University of West Hungary
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INCREASING EDUCATIONAL EFFICIENCY BY DEVELOPMENT OF DIGITAL COURSE BOOK

Abstract of the Ph.D. Thesis

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Introduction

The one of the most important question of the pedagogy is that the efficiency of cultural transmission what level materialized in practice; what way can be increases the effectiveness of it at same resources. The „effectiveness" word is became key idea in the education as in every sectors of our altering society, you more often meet with it at micro and macro level of pedagogy. The education has been strongly changing since the 19-20. century's reform pedagogy, and has to face the challenges of the informational bang at the end of 20. century: competent citizens have to be trained for the informational society. The amount of accessible information is unbelievably grown and the every area of our life is changed by the information access mechanism, so the ways of communication and getting information is wildly different between the generations.

According to these changes new educational materials and methods have appeared in the educational market reclining mostly digital technics. But the digital educational market has many serious problems in Hungary. The utilization rate of the published new educational tools has still low in the educational practice. Teachers working in practice do not like to use these tools because they would have to change their old methods and strategies. They feel the efficiency of these technics are not enough proved. Truly, in the Hungarian and international practice there is also typical, that the published digital educational tools development has serious resources but are not tested in the pedagogical practice. (Ying - Koh, 2006).

These facts lead us to start the development of a digital course book and after development to try in the practice and to prove its efficiency by pedagogical researches. The selected area we find to digitalize was the sport courses of social pedagogy training at Benedek Elek Faculty of the University of West Hungary. Fit to the social pedagogy training's needs the theoretical and practical materials of health courses are important part of the social professions. The students are not only helped by these courses to keep their fitness and healthy but to be able to use this knowledge in training others (Bucsy, 2003). We digitalized these courses (Sportrecreation, Leisure time sports theory and practice I., II.) and made e-learning materials for keep the quality and increase the efficiency of education.

The dissertation discusses the way the digital course book was made, the examinations of efficiency related this investigation and the results of this research and in this way the connection between pedagogical efficiency and development of digital course book by a concrete development.

1. Survey of the Hungarian sport multimedia market

Methods

The numbers of Hungarian e-learning materials in shops and internet are many thousands but their numbers in pedagogical practice are minimal. This fact is especially true in area of sport pedagogy. Just a few of e-learning materials treat the sport topics and there are no significant demand of them. These materials were studied by document analysis examining the quality expectations (pedagogical, aesthetical, structural-communicational, programming-technical quality layers).

Results

Considering that the numbers of the Hungarian e-learning materials are minimal these publications would be itemized listed. In summer of 2003 the next sport e-learning materials were found in Hungary:

In FÓKUSZ book-supermarket (Budapest):

- International Encyclopedia of Sport I. (Woodstone Interactive, 1999),

- High-level Fitness - Alexandra Beres (Infomania Digitalmedia, 2001),

- Encyclopedia of Formula I (Infomania Digitalmedia, 2000),

- Mountain Bike (UNIT, 2001),

In TESCO Hypermarket (Sopron):

- Extreme Sports (Infomania Digitalmedia, 2000)

At Faculty of Physical Education and Sport Science of Semmelweis University

- Functions of Muscular System (HUPE, 1999)

- Modern Technics of Four Swimming Strokes (HUPE, 1999)

There were no other e-learning materials in other bookstores or dealers (AUTOMEX, FIRESTONE). Beyond that some electronic books were found in the internet portal of Hungarian libraries (OSZK, MOKKA):

- Pedagogy of Physical Education I. course book (Ozsváth K, 2003)

- Bibliography of Hungarian Training Theory (Farmos I.-Harsányi L, 2003)

- Surviving School (Makrai T., 2003)

Of course, there must be many other sport multimedia publications in Hungary made by small workgroups, scientific departments, like interactive distance learning portal of the Physical Education and Sport Science Department of College of Nyíregyháza, or sport CD-ROM series of Psychology Department at Faculty of Physical Education and Sport Science of Semmelweis

University at the end of 2003. These publications signed this process continuously increases. The detailed analysis of mentioned materials was shown they were professional, good edited publications, but they had some deficiencies especially in pedagogical and structural-communicational quality layers.

