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## SELECTION AND USE OF TEACHING AIDS AND TECHNOLOGIES IN CONTEMPORARY UNIVERSITY COURSES

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### SUMMARY

Contemporary university courses in the process of implementation of principles based on the Bologna Declaration is between traditional and contemporary paradigm of high education. Integrating of new valid forms is possible to actualize in readiness to change in relationships within academic community that still has intention of centralization in form but with no essence and purposefulness of educational work. Those changes happen in conceptions, goals and tasks, curriculums and programs, education of new teaching staff, organization and managing, financing and legal regulations and other segments streaming towards standardization and adaption of universities to needs of society and time with a special accent on creation of assumptions for continual lifetime education and professional development. In relation to this, methodic organization of teaching in which a special accent is put on teaching aids, didactic media and teaching technology is of existential value to sustainability of contemporary university courses. Results acquired through analytic descriptive method and survey method as a variant of analytic descriptive method and through apposite instruments for self evaluation of university teaching staff shows that contemporary university teaching is dominated by combining of teaching aids, that laptop and projector are dominant didactic media that characterize contemporary university courses.

**Key words:** didactic media and teaching technology, material and technical basis of teaching, teaching aids, university courses, high education.

### INTRODUCTION

Higher education nowadays is undergoing changes in its concept, objectives and tasks, curricula, training of new teachers, organization and management, financing, and legal regulations, as well as other segments in the direction of standardization and adjustment of universities to requirements of times and society. However, when it comes to organization of the teaching process, it is on the back burner or often completely ignored in the environment of reform and many changes. University teachers are aware of the fact that the teaching process should be slightly modified. At the same time, many of them do not change the concept of methodical organization of teaching and do not introduce innovations for the purpose of improvement of teaching process but are captured in traditional frameworks of methodical organization of the teaching process for several reasons that can be justified or not. The effect of these changes is unknown to some university teachers, some are not sufficiently trained, while the fact is still present that the reason for the presence of traditional methodological conceptions are also unsatisfactory material and technical conditions for the educational process in higher education institutions, which additionally complicates the reform process itself. There are small number of studies that deal with issues of university teaching and those dealing with the reform of higher

education, but only in terms of educational policy of higher education. Actual process of reform requires changes in innovative curricula, choice and innovation program content, as well as changing and adapting of methodology and modeling of teaching in university teaching.

### ***Material-technical base of university courses***

In the middle of the twentieth century the material-technical base of teaching was mentioned as an essential prerequisite for the quality of teaching and education at all levels. In the dictionary of Education (1967., 622), material-technical base of university courses are defined as "natural objects or constructed objects, models, instruments, graphic and other selected materials which can be used as a resource, help, encouragement or evidence in the process of learning, education and education. "Analyzing this definition, it could be concluded that the material-technical base of university courses represents a wide range of teaching resources and objects, with emphasis on pedagogical and didactic functions and roles determined by the basic goals and tasks of education, Poljak (1985., 54), material-technical basis and conditions for the classes defined as "the use of material-specific and spiritual which established the education process." Thus, the author emphasizes that the teaching process, the necessary technical conditions, not just an empty space. Filipović (1988., 112) the material-technical base of courses defined as "a set of facilities for teaching and resources for teaching collectives, groups and individuals." This definition ignores the teaching aids, teaching materials, etc., which are used daily in university teaching practice

Branković and Ilić (2003., 298) under the material-technical base of courses include "modern and functional educational facilities, technical equipment and supplies in the classroom, teaching aids and learning materials." This definition is more precise and more comprehensive, since it takes all the elements required for the teaching process. The process of higher education has to have its material equipment from the beginning to the end. The materials on which students base their education, can be classified into several groups: the original reality, instructional materials, teaching aids, technical devices and educational technology. The original reality is the broadest and the most precise source of knowledge and also the most suitable place for the development of work skills of the students. The original reality is exploited so that students come out of classrooms and into nature in order to the study it or that the pieces of original reality are brought to the classroom or laboratory. There are several ways to run classes in the original reality: the class is held outside the classroom; the entire instructional day is conducted outside the classroom; individual stages of the class are ran outside the classroom; half of daily activities are performed outside the classroom, and half of it inside the classroom.

### ***Teaching resources***

The original reality, courses resources, technical or teaching aids, technical devices and instructional technology are considered as material-technical basis for courses. According to Poljak (1985) courses resources are actually "didactically designed and reworked original reality", which compensate for the original objective reality, which is not always accessible due to geographical distances and its complexity. Teaching aids due didactic processing are more accessible to students as a source of knowledge and material for developing of their work skills. The same author classifies teaching resources to visual, auditory, audio-visual and textual.

*Visual teaching aids* have visible dimensions and they can be two-dimensional or three dimensional, and considering their didactic function they can be static (fixed) and dynamic (movable). Visual teaching aids are used as visual sources of knowledge. Two-dimensional static (fixed) teaching aids can be drawings, paintings, posters, maps, charts, filmstrips, etc., and dynamic (movable) could be applications, movies, television shows and the like.

