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USE OF LEARNING MEDIA AND TECHNOLOGY BY PREPARATION AND REALIZATION OF MUSIC LESSONS

UPORABA NASTAVNIH SREDSTAVA I POMAGALA TE OBRAZOVNE TEHNOLOGIJE U PRIPREMI I IZVEDBI NASTAVE GLAZBENOG ODGOJA

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A b s t r a c t

The paper presents the usage of learning media and education technology in music lessons. The aim of the empirical research was to study the learning media usage in preparation and realization of students' presentation in music education lessons. There were 105 students participating, attending 4th year for elementary education at the Faculty of Education at the University of Maribor, Slovenia. The results have shown that during preparation for music lessons and in class students mostly use traditional learning media. When performing in the classroom they mostly use CD player and keyboards, while during preparation for the lesson they use computer, student book, workbook, CD player and keyboards. The time of usage of the media is much longer when preparing lessons as compared to the time needed when performing in the classroom. In spite of a high self-evaluation for using learning media, it was concluded that in no case students have used modern technology including computer music programmes and MIDI environment.

S a ž e t a k

Rad nas upoznaje s uporabom nastavnih sredstava i pomagala i obrazovne tehnologije u nastavi glazbe. Namjena provedenog empirijskog istraživanja bila je proučiti upotrebu nastavnih sredstava i pomagala pri pripremi i izvedbi predavanja studenata iz glazbenog odgoja. Sudjelovalo je 105 studenata koji su pohađali 4. godinu studijskog smjera Razredne nastave na Pedagoškom fakultetu Sveučilišta u Mariboru, Slovenija. Rezultati su pokazali da studenti tijekom pripreme za poučavanje glazbe i tijekom same nastave većinom koriste tradicionalna nastavna sredstva i pomagala. Za izvođenja nastave najčešće koriste CD player i klavijature, a u pripremi nastave računalo, udžbenik, radnu bilježnicu, CD player i klavijature. Vrijeme uporabe sredstava i pomagala daleko je veći tijekom pripreme izvedbe nastavnog sata nego pri samoj izvedbi. Unatoč visokoj ocjeni svoje stručne osposobljenosti, ustanovljeno je da studenti ni u jednom primjeru nisu koristili suvremenu tehnologiju s računalnim glazbenim programima i MIDI okruženjem.

1. Introduction

The times when the songbooks were all we were using in music education classes are long gone. Teacher's skills in playing instruments do also not suffice on any educational level anymore. Rapid development of science and new technologies in the last century profoundly impacted music classes too. Music technology thrived with information and multimedia revolution, caused by computer technology. For a more successful teachers' preparation for the class and more efficient achievement of the music objectives the new didactic packages are composed of various printed contents together with CDs. Abroad there are quite often CD-rom editions designed for music lessons. In Slovenia there is still a lack in this area. In Slovenia most people when hearing about the usage of music technology associate it with the above mentioned media. In foreign literature however the inclusion of music technology in curricula most of the time means the usage of computers, music software equipment and electronic keyboards which all provide tools to help pupils at performing, improvising, composing, reading and writing music.

2. Learning media

Development of the contemporary information and communication technology (ICT) sparked development of modern education technology and learning media, which are more and more accessible to the school teachers. Yet the accessibility of the learning media does not guarantee that teachers will

use them successfully and frequently in education process. The usage of contemporary technology and learning media requires that a teacher: acquires knowledge and skills for learning media usage, is motivated for learning media usage, is acquainted with successful learning media usage, presents proper strategies for learning media usage to the pupils, is acquainted with various possibilities of learning media usage, follows development of contemporary learning media, provides proper didactic material, which is to be used in combination with learning media, is acquainted with new forms of learning and teaching methods which learning media usage enables i.e. requires, is acquainted with advantages, disadvantages and obstacles of learning media usage, provides all at school available multimedia, computer(s) and software, electric keyboards, etc.