The other three publications (Pedagogy of Physical Education I. course book, Bibliography of Hungarian Training Theory and Surviving School) were different, they were rather traditional course books in electronic forms.

Conclusions

The Hungarian sport multimedia materials in spite of their deficiencies would be useful tools for sport pedagogy but theirs numbers were small so the physical educational practice did not apply them.

2. Preliminary student survey

Methods

Several years before developing the teaching materials, a written survey was made to determine the possible usefulness of digital materials among the Social Pedagogy Training department first-year students. Their knowledge of basic computer skills was surveyed as well. The questionnaire was given to 83 students in 2002, 88 students in 2003, and 87 students in 2004, all of whom were first-year, full-time students at the time. Furthermore, in 2004 the questionnaire was expanded to include correspondent students, which made a total of 169 students. This total consisted of 82 students from Sopron and 87 students from Papa .

What the researchers wished to determine was what percentage of students actively used their own computer, surfed the Internet, and how many years if any had they studied computer science related subjects. The results of their computer cognizance and basic competency levels were then mapped out (European Commission, 2005). Moreover, the survey asked supplementary questions pertaining to health culture using standard basic sociological information science questions (Aszmann, 1997). Students filled out the questionnaires at the beginning of each school year.

Results

Of primary interest was how the percentage results within the main categories would be distributed and changed. The results can be seen in *Table 1*.

Table 1: Results of the preliminary questionnaire that polled students on the number who own a computer, have Internet access, and have a previous background in computer science

	Full-time students in Sopron			Correspondence students in Sopron	Correspondence students in Papa
	2002	2003		2004	
Home Personal Computer (PC)	59 %	70 %	80 %	85 %	80 %
Home Internet access	27 %	40 %	48 %	51 %	45 %
More than 4 years of preliminary computer science study	41 %	59 %	61 %	13 %	15 %

The table's data plainly show that the bulk of the students use their own computer, but that only every other student has Internet access available at home. There existed, however, a serious variance between the groups - that is, full-time and correspondent students - which was primarily a difference in age. Results also indicated that personal home computer use and Internet access at home is increasing among the students year by year, and knowledge of computer sciences is on the rise.

Conclusions

Home use of the Internet in 2004 among the students still remained around 50%, which obviated to the researchers that they would not be able to devise teaching materials based on Internet access. Therefore, they would not be able to employ classic e-learning frameworks. Parameters at this time do indicate positive change. Within a few years the students' digital competency as well as expanded Internet possibilities will have reached a practicable level, indicating that such materials could be employed in a correspondent teaching curriculum sometime in the future. At this time, however, a self-contained work on CD-ROM had to be developed in order that students could bring it home.
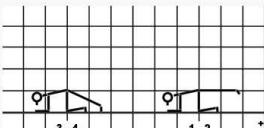
3. Digitizing the instruction materials

For the task of developing and digitizing the instruction materials, the authors relied upon previous work in sport e-learning research and development created both here in Hungary and abroad (Kokvay, 2003, White & Bridell, 2003). Digitization was created by NeoBook software (NeoSoft Corp., 2003). During compilation, the Physical Education subjects themselves (Sport recreation, Leisure time sports theory and practice, I and II) naturally played a decisive role in

determining what materials to include, though related research results were taken into account as well. The resulting digital book was called *Sport Recreation: a Digital Course Book of Basic Knowledge on Recreational Training*. The book's chapters are divided thematically. The subsections of the book follow the general requirements of digital material: they strive to be understandable, transparent, and user-friendly. The headings of the book touch upon the following topics: the basics of sport recreation, the role of sports in the preservation of one's health and welfare, concepts in the dynamic development of exercises and its components, stages of fitness at various age levels, and recreational training basics and their constitution. Moreover, the book's supplement contains charts of analysis along with their results. It may be noted here that at the beginning of the project, far more theoretical and practical materials were developed and worked up into the model than were actually necessary. The conviction had been that such materials would be advantageous for future work. Thus, a formidable tool known as an "input approach" could be exploited in other subjects of study too.

