W., 2015). The entire work takes place on an LCMS portal, which is the basis for the implementation of distance education.

Distance education is frequently perceived as a "simpler" teaching method than traditional education (Roszak, M., Kołodziejczak, B., Kowalewski, W., Ren-Kurc, A., 2013). Many teachers believe that a well designed and executed e-course can serve its purpose for years without any need for correction for multiple learning groups. Thus, it should offer savings in terms of time and money, as well as an opportunity to reduce the teaching staff in comparison to traditional education. Are these claims supported by students' opinions?

1.2 Material, methods

The data used for analysis in the article comprises opinions of 231 Polish second year students at the Faculty of Medicine, Poznań University of Medical Sciences, who attended a blended-learning course in pathophysiology. These are the opinions of 58% of the class participants who agreed to express their opinions through answering an open-ended question. Two editions of the course were held: the first one during the academic year of 2013-2014 and the second one in 2014-2015. 155 first edition students and 246 second edition participants were surveyed. 60 students (39%) and 171 students (70%) taking part in the first and the second edition, respectively, answered the open-ended question. The open-ended question taken as a basis by the authors of this article was one of several questions included in the class evaluation survey. The following question was asked in the first and second edition of the class, respectively:

a) In your opinion, what should be changed/added/corrected within the ESTUDENT portal to improve this online learning support system?

b) In your opinion, what should be changed/added within the ESTUDENT portal to make it more helpful in studying pathophysiology?

2. RESULTS AND DISCUSSION

It is not the purpose of this article to evaluate the gathered opinions, nor to study them in detail in the context of the study subject. On the basis of the material obtained, the authors are trying to demonstrate a more general learning aspect through indicating those topical areas which are important for the targets of medical education. In this way, they also attempt at defining a general model of good practices as viewed by medical students.

Below is a presentation of the study findings after two course editions. The second edition of the course was extended with audio resources (subject-matter commentary from teachers) as preparation for seminars in the subject, as well as resources for lectures delivered locally. The entire knowledge evaluation and communication process involved LCMS portal tools.

2.1

Research findings obtained after the first edition of the course. The sequence of data presentation depends on the frequency of occurrence, in descending order (Table 1).

<div align="right">Table 1.</div>

Opinions of students who participated in the first edition of the course

Item	Opinions of students who participated in the first edition of the course (60 persons, corresponding to)	No. of opinions (%)
1	Extension of self-tests with short clarifications of the correct answers to test questions, or adding hints to the questions to direct students to the actual problem under review. Presentation of a detailed report after the test is completed, covering the answers given to the specific questions	23 (38%)
2	Possibility of asking the teacher questions and consulting the teacher on selected matters outside the specified time limit	5 (8%)
3	Verification of professional accuracy of self-test questions database. If an answer wrongly recognized as correct is encountered, the student will waste their time making sure whether there are any more errors in other questions.	5 (8%)
4	Availability of refresher tests before the exam, with availability period exceeding 24h, and presentation of exact dates and times in the course schedule well in advance	5 (8%)
5	Online publication in the portal of resources used by teachers during local classes (practice, lectures). This will enable students to prepare better for classes and to take a more active part in the classes, without having to take notes. Publication of other additional learning resources before every test	4 (7%)
6	The contents of questions in the self-test database deviates from the resources/course books used by students, the advancement level of the questions is beyond the range of presented literature	3 (5%)
7	Test questions may be sometimes unclear, concerning some minor tidbits	2 (3%)
8	Duplicated questions in the self-test database. There should be more questions on each topic	2 (3%)
9	Self-test database questions should not be the same as those in the knowledge testing database. This discourages students from learning, enhancing their knowledge, as they are given the opportunity to take the shortcut and just "complete the questions" from the database which will be repeated during the actual exam.	3 (5%)
10	Availability and assistance from the technical team responsible for the portal would be appreciated	2 (3%)
11	It would be reasonable to distribute further information (apart from the schedule and calendar) concerning the availability times of specific resources (particularly tests) so that the students are not surprised when	1 (2%)

	the tests are "closing" at midnight	
12	Change the exam progress parameters, particularly in the case of a large number of test questions	1 (2%)
13	Add interactive clinical cases	1 (2%)
14	It would be reasonable to add resources summing up the knowledge learned in class and knowledge acquired from reading.	1 (2%)
15	First we read the materials covering the given subject and then we do the self-tests	1 (2%)
16	Self-tests are 100% useful as long as they are not mandatory, they are used as self-help, to consolidate knowledge and not to become obligatory homework which will be checked	1 (2%)
17	Praise: the portal is transparent, user-friendly, such classes are a very interesting initiative, everything is working properly, the course was very well prepared, communication via the portal is modern, efficient and useful - congratulations to the author of the idea!	17 (28%)

Source: Own elaboration

Opinions expressed by students after the first edition of the course can be grouped under the following headings:

A. Learning materials - 31 (52%) opinions (items: 1, 5, 8, 13, 14) that comprise information about the students' opinions on additional materials that should be added to the course, which will help them participate in classes more efficiently and organize their learning process better.