When choosing the learning media which teacher will be using in class, he/she has to consider the channel for receiving the perception. Because pupils differ in ways in which they perceive impulses, the teacher has to apply various learning media, which through stimuli trigger different feelings. Blažič /**1**/ established that 76% of respondents of the representative sample of primary and secondary school teachers place a great emphasis on the factor *mode of pupils' perception*.

The usage of learning media is also important from the shaping of information and memory point of view. Sternberg /**2**/ cites traditional models of memory, where information is saved either in short-term memory or long-term memory.

Moreno /**3**/ proposes a cognitive theory of learning with media, which is based on the explicit learning assumptions.

In the research, made on a representative sample of 280 elementary and secondary school teachers, Blažič /**4**/ came between others to these conclusions:

- younger teachers rarely use learning media;
- audiovisual media are most frequently used by 47,7% of all the teachers, visual by 41,9%, auditory learning media by a tenth of all the teachers;
- 86% of all the teachers agree with the claim that *learning media enable faster and more quality knowledge gaining and that those media offer more opportunities for creative work accomplished by pupils.*

3. Learning media in music education class

By using contemporary learning media pupils are motivated easier and better because the usage itself often evokes curiosity, which enables a more successful transfer of music and music related content. Črčinovič Rozman emphasizes the importance of motivation for learning music and forming judgements about it. She says that "living with music does not begin with learning about forms of music but with evoking curiosity, which then leads us to question how music can enrich my life and experiences." /**5**/ Blažič states that "quality planed combined use of different media which are in the function of transferring knowledge contributes to better learning results" /**6**/. Burnard /**7**/ wrote that the questions: "who, why, how, when, where and what have to be answered by teacher when planning the use of learning media in class". Teacher must tend to choose the most suitable learning media which will have motivating influence on pupils, enable the teacher to present the content in best quality way and achieve targeted aims.

In class the usage of numerous auditive, visual and audiovisual media is possible. Recently the market increasingly offers accessible technology, which enables creation of multi media environment and MIDI (Musical Instruments Digital Interface) environment. In spite the fact that there are several musical computer software in the market, such as: Cubase, Cakewalk, Logic, Finale, Sibelius etc. there are several obstacles for their use in class: the schools do not have efficient enough and suitably equipped computer software, pupils' computer (il)literacy, professionally qualified elementary teachers, musical pupils' and teachers' (prior) knowledge. Daily pedagogical experience and work with students show that the majority of elementary teachers are not competent for more demanding work with modern music technology.

In foreign literature we find numerous examples of contemporary music technology usage, in recent time mostly computer supported multimedia is to be found. The situation in British primary schools, as presented by Naughton /**8**/ on education level from 1st to 3rd grade teachers have access to various programme equipment besides electric keyboards. That enables drill, composing and learning notation. Lango /**9**/ introduced an example of computer software Finale Note Pad use in music education class with 10-year old pupils. In two hours time the pupils consolidate and deepen their knowledge of music.

Computer supported systems enable creating an expressive performance without being able to play a musical instrument. It includes either a real time or recorded performance /**10**/. Seddon and O'Neill

/**11**/ evaluated computer-based compositions by children with and without prior experience of formal instrumental music tuition

4. Empirical research

4.1 Content division of the research

The youth nowadays learn about multimedia technology at a very early age at home as well as at the various levels of educational system. Because the number of the learning media and educational technology is on the increase, our empirical research was concerned with the frequency, time frame and professional skills for their use.

4.2 Methodology

Research method

We used a descriptive non-experimental method of empirical pedagogical research.

Research questions

We examined:

- which learning media are used by students when performing and preparing for a presentation in music education class;
- what is the average time of use of particular learning media during the performance and preparation for the presentation;
- what is the students' professional qualification self-evaluation for the use of various media in music education class;
- which learning media are accessible in classes.

Research hypotheses

H1: While realizing presentation in the music education class most of the students use at least one audio medium.

H2: While preparing presentation for the music education class the most frequently used learning medium is the computer.