At the time of compilation, the authors wished to develop the material in such a way that it was not only instructive for its target audience, but that it could be of help to those outside of the subject's ordinary domain as well (i.e. people interested in recreation and sports, or anyone making use of these subjects in his or her line of work). During compilation the main criteria for the book were content and understandability. For this reason, when selecting the form for the recreational related materials and web-pages, the work was given a similar overall appearance to other sport e-learning materials presently in circulation (Ying-Koh, 2006). On the other hand, the user was naturally taken into consideration, and therefore the authors aimed to create materials that embodied ease of navigation and would allow for self-motivated study (Forgo – Hauser - Kis Toth, 2005).

The teaching approach to kinetic movements in the course book was described using texts, graphics and videos. Thus the three communicative vehicles supported each other and aided in understanding. A visual example of this may be seen in ***Figure 1.***

Figure 1: *A sample page of the digital book showing the application's structure with the main menu on the left side and the three demonstration channels of movement material on the right*

In the digital course material's structure a place had been given for testing and self-testing. There are self-help questions at the end of every heading and subheading. Here the user can click on a choice of related topic questions and test his or her knowledge. An important part of the work is the *Test and Exam* module, which gives students the opportunity to take a trial exam similar in form and content to one that would ordinarily be required on the subject, but at the students own leisure using the CD-ROM on their own computer. The exam questions are chosen at random from a data base not known by the students ahead of time. In this way rote learning has been avoided. (In actual practice, students are tested with this same exam module; in this way the department of information can give exams online, allowing students to give an account of what they know.)

Furthermore, the course book was developed in an audio version so that the visually challenged might benefit from the use of the materials. The audio text is activated by mouse and keystroke commands. In the interest of integrating the materials into a traditional educational framework, the authors decided to release a conventional paper text, too, for the sake of presenting related subject course items and special terms.

4. Quality control

Methods

The created digital package of educational material was first employed in the Social Education department in the 2004-2005 academic year. At the beginning of the second semester, a written questionnaire was distributed among the students about the digital course book, inquiring about its quality, ease of use, and any faults the students might feel it had. Most of the questions were answerable on a scale of one to five using the Likert scale, though there were fixed questions and an open-ended question as well. The open-ended question allowed students to voice any personal opinions about the course book in their own words. The filled out questionnaires from the 218 students (123 correspondent students, 50 part-time students, and 45 full-time students) appraised the work ranked the digital course book from top to bottom (e.g. aesthetic questions, technical program questions, communication structure questions). The results as well as the standard deviations have been compiled and can be viewed in ***Table 2***.

Results

The results clearly indicate that the students were satisfied with the digital course book both in its parts and as a whole, giving the book a "B" average. In reply to the overall question "What grade would you give this digital course book?" the means differentiated by class divisions (full-time mean, 4.22; part-time mean, 4.12; correspondent student mean, 3.92) as well as the standard deviations (full-time, 0.64; part-time, 0.72; correspondent, 0.81). This is shown in the target diagram (***Figure 2.***)

Table 2*: Students' opinions about the digital book on a scale of five*

Value layer	Mean	Standard deviation
Aesthetic questions	4.07	0.85
Technical-programming questions	4.06	1.23
Structural – communication questions	4.30	0.87
Overall question	4.03	0.76

Conclusions

The opinions of the full-time students in means and standard deviations show that, in contrast to the older part-time and correspondent students, the younger age group is more predisposed and open-minded toward digital materials. The results of the analysis of the open-ended questions on the survey revealed that the students would gladly use the e-learning format in other subjects as well.
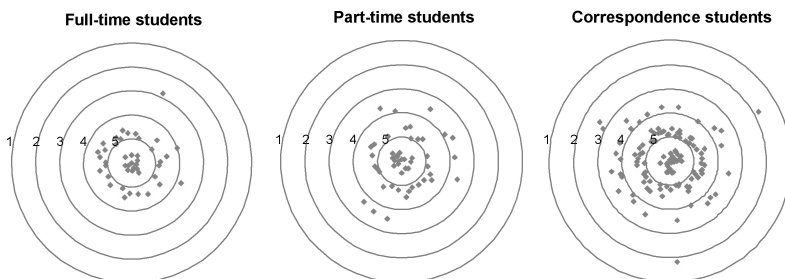
Figure 2: Distribution of answers to the question, "Give an overall mark to the digital book!" Arranged from left to right: full-time, part-time and correspondence students (the random amplitude is 0.5)