The three-dimensional static (fixed) teaching aids could be collections, products, models, reliefs, etc., and dynamic (movable) models could be instruments, devices, puzzles, globe, planetarium, etc.

*Auditory teaching resources* serve as auditory sources of knowledge, for example, a variety of sound recordings of human or animal expression and natural sounds. An important auditory source of knowledge for all students is live word from their teachers that is manifested in usage of verbal teaching methods during the teaching process.

*Audio-visual aids* combine audio and video components. Typical audio-visual aids are sound movies and television shows in which the image is accompanied by appropriate sounds that emphasize the action taking place in the pictures.

*Text teaching resources* include a variety of text-based material that is used as a source of knowledge and as a material for spiritual work. It includes textbooks, texts, articles, encyclopedias, literary and scientific works. With regard to the issue and the subject of our research, in this paper, we use the aforementioned classifications during the test.

### ***Didactic media, technical and teaching aids***

According to Poljak (1985), "technical or teaching aids are tools for work," which include different tools that support the achievement of functional tasks of teaching. Related to this, it is necessary to distinguish between teaching materials and teaching aids, i.e. teaching resources as sources of knowledge or the objects of perception and teaching aids as a tools for work, although one and the same can be sometimes one and sometimes the other. Using teaching aids contributes to the development of work skills of students, which is associated with functional task of teaching. Various technical devices and mechanisms that are not even teaching means nor teaching aids, but also create a more favorable objective conditions for teaching and contribute to the greater efficiency of teaching, such as devices for water, gas, electricity, or mechanisms for lowering and raising the panels. Instructional technology as a technique has been designed to directly perform a didactic function teaching and learning, and to be more efficient and productive than the classic didactic function of teachers. This especially applies to multimedia technology with embedded educational content and specific didactic function of teaching and learning. On the other hand, it does not affect the function of the teacher, who assumes the role of the organizer of teaching technology, and the classic didactic triangle (teacher - student - content) is transformed into a rectangle didactic (teacher - student - content - technology). Also, concerning both didactic media and technology, modern didactic theorist Wolfgang Shulz defines them as concrete agents in understanding the teaching activities. According Shulz theory of teaching, the media are variously suitable for certain teaching methods, e.g. for a whole class or small group work, as well as control performance. The media does adjuvant for teaching communication. Language, mime, gesture, books, presentations on the board or a transparency and so they do, in fact, direct communication and understanding. He replaces teachers as lecturers, trainers, examiners. (Such as school shows on TV, computer software and programs for testing, etc.), which means it takes on a new quality (Gudjons, 1994., 52). Therefore, no one should be surprised that modern didactic literature is increasingly mentioned as didactic quadrilateral in which educational technology takes the place of the factors in the classroom along with student (student) teacher and subjects. Osmić and Tomić (2008) technical or teaching aids are defined as "tools for working with educational tools, or to work at all." Assistive devices, appliances, etc., which helps the use of teaching resources.

Poljak (1985) classifies one triangle, circle, square, stands, frames, dishes, burners, hammers, pliers, tweezers plate, screen, slide projector, tape recorder, radio, coffee, TV, microscope, projector, VCR, video an LCD screen in technical aids. Teaching aids are sources of knowledge, and teaching aids are activate those sources of knowledge in order to be accessible to our senses. Teaching tool is, for example, viewfoil and teaching aid is OHP. When it comes to *educational technology*, introducing computers initiated ideas on technology in the field of teaching in order to improve the overall education of each individual. Teaching techniques can be defined as the totality of all sources and aids which we use in the teaching process. Modern educational technology integrates contemporary designed learning program (software) and technology (hardware) through which the program becomes available to the student. The program integrates teaching materials, sources of knowledge - media that enable two-way communication

- interactivity, system tasks by which activity and a continuous stream of learning is encouraged and the instrument by which we evaluate program implementation. The highest level of educational technology is styling by using a computer.

The modern system of education demands computer literacy of all participants in the educational process. Curriculums can be on a CD, floppy disk, viewfoil, paper or online. The visualization can be supported by players, modems, scanners and LCD projectors. Benefits of educational technology are: the possibility of greater individualization in teaching, fast gathering of information, two-way communication, the rapid flow of information and updating classes, adoption of modern forms of teaching, adoption of teaching content at the pace that best suits the student.

Modern didactic theorist Felix von Cube, (according Gudjons, 1994., 67) classifies instructional technology and media serves to personal and non-personal (technical). Instructional media and educational technology is used in implementation of educational strategies. The media is personal if the teacher manages the learning process, and non-personal if the management of the educational process is related to technical holders. According to Cube's cybernetic-information teaching theory, the media are actually signs or sign systems that encode information. According to the above, Felix von Cube differs analogue and digital media, personal and technical, icons, symbols, diagrams and the like. Majority of the media used in the classroom (books, films, sets of photos, etc.) are curricular media and they represent completed finished and regulating units or parts of an already encoded educational strategy.