H3: While preparing presentation in the music education class most of the students use the following learning media: student book and workbook, CD player and keyboard.

H4: Student book and workbook, CD player and keyboard are learning media, which are accessible in most departments.

H5: The average usage time of all the learning media is longer during preparing than realizing a presentation.

H6: Students evaluate their professional qualification for learning media usage with which they have worked during studying the Multimedia module as above average.

H7: Students evaluate their professional qualification for the learning media usage specific for musical field as above average.

Sample and collection of the data

There were 105 students participating in our research. They were all students of the fourth year in the academic year 2007/08 of university elementary teachers' programme at the Faculty of Education, Maribor. The polling was executed in January 2008.

Measurement instrument and data analysis

For the purposes of the research we produced a questionnaire with open and closed questions. The level of professional qualification was measured by means of five-level Likert scale.

The data were analyzed by SPSS. For the purposes of statistical analysis we used: f, f%, Mean (M), SD and t-test.

5. Results and interpretation

5.1 The use and accessibility of learning media in the realization of presentation

Tabel 1: The use and accessibility of some learning media in the realization of presentation

Learning medium	Realization of the presentation		Media accessibility	
	f	f%	F	f%
CD player	82	**78,1**	99	**94,3**
Keyboards	64	**61,0**	61	**58,1**
Rhythmic Orff Instruments	25	**23,8**	39	**37,1**
Student book, workbook	17	**16,2**	94	**89,5**
Computer	8	**7,6**	44	**41,9**
Melodic Orff Instrumens	6	**5,7**	20	**19,0**
Sound recording equipment	2	**1,9**	6	**5,7**
Television	1	**1,0**	50	**47,6**
DVD player	1	**1,0**	19	**18,1**

When executing the presentation in the music education lessons, the majority of students (78,1%) used a CD player, which was at the same time the most accessible learning medium in 94,3% of the classes. Nowadays we can hardly imagine teaching music without the help of a CD player. Established didactical packages on elementary level include CDs with sound recordings that elementary students and teachers use in the music education class.

Second most frequently used audio medium is keyboards, which were used by 61,0% of the students. Students use keyboards when introducing a song, for accompaniment and for intonation. The usage of keyboards is connected with the lesson subject. Keyboards are indispensable when learning a new song; however there are several activities where the keyboards are not necessary. One surprising piece of information discloses that keyboards are accessible only in 58,1% of the classes, which goes to show that the accessibility of such an important learning medium is too low. Keyboards should be at teacher's side at all times for usage as well as for practice. It would thus be necessary to research the connection between the accessibility of the keyboards and the frequency of its usage.

The third most frequently used learning medium is Orff instruments, which were used by merely a good fifth of the students. Creativity and accompaniment and other musical content on rhythmic Orff instruments calls for pupils' active participation. The experience shows that the use of rhythmic instruments has a very motivational impact upon students.

Only 16,2% of the students used student book and/or workbook. Students themselves have generally prepared various working material (working sheets, lyrics of the songs, pictorial material), which was presented and distributed to the pupils. 89,5% of students in the class had access to book and/or workbook.

The use of melodically Orff instruments is too low (5,7%). Sound recording devices were used by only 2 students, DVD player and television by only 1, eve though television was accessible in 47,6% of the classes. The reason for non-usage of television and DVD player probably lies in the absence of appropriate didactic tools.

The data obtained confirm our hypothesis, which claimed that the majority of students will use at least one audio medium when executing their presentation in music classes. The majority of students used at least two audio media, namely a CD player and keyboards. Based on the results we can also confirm the hypothesis that student book and workbook, CD player and keyboards are the learning media accessible in most of the classes.