5. Educational experiment

Methods

Moreover, the authors sought to determine how the digital course book compared in effectiveness with conventional teaching materials with the students. This is why an experiment was conducted using three subjects of study (Sport recreation, Leisure time sports theory and practice, I and II). A test group (133 correspondent students in Sopron) studied with the digital educational materials, while the control group (99 correspondent students from Papa) studied with conventional textbooks. The learning materials, the subjects of study, the presentations during lessons, and even the test questions were wholly identical in both cases. Therefore, the measure of effectiveness of each method would be determined by the test results from the final exam given to the students at the end of the term.

In that students had no previous experience with the contents of the tested school subjects, it was thought that a pre-test would neither serve the purpose or give the desired results. To validate the experiment, a homogeneity test was applied instead of a pre-test in order to determine to what extent the members of the two groups could be considered randomly selected. In this case, with random assignment to groups, the results may be considered valid without a pretest (E. Babbie, 2004).

A filled-out questionnaire explored the similarities of each group in four areas or dimensions, with altogether twelve questions used in the examination: age (one question), interest in sports (four questions), digital competency (three questions), and learning attitudes (four questions). Questions could be answered by choosing from between three to eight categories. A Chi-square

(χ^2) test was the mathematical tool used to examine the homogeneity of the groups, where the four dimensions were compared to get the distribution of the two groups. Comparison of the Chi-square distribution was made at 1% level of significance. Out of the fifteen questions randomly assigned, eleven revealed the two groups to be homogenous. (**Table 3**).

The results of the final exams were compared in two sample T tests. As these two samples had identical standard deviations, this was considered the appropriate method for discovering if any given significant was to be displayed. A null hypothesis has been assumed, that there was no difference in knowledge levels between the two groups.

Prior to the T test an F test was given, where it was verified that the standard deviation of the two samples could be deemed equal. Results were submitted to a T test, or Welch test, where a theoretical significant level of 0.05 was taken into consideration.

Table 3: Results of the homogeneity test based on the questions relating to different parameters

| Dimension (questions)	Chi-square test		Homogeneity (Y/N)
	Calculated	Theoretical (at 1%)	
Age			
1st question	6.67	16.81	Yes
Sporting attitudes			
1st question	9.46	18.48	Yes
2nd question	34.34	15.09	No
3rd question	6.77	13.28	Yes
4th question	2.53	9.21	Yes
5th question	7.15	9.21	Yes
Digital competency			
1st question	6.64	13.28	Yes
2nd question	6.79	13.28	Yes
3rd question	39,81	15.09	No
4th question	7.69	15.09	Yes
Learning attitudes			
1st question	6.24	13.28	Yes
2nd question	14.34	13.28	No
3rd question	12.02	13.28	Yes
4th question	4.30	13.28	Yes
5th question	14.41	13.28	No

Results

The results of the experiment are grouped together in **Table 4.** One can readily see from the table that the group benefiting from the digital course book had significantly better results in all three subjects covered in the experiment when compared to the students who made use of conventional educational materials. This is shown in **Figure 3.** as well.

Conclusions

The educational experiment demonstrates that for the instruction of sport related topics in the Social Education department, the use of digital educational materials was in fact more effective.

Table 4: *Results of the tests of the experimental and control group and the significance of difference between the two groups*

Subject	Experimental group (133 persons)		Control group (99 persons)		T-test/Welch test results $p < 0.05$
	Mean	Std. dev.	Mean	Std. dev.	
Sport recreation	3.57	1.19	3.26	1.14	t = 1.99 (T test) significant difference
Leisure time sports theory and practice I	4.06	1.03	3.08	1.07	t = 7.06 (T test) significant difference
Leisure time sports theory and practice II	4.76	0.56	4.48	0.96	t = 2.64 (Welch test) significant difference
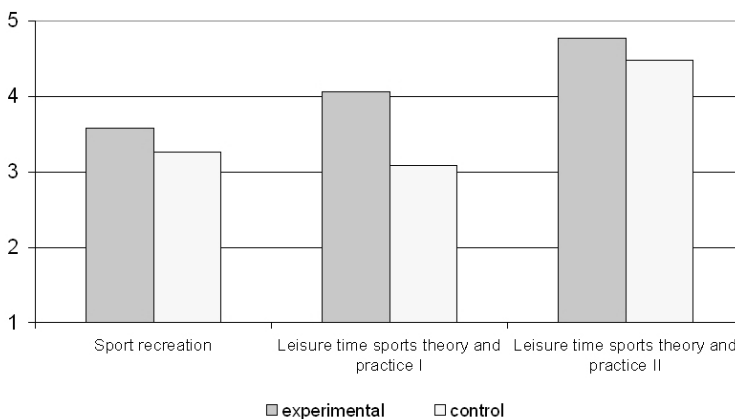
Figure 3: *The experimental (Sopron, 133 persons) and control (Papa, 99 persons) group according to the examination subjects in the experiment.*