Kiryaku (1994) points out that the learner (student) learns 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they watch and listen, 70% of what they hear, watch and say, and 90% of what they hear, watch and say they made. Didactic value and benefits of different sources in the educational - teaching process, presents in the form of a pyramid of experience in the educational process, which include direct experience in the original reality (which are the primary sources), followed by experiences with objective reality and learning from books (didactic formed sources), and the top of the pyramid is occupied by symbolic experience (verbal and visual symbols).

## ISSUES AND TOPICS OF RESEARCH

It has long been known that the educational process, regardless of the level of institutional education is not just learning but it also involves managing and establishing interpersonal relationships between teachers and students, depending on the development of society, the normative legal, pedagogical and psychological and didactic learning and understanding. Didactics as a pedagogical discipline with its theoretical principles has always dealt with the issue of the relationship between factors of courses, but even today there are no comprehensive researched, theoretically assumed didactic and pedagogically analyzed university courses in didactic - methodical way. All the studies generally gave partial results and marks, mostly in terms of the reform of higher education policy, or in terms of the normative quality of higher education deriving from the Bologna Declaration, etc., without an analysis of the internal organization and methodical structure of the teaching process. The current issue of higher education is didactic determination of contemporary university courses in relation to its importance and position in contemporary didactic theories and teaching practice and it is the result of many years of dealing with reform policies of higher education in order to reach the European standard which is legally binding normative because it originates from the Bologna Declaration. Regarding to this, it is pedagogically and didactically questionable methodologically unrecognizable and the question that arises is what is that makes university teaching?!

The subject of our research is the selection and use of teaching aids and technical equipment in the contemporary university courses. Using the scientific and technical literature in the field of pedagogy and didactics, and conveniently using the appropriate instrument of research we want to determine which teaching resources are the most dominant in the contemporary university teaching by teachers at the University of Tuzla after the implementation of the Bologna concept of education.

### ***The importance of research***

Commitment to start the research of choice and use of teaching aids and technical aids in contemporary teaching practice at the University of Tuzla is motivated by the fact that the current problem was not completely and comprehensively researched previously and analyzed from a pedagogical and didactic aspects, and certainly not in the modern trends of development of pedagogical science and modern didactic theory. The reason for the detailed study of choice and use of teaching aids and technical aids in contemporary university courses practice originates from the actuality of higher education reform and the process of implementation of the Bologna concept of the education at the University of Tuzla. The known fact is that the improvement of the teaching process contributes to the overall quality of education, and, therefore, is the key to the success its didactic and methodical structure and its organizational elements. Actual changes in the world require some kind of infiltration into a democratic, pluralist and multicultural society, which requires openness and cooperation through joint teamwork, tolerance with respect to the different, the flexibility in correcting the same, and it is underlined by the declaration Bologna Declaration postulations. From what was stated above it can be concluded that our research problem has theoretical, practical and social significance.

The theoretical significance of the research is to shed light on the theoretical teaching resources and technical aids as important factors in the organization of a modern university teaching. Since the organization of the teaching process directly affects the quality of teaching it is important that teaching is designed according to the needs of participants in accordance with the available opportunities of higher education institutions. Good organization of teaching, systematic and gradual distribution of obligations specified by the curricula and the use of appropriate teaching aids and technical aids contribute to a sense of security and confidence in the quality of learning, the significant development of collaborative competencies and mutual understanding and respect in interpersonal relationships.

The practical significance of the study is reflected in the continuous analysis and improvement of the quality of the modern university teaching. Based on survey results, which are important for both teachers and students who will come to the knowledge of the teaching materials and technical aids such didactic elements that are used in modern university teaching, and will create insight into the state, as well as how and how much instructional materials and technical tools should be corrected, promoted and modernized to enhance the quality of university teaching. Research results will represent an indicator for taking concrete measures and procedures for practical action. Teachers will be able to analyze and judge their own work and methodical didactic organization of contemporary university teaching, competence in the organization of teaching, which is a kind of self-evaluation of teaching. Based on the results of this research, students as equal participants in higher education will be able to suggest changes to teachers in the didactic-methodical conception of the teaching process, in order to efficiently master program tasks, as well as creating conditions for collaborative learning.

The social significance and contribution of our research is reflected in ability to develop democratic and humane relations between students and teachers, who are socially conditioned and determined. The results of this study may contribute to taking appropriate actions to improve the non-institutional cooperation with the community for the purpose of efficient learning process and developing competencies necessary to mankind of the XXI century (Suzić, 2005). Development of science and technology on a daily basis creates the preconditions for learning faster and easier accessing to information, and universities must adapt to a more rational and more

efficient organization of educational activities through the implementation of the Bologna Declaration postulates. For the general public this study will be a great indicator that the University of Tuzla creates new prerequisites for improving and enhancing the quality of higher education every day which ultimately has a significant impact to the rating and competition among institutions of higher education.

### ***Research objective***

Given the importance of the research problem, the aim of the research is to examine the selection and use of teaching aids and technical aids as important teaching methodology elements of contemporary university courses through self-evaluation of the teaching staff at the University of Tuzla.

### ***Research Task***

Based on the operationalization of the goal, the task of the research is: To investigate the frequency of use and the use of teaching aids and technical aids in the teaching practice