5.2 The use of learning media in preparation for a presentation

Tabel 2: The use of some learning media in the preparation for a presentation

Learning media	Total	
	f	F%
Computer	103	**98,1**
Student book, workbook	86	**81,9**
CD player	82	**78,1**
Keyboards	63	**60,0**
Rhythmic Orff instruments	21	**20,0**
Sound recording equipment	5	**4,8**
Melodic Orff instruments	5	**4,8**
DVD player	2	**1,9**
Television	1	**1,0**
Video player	1	**1,0**

The data confirm our hypothesis, which claimed that while preparing for a presentation, the computer is the most frequently used learning medium. 98,1% of the students used it while preparing for a presentation. The computer was primarily used for writing their preparation that is why the high frequency of usage was expected.

The data also confirm our hypothesis, which claimed that more than half of the students will use student book and/or workbook, CD player and keyboards. In congruence with the teaching subject the student with the help of a teaching plan sets him/herself aims, which he/she will try to pursue through the teaching unit. The objectives are usually realized through mediation of the contents from accessible didactic packages, which contain student book and/or workbook or student book and sound material recorded on a CD. Students usually play through the included note transcript on keyboards (they learn how to play the keyboards for 3 years during their undergraduate education). This is why a high result regarding the usage of the previously mentioned learning media was expected. 81,9% of the students used student book and/or workbook, 78,1% CD player and 60,0% keyboards.

20% of the students used rhythmic Orff instruments while preparing for a presentation. It is evident from the data obtained that student rarely use other learning media when preparing for a presentation. The data regarding the frequency of use are similar to those that refer to the realization of the presentation.

5.3 Time of learning media usage when performing and preparing a presentation

Tabel 3: Time of learning media usage when performing and preparing a presentation

Learning medium	PERFORMING THE PRESENTATION Time of usage in min.		PREPARATION FOR THE PRESENTATION Time of usage in min.	
	Mean	SD	Mean	SD
CD player	10,33	7,624	21,30	21,988
Keyboards	8,03	4,797	70,48	66,337
Rhythmic Orff instruments	11,12	9,628	35,71	53,157
Student book, workbook	6,24	3,093	34,13	25,921
Computer	7,25	4,400	116,46	72,614
Melodic Orff instruments	16,83	16,558	30,00	18,708
Sound recording equipment	5,50	4,950	47,00	45,222
Television	3,00	.	30,00	.
DVD player	3,00	.	22,50	10,607

When performing presentation, students on average spent most of their time using melodic Orff instruments (M = 16,83) and rhythmic melodic instruments (M = 11,12). When using those two (groups of) learning media, the students are active performers, which as a consequence prolongates the usage time, especially due to repetition, giving instructions, correcting mistakes etc. The average time for the usage of CD player (M = 10,33) and keyboards (M = 8,03) is expected because playing one sound record or a song takes approximately 2 minutes (sometimes more, sometimes less), learning units are usually planned in a way that presupposes multiple listening or performances of a song. The average time of student book and/or workbook use (M = 6,24) usually reflects the time which teacher uses to explain the contents of graphic material in a student book or the time pupils need for solving a chore in workbook. With the rest of the learning media the average time of use was shorter and it approximately coincides with the time a teacher needs for onetime performance of the matter.

When preparing a presentation, students on average spent most of their time using a computer (M = 116,46), followed by the use of keyboards (M = 70, 48) and sound recording equipment (M = 47,00) (Tabel 3).

The results confirm our hypothesis, which claims that the average time of all learning media usage is longer when preparing for a presentation than when performing a presentation.

In the further analysis we searched for possible statistically significant differences in the average time of use of some of the learning media when performing and preparing a presentation. We came to the following conclusions:

- The average time of use of a CD player when performing a presentation (M = 10,41, SD = 7,688) is statistically significantly shorter (t = -5,001, g = 74, α = 0,000) from the average time of its use when preparing for a presentation (M = 22,24, SD = 22,568), which can be confirmed with less than 1 percent risk.

- The average time of use of the keyboards when performing a presentation (M = 8,26, SD = 4,883) is statistically significantly shorter (t= -7,95, g = 57, α = 0,000) from the average time of its use when preparing for a presentation (M = 67,93, SD = 56,615), which can be confirmed with less than 1 percent risk.