6. Research of educational efficiency depended on digital competency, sporting and learning attitudes of students

Methods

In this phase of our research we examined connections between the sport pedagogical efficiency and the input parameters. The students were divided into two groups, a strong and a weak group by the chosen three parameters (digital competency, sporting attitudes, learning attitudes). We searched the significant differences of posttest results between the strong and weak groups supposed the connections of the efficiency and the parameters. We used the same questionnaire as the survey of homogeneity. Unfortunately the item numbers of samples were so small that the statistical analysis became unreliable.

Results

The means and the standard deviations of the three courses' results were calculated in the strong and weak groups. We examined the differences between the strong and weak groups in every three courses, in cases of every three parameters by statistical tests (***Table 5***.).

Table 5.

The significant differences between the strong and weak groups in every three courses, in cases of every three parameters

Sporting attitudes					
Groups (strong/weak)	Degree of freedom (N_1/N_2)	F - test	T - test possible	T -test	Significant different
Leisure time sports theory and practice I.					
Full-time students	72 (39/35)	1.27	Yes	2.07	$p < 0.05$
Part-time students	25 (14/13)	0.50	Yes	2.20	$p < 0.05$
Leisure time sports theory and practice II.					
Full-time students	72 (39/35)	1.68	Yes	1.75	$p < 0.1$
Learning attitudes					
Sportrecreation					
Part-time students	25 (22/5)	2.39	Yes	2.40	$p < 0.05$
Correspondence students	71 (52/21)	0.82	Yes	3.07	$p < 0.01$
Leisure time sports theory and practice I.					
Correspondence students	71 (52/21)	1.09	Yes	2.13	$p < 0.05$
Leisure time sports theory and practice II.					
Correspondence students	71 (52/21)	0.09	Yes	4.49	$p < 0.01$

There were no unambiguous connections between the sporting attitudes and the post-test results, the data were contradictory. The results of full-time students were significantly worse in the case of two courses, but same relation were not signed in the correspondence students groups. Studying the result of digital competencies there were no significant connections between the strong and weak groups nor in full-time, neither the correspondence students groups. The results of the strong and weak groups were very different in the case of learning attitudes. Almost in every students groups, in cases of every courses the result of the strong groups were better like in the weak groups. Statistical significant differences were in the groups of the part-time and a correspondence students.

The considerable gaps of the means did not yield statistical differences because of the high values of the standard deviations. That means the connection between the learning attitudes and the educational efficiency was existing but the small item numbers of samples was not able to exactly proved.

Conclusions

The connection of between the three examined parameters and the educational efficiency was proved uncertainly but the learning attitudes affected the results of post tests: the educational efficiency was high in groups of students with positive learning attitudes than the other students.

7. Integration of the course book in the pedagogical process

Many, excellent digital educational materials have been made to improve the effectiveness of teaching, but most of them are not in use, they haven't integrated in the pedagogical process. Exactly for that, in the case of our self-made course book we have already made an effort in the developing period to integrate it in the education. Trusting in that, if we can fully integrate this into the educational process then the connection between the effectiveness and the use of this digital course book will prove the statement in itself. However by the fact that more teachers have taken part in the teaching of the examined sport subjects and they defined the exercise in other ways a kind of a call-back-experiment happened.