B. Subject-matter content - 5 (8%) opinions (items: 6, 7) concerning the level of materials made available within the course. Such suggestions merit certain attention; however, major changes should only be made to the exam questions database after carrying out statistical analysis of test results, with special emphasis on questions with a minimum and maximum score.

C. Customization of learning materials, testing - 31 (52%) opinions (items: 1, 4, 8, 12).

D. Communication within the course, method of moderation - 11 (18%) opinions (items: 2, 4, 11).

E. Adjustments, updates - 8 (13%) opinions (items: 3, 9).

F. Appreciative opinions (praise) consist of acceptance of blended-learning methodology and work on the LCMS portal - 21 (35%) opinions (items: 10, 15, 16, 17).

Summing up, we can see that items A and B are concerned with the learning materials (education content) as such, for which the professional team in charge of implementing the courses are responsible. Items D, E and partly C can be defined as

class organization and teaching methodology, for which course teachers are responsible. This depends on LCMS portal tools and the course teachers' ability to use them in practice. Items C and E are put into practice mainly by the IT team, in coordination with the professional personnel and course responsible personnel.

2. 2

The results obtained after the second edition of the course are presented in Table 2 in descending order.

<div align="right">

Table 2.

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Opinions of students who participated in the second edition of the course

Item	Opinions of students who participated in the second edition of the course (171 persons, corresponding to)	No. of opinions (%)
1	Replace the speech synthesizer with the teacher's voice	66 (39%)
2	Add a file with the presentation contents to the course with audio materials	33 (19%)
3	Extension of self-tests with clarifications of the correct answers to test questions, or adding hints to questions. Presentation of a detailed report after the test is completed, covering the answers given to the specific questions	24 (14%)
4	Publishing files with contents of presentations (audio materials) as printable PDF files	18 (11%)
5	Missing option to reverse audio files (only pause) - some students waste their time listening to the given fragments from the beginning several times	18 (11%)
6	The contents of materials published for local lectures should be printable so that students can add their notes during the actual lecture	10 (6%)
7	Speech synthesizer's accent prevents listeners from focusing on the subject or capturing the essential information, the voice is monotonous, unnatural, makes you tired and drowsy, no intervals between sentences, a distraction, interference with understanding the material	9 (5%)
8	Errors in self-tests, contrary to literature or course materials	9 (5%)
9	Ability to open subject materials and self-testing materials at the same time	6 (4%)

10	More options to take self-tests	5 (3%)
11	Students write down the contents that are read to them; therefore, a text file with the contents of the audio files would facilitate learning. Visual learners are unable to learn by only listening, without seeing the actual contents, and they take notes anyway	4 (2.3%)
12	Ability to use the course throughout the whole semester and not only for the duration of the class	4 (2.3%)
13	Audio comments to text materials should be relatively short; a 3-minute commentary is too long	4 (2.3%)
14	Too high of self-test questions repeatability rate	3 (2%)
15	Course availability should take into account the retake date (after the end of the course)	3 (2%)
16	Possibility of using the materials on tablets	3 (2%)
17	Add audio comments to lecture materials - these will be helpful in case you have not had enough time to take notes during a local lecture	3 (2%)
18	Add a note of whether the reader says exactly the same as shown in the material or adds some extra content so that students do not waste their time listening again, which is time consuming	3 (2%)
19	More text and less reading because more medical students are visual learners, rather than audio learners	2 (1.2%)
20	Add searchable text of the audio files to the course - you can then quickly find the right answer to the question	1 (0.6%)
21	Voice reading out the presentation too fast	1 (0.6%)
22	Add a written coursebook covering the whole material as a refresher	1 (0.6%)
23	Subject course duration is too short considering its requirements, no options for good utilization of all course materials	1 (0.6%)
24	Add more physiology materials	1 (0.6%)
25	Double negations in questions, hard to understand	1 (0.6%)
26	Male and not female reader voice	1 (0.6%)
27	Add animations to present the specific issues	1 (0.6%)

28	Standardize presentation backgrounds	1 (0.6%)
29	Add a course synopsis, videos	1 (0.6%)
30	Too many tabs in the portal	1 (0.6%)

Source: Own elaboration

Opinions expressed by students after the second edition of the course can be grouped under similar headings as in the first edition. However, there are certain differences pointed out by students.

A. Learning materials - 72 (42%) opinions (items: 2, 3, 11, 14, 17, 20, 22, 24, 27, 29), indicating materials which the students believe should be additionally included in the course. A decision to include more materials requested by students must be reviewed carefully by the professional team according to the teaching methodology.

B. Subject-matter content - 13 (8%) opinions (items: 8, 14, 25) concerning the level of materials made available within the course and any errors or omissions occurring during content edition.

C. Customization of learning materials, testing - 90 (53%) opinions (items: 3, 4, 6, 7, 10, 11, 12, 13, 15, 18, 19, 21, 23, 26, 28).