- The average time of use of a student book and workbook when performing a presentation (M = 6,24, SD = 3,093) is statistically significantly shorter (t = -3,987, g = 16, α = 0,001) from the average time of its use when preparing for a presentation (M = 43,82, SD = 39,549) which can be confirmed with less than 1 percent risk.

- The average time of use of melodic Orff instruments when performing a presentation (M = 19,2, SD = 17,341) is not statistically significantly shorter (t = -1,967; g = 4; α = 0,121) from the average time of its use when preparing for a presentation (M = 30, SD = 18,708).

- The average time of use of rhythmic Orff instruments when performing a presentation (M = 12, SD = 10,262) is not statistically significantly shorter (t = -2,067, g = 20, α = 0,052) from the average time of its use when preparing for a presentation (M = 35,71, SD = 53,157).

5.4 Students' professional qualification for the use of some learning media

Tabel 4: Students' professional qualification for the use of some learning media

Learning medium	Total	
	Mean	SD
1 CD player	4,78	0,519
2 Television	4,69	0,655
3 Student book, workbook	4,61	0,580
4 Computer	4,18	0,896
5 DVD player	4,16	0,833
6 Video player	4,07	0,824
7 Rhythmic Orff instruments	3,92	0,829
8 Melodic Orff instruments	3,75	0,875
9 Keyboards	3,72	0,976
10 Video camera	3,09	1,075
11 Sound recording equipmnet	2,91	1,039

The results confirm our hypothesis which claims that students estimate their professional qualification for the use of learning media with which they familiarized themselves in the Multimedia module as above average. Among these learning media students (with the help of five-level Likert scale) evaluate their professional qualification for the use of CD player the highest (M = 4,78), which is followed by television (M = 4,69), computer (M = 4,18), DVD player (M = 4,16), video player (M = 4,07). The use of video camera (M = 3,09) gained a low score, while the lowest score was with the use of sound recording devices (M = 2,91).

We can also confirm our hypothesis, which claims that students estimate their professional qualification for the learning media usage specific for music field as above average. From these learning media the highest estimation goes to possessing the professional qualification for the use of the student book and/or workbook (M = 4,61). Lower estimation of professional qualification regarding rhythmic Orff instruments (M = 3,92), melodic Orff instruments (M = 3,75) and keyboards (M = 3,72) imply that playing musical instruments and shaping music activities that include the use of musical instruments is indeed very demanding, from both the teacher's and the student's perspective.

6. Educational implications

The teachers should consider carefully the amount of musical technology they will use in their classes and for which purposes. Regarding the fact that the classes are much more efficient when pupils are active, it is good to take care of their active involvement. Electronic keyboards, music software, and computers are tools that can aid students in performing, improvising, composing, reading, and notating music. Music technology can heavily motivate pupils to learn the basic elements of music through creative activities, and accommodates the various levels of beginning students. The ideal music technology class allows student to: explore musical sound; improvise; create and record original sound; compose, notate, perform melodies and arrange melodies /**12**/.

7. Conclusion

A remarkably fast progress in the development of information and communication technology is causing an increasing availability of modern learning media. Although students are educated for their use during their studies, they do not apply gained knowledge and skills onto the music field. Regarding the fact that schools are well equipped with information technology this particular medium could be used for contemporary approaches and usage of all potentials it offers.

The presented research conclusions show that elementary students frequently use various learning media when preparing as well as when performing in class. It usually concerns the use of traditional learning media. We conclude that in order to improve musical-pedagogical work in the field of learning media usage in music classes on elementary level, it is necessary:

- to assure availability of learning media and encourage their frequent use,
- to adequately professionally educate teachers teaching on the elementary level as well as students for the learning media usage in music classes,
- to assure that multimedia material and computer (music) programme software are available and adapted for music lessons on the elementary level,
- to apply model cases of modern learning media usage and various contemporary information and communication technology usage from contemporary literature to everyday pedagogical practice.

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