So, all of the teachers have been informed about the goal of the experiment, the curriculum should be taught, the digital and the traditional method of the examinations, and all of them received the basic lecture-presentations as well. Despite of it in the lectures of the Leisure time sports theory and practice I. at the group of Pápa the taught curriculum was not exactly the same as it was in Sopron. The taught curriculum not in basic but in details and in accent were different from the course book and even it did not lean on the lecture-presentations. At the

same time the examination was an written exam and contained the very same questions we compiled and what was at the groups of Sopron. That was why, at the first exam 49 students received „D" or „E" marks from the whole 93 persons.

Even out of the students got „D" a lot would have failed originally but the tutor changed their marks to „D" based on the performance presented on the practical courses. Consequently we really can take this as an call-back-experiment where in the experimental group the used the educational material was not an integrated part of the pedagogical process, while in the other groups the educational material worked as an integrated part. Although at the group of Pápa the traditional course book was used not the digital version, our statement is still valid: only an existence of an education material and it's availability is not a guarantee to the improvement of education efficiency. All of this well indicate that if the tutor of the subject not lean on the chosen education material, do not feel it as his own and do not execute the educational process with these methods, then the tool do not reach its goal and became unnecessary. So it have to be the first step for every course book-developer to investigate extensively and exactly the teachers working on the wants scientific area.

8. Summary – Recommendations

The research and development project proved, that the improvement of the educational efficiency by digital curriculum-development is possible. The processed scientific area's speciality defined primary the frames and margins of the development. The educational efficiency have to be determined exactly before the development what tightly relate the given scientific area and the given subject's goals by it's normative nature and it's role in the pedagogical process. Furthermore the motivational base and the attitudes of the teachers and the students are also important factor of the improvement of the efficiency. Because the digital educational material can not fill the role meant to it, without integrating in the pedagogical process of which basic condition is the positive approaching of the process' participants. The experiences of our research and development project are such establishments, summarized into recommendations, what we think are useful for professionals who deal with similar researches:

- It's became timely to develop a „Digital Pedagogy" course book what could be used as an compass to other similar project's participants.
- The basic condition of making really efficient pedagogical tool is to analyse precisely the educational goals.

- Our research and development project showed there is impossible to make an useful education material without pre-survey of claims and possibilities of the students.

- During the development it turned out that an pedagogical material can only be made by such a teamwork where the different specialists are plead by innovative and cooperated professionals.

- The quality of the course book depends on the quality of the different sides of the development. If at any stage of the development a bad compromise born, then it will have effect on the final summing up and on the usefulness of the educational material.

- The most difficult stage of the digital curriculum developing is the testing, for that a lot of time should be planed and intended, because the users got used to the professional programs will not use an application with full of failures independently from it's intrinsic values.

- The development team should count on the problems of the manufacturing and safety in the case of the publication is in CD-ROM medium.

- The interactive educational material are not only capable of acquirement the given learning area, even in the spread of common digital culture take a role, as our students reported they would likely see such educational materials at other subjects, turning out from the research data.

- The pedagogical use of the multimedia course book pointed that in the case of learning with an digital tool the trap of the mechanical learning is more difficult to avoid, so in this teaching method the execution of the complex forms of teaching should be observed especially.

- The examination by computer improves the education efficiency, because it is more correct and faster way of examining than the traditional versions.

- Our educational experiments declare that the digital course book in the (sport)pedagogy can only be used in a mixed form – by the parallel use of the traditional and digital methods (blended learning)

9. References

1. Aszmann, A (1997): Higher Education, Intelligentsia, Health, MEFS

2. Babbie, E. (2004): The Practice of Social Research, Wodsworth Publishing Company, Chapter 8.

3. Bucsy, G-ne (2003) Research on Sociopedagogy Students' Health - Cultural Behaviour, with Special Respect to Physical Activity, *PhD dissertation*, SE TF, Budapest

4. Csala P - Csetényi A –Tarlós B (2001) Bases of Computer Sciences, Computerbooks, Budapest

5. Encyclopedia of Formula I.(2000), CD-ROM, Infomania Digitalmedia Kft., Bp.

6. European Commission (2005) Information Society and the media working towards growth and jobs, http://europa.eu/scadplus/leg/en/cha/c11328.htm

7. Extreme sports (2000), CD-ROM, Infomania Digitalmedia Kft., Bp.

8. Farmosi I. - Harsányi L.(2003): Bibliography of Hungarian Training Theory, www.mek.iif.hu

9. Forgo, S. & Hauser, Z. & Kis Toth, L (2005) E-learning and Quality Assurance of Curriculums *http://www.ektf.hu/tavoktatas/e_learning_minosites.pdf*

10. Functions of Muscular System (1999), CD-ROM, HUPE, Bp.

11. High-level Fitness, Béres Alexandra (2001), CD-ROM, Infomania Digitalmedia Kft., Bp.

12. International Encyclopedia of Sport I. (1999), CD-ROM, Woodstone Interactive

13. Kokovay A (2003) Experiment of Distance Learning in Teaching of Gymnastics, *Conference of Multimedia in Pedagogy*

14. Makrai T.(2003): Surviving School, www.mek.iif.hu

15. Modern Technics of Four Swimming Strokes (1999), CD-ROM, HUPE, Bp

16. Mountain bike (2001), CD-ROM, UNIT Kft., Bp.

17. NeoSoft Corp. (2003) NeoBook professional multimedia, *www.neosoftware.com*

18. Ozsváth K (2003): Pedagogy of Physical Education I., ELTE TOFK, Bp.

19. Thomas, A & Stratton, G. (2006) What we are really doing with ICT in physical education: a national audit of equipment, use, teacher attitudes, support, and training, *British Journal of Educational Technology Online Early*, http://www.blackwell-synergy.com/doi/abs/10.1111/ j.1467-8535.2006.00520.x

20. Ying, L.W. & Koh, M (2006) E-learning: New opportunities for Teaching and Learning in Gymnastics, *The British Journal of Teaching Physical Education*, 37/1. 22-25.

21. White B.A. & Bridwell C (2003) Distance Learning Techniques in *Galbraith M. W.: Adult learning methods: A guide for effective Instruction, 3rd edition, Chapter 14, Krieger Pub., Melbourne*

10. Publications of author

Foreign reviewed publications

1. Katona,Gy (2007): The use of digital materials for instruction in sport topics at the University of West Hungary, International Journal of Education and Development using ICT, Vol. 3., IJEDICT, West Indies, Barbados, http://ijedict.dec.uwi.edu

Foreign non reviewed publication

In foreign language

1. Katona Gy (2007): Applying ICT for physical education at University of West Hungary, Partiumi Egyetemi Szemle, Nagyvárad, Románia (publication pending)

2. Катона Дьордя (2007): E-booky фізкулътрі в Університеті Західної Угорщини, Ministry of Education and Science, Transcarpathian State University kiadványa, Uzhhorod, Ukraine (publication pending)

In Hungarian

1. Katona Gy (2006).: Digital course book in education of sport subjects at University of West Hungary, Magiszter, IV. évf. 2.sz. 114-120., Csíkszereda Románia

Course book in Hungarian

1. Bucsy G.né - Katona Gy (2004): Sportrecreation, digital course book about basic knowledge of recreational training, CD-ROM, ISBN 963 9364 64 9, NyME BPFK, Sopron

2. Bucsy G.né - Katona Gy (2006): Recreation theory and practice, digital course book, CD-ROM, ISBN 963 9364 76 2, NyME BPFK, Sopron

Hungarian reviewed publications

In foreign language

1. Katona Gy. (2007): The use of digital materials for instruction in sport topics at the University of West Hungary, Education and practice, 2007/1., Kaposvár

In Hungarian

1. Bucsy G.-né - Katona, Gy. (2001): Survey of sport motivation of social pedagogical students. Magyar Sporttudományi Szemle, 2. 18-20.

2. Bucsy G.-né - Katona, Gy.(2002): Survey of physical fitness and power level of woman students. Magyar Sporttudományi Szemle, 1. 8-12.

3. Bucsy G.-né - Katona, Gy.(2004): Health-cultural behaviour of woman socialpedagogical students. Kalokagathia 2004.1-2.sz., 109-120.

4. Katona Gy. (2006): Digital course book in education of sport subjects at University of West Hungary, Magyar Sporttudományi Szemle, 7.évf. 27.sz., 7-10.

Hungarian non reviewed publications

1. Bucsy G.né - Katona Gy.(editors) (2001): Credit system in social pedagogical education, Conference review, Sopron

2. Bucsy, G.-né - Katona, Gy.(2002): Evolution of physical power of young adults. Survey of physical level and fitness of woman students., HSSSOL, Sport periodical, www.btf.hu/testnev/hsssol/

3. Bucsy G.né - Katona Gy.(2004): Compared survey of physical power of social pedagogical and kindergarten students, Health-cultural behaviour descriptions of social pedagogical students, Studies, NyME BPFK, Sopron

4. Bucsy G.né - Katona Gy. (2004): Survey of sport motivation of social pedagogical students, Health-cultural behaviour descriptions of social pedagogical students, Studies, Sopron

5. Katona Gy. (editor) (2005): The Science Day 2004, Sport and Education, Conference review, NyME BPFK, Sopron

6. Bucsy G.né - Katona Gy. (2005): Sport pedagogical analysis of the Sportrecreation digital course book, Research of subject's pedagogy, Studies, EJF, Baja

7. Katona Gy. - Bucsy G.né (2005): Examination by a digital sport course book, Research of subject's pedagogy, Studies, EJF, Baja

Hungarian conference presentations and publications

1. Bucsy G-né - Katona Gy. (2000, 2001): Effects of higher educations on health-cultural behaviours of students, The Science Day 2000. Sopron

2. Katona Gy. - Egedi C. (2001, 2002): Social psychological dimensions of Internet, The Science Day 2001, Sopron

3. Katona Gy. - Dárdai Á. (2001, 2002): Multimedia in music education. The Science Day 2001, Sopron

4. Bucsy G.-né - Katona, Gy. (2001, 2002): Survey of port motivation of social pedagogical students. The Science Day 2001., Sopron

5. Závotiné - Gödéné T.I. - Katona Gy (2001, 2002): What does my teacher have to be?, Compared survey of expectations of students for teacher's personality, The Science Day 2001, Sopron

6. Bucsy G.-né - Katona, Gy. (2002): Survey of health-cultural behaviours of social pedagogical students especially point of view of their physical activity. Educational Science Conference II., Budapest, http://felis.elte.hu/pedconf

7. Katona, Gy. - Dárdai, Á.(2002): Multimedia in music education. Computer Science in Higher Education Conference, Debrecen

8. Katona Gy. - Mihalicz A.(2002, 2003): Development of computer system at our department depended on European expectations, The Science Day 2002, Sopron

9. Bucsy G-né - Katona Gy.(2002,2003): Compared survey of physical power of social pedagogical and kindergarten students The Science Day 2002, Sopron

10. Katona Gy.(2003.): Quality measurements of sport multimedia publications, Sport Science Conference IV., Szombathely

11. Katona Gy.(2003): Multimedia in Kindergarten, Computer Science in Kindergarten Education in Connection to EU Conference, Sopron

12. Katona Gy.(2003, 2004): Quality measurements of sport multimedia publications, The Science Day 2003, Sopron

13. Katona Gy.(2003): Multimedia tools in sport pedagogy, Educational Science Conference III. Budapest

14. Bucsy G.né - Katona Gy. (2004): Sport pedagogical analysis of Sportrecreation digital course book, Educational Science Conference IV. Budapest

15. Katona Gy. - Bucsy G.né (2004): Examination by a digital course book, Educational Science Conference IV., Bp.

16. Katona Gy. (2004): Efficient learning methods, E-learning, Sameness and Differences in Education System of EU Conference, Pápa

17. Katona Gy. (2004, 2005): Development of digital material in physical education, The Science Day 2004, Sopron

18. Bucsy G.né - Katona Gy. (2004): Sport pedagogical analysis of Sportrecreation digital course book, Research of Subject's Pedagogy Conference VII., Baja

19. Katona Gy. - Bucsy G.né (2004): Examination by a digital course book, Research of Subject's Pedagogy Conference VII., Baja

20. Katona Gy.(2005): Efficiency survey of a digital course book, Educational Science Conference V. Budapest

21. Katona Gy.(2005): Sportrecreation course book and learning attitudes in social pedagogical education, National Sport Science Conference V., Budapest