D. Communication within the course, method of moderation - no comments.

E. Adjustments, updates - 9 (5%) opinions (item 8).

F. Praise - 1 (0.6%) opinion (item: 23).

G. Applied technologies and tools - 104 (61%) opinions (items: 1, 5, 7, 9, 16, 20, 30).

After summing up the second edition, we can see a major change - new suggestions are present regarding the method of working with the portal and the applied technologies. This is a consequence of adding new components to the course, including multimedia components (Bednarek, J., 2008; Roszak, M., Kołodziejczak, B., Ren-Kurc, A., Kowalewski, W., 2013). The IT team is responsible for implementation, deployment and testing; however, the aspect of IT competences of participants of the learning process must be considered as well (Ren-Kurc, A., Kowalewski, W., Roszak, M., Kołodziejczak, B., 2012; Kołodziejczak, B., Roszak, M., Kowalewski, W., Ren-Kurc, A., 2014). The proposal to use a speech synthesizer was not approved by medical students - 75 negative opinions were given by 44% of respondents to the open-ended question, which is the opinion of 31% of all course participants.

 It should be emphasized that the second edition students had no objections as to the communication within the course and class moderation.

Based on the analysis of item A components, we may conclude that medical students are strongly attached to static learning materials and have no extensive experience with multimedia and mobile format of the learning process.

Students' expectations concerning the technical implementation of the learning materials, indicate the importance of traditional learning methods (printing, text). This claim would be difficult to implement because it is not possible to put all professional remarks in writing, due to the time required to complete this task. Moreover, there should be more emphasis on some students' wrong approach to the learning process. With all types of contents available within the online course, namely explanations of test questions, detailed materials covering the local classes, detailed comments on the contents, etc., students are not given any opportunity to actively seek knowledge, which decreases their chances of retaining the knowledge longer (Roszak, M., Kołodziejczak, B., Ren-Kurc, A., Kowalewski, W., Bręborowicz, A., 2013). It is the teachers' task to convince students that this is a wrong path that lowers their chances to memorize the material successfully. This is quite an alarming indication, which is also pointed out by first edition students (Table 1, item 9).

2. GOOD PRACTICES

The above list of items A through F (Chapter 2.1) and the list of items A through G (Chapter 2.2), and both after the first and the second edition of the course, supports the interdisciplinary character of the distance education process, and points to the cooperation between the implementing persons (teams).

Thus, a certain model of good practices is being built, defined by the authors within three topical areas: work organization on the LCMS portal, organization and types of learning materials, and implemented technologies.

This can be presented in more detail as follows:

1. Teaching/learning organization and methodology - implementation, use of the portal, technical issues. The IT team will be primarily responsible for this aspect, in cooperation with the professional team.
2. Learning materials organization - format, types of materials, contents and updates - the professional team, in cooperation with IT, will be responsible for this area.
3. Tools and technologies applied - only the IT team is responsible.
4. Customization of tests, self-tests, other learning materials, including their availability, time limits - this is managed by the IT team, in cooperation with the professionals.

Success of distance education largely depends on good planning, organization of classes, and learning materials (Ren-Kurc, A., Roszak, M., 2011; Roszak, M., Kołodziejczak, B., Kowalewski, W., Ren-Kurc, A., 2013). These are

commonly acknowledged standards which are not always properly implemented, or may be disregarded in the education preparation process. As we can see, the responsibility for its successful execution relies on good cooperation between these two teams, namely the IT and the professional team. Therefore, we can claim with a high level of certainty that distance education could not exist without the IT team, but IT experts would not be able to implement distance education in any topical area without the professional team. Any changes to online courses must be justified and consistent with the learning principles so that they support the knowledge acquisition process and enhance its efficiency (Bramley 2011, Mokwa-Tarnowska 2014). Asking questions and actively seeking the answer has always been, and still is, the essential type of mental activity throughout the learning process.

CONCLUSION

Distance education (Meger 2010) is a verified and necessary teaching/learning method that requires interdisciplinary cooperation between teachers and IT teams (Półjanowicz, Roszak, Kołodziejczak, Kowalewski 2014). A well designed and executed online course can remain useful for years, but must be adjusted, modified and updated, and any such adjustments and updates must be included in the teachers' working times. Financial investments in distance education are not lower than those applicable to traditional education - multimedia require a lot of effort, technologies must be supported and monitored by administrators.

These conclusions should be extended with online classes efficiency analysis (Półjanowicz, Roszak, Kołodziejczak, Bręborowicz, 2014, Półjanowicz, Mrugacz, Szumiński, Latosiewicz, Bakunowicz-Łazarczyk, Bryl, Mrugacz, 2013). At the moment, the authors are working on the efficiency analysis of the first edition standard course and on the findings after implementation of extended multimedia methods occurring in the second edition of the course for the first time (Kołodziejczak, Roszak, Ren-Kurc, Bręborowicz, Kowalewski 2015). Results of such research will supplement good practices in medical education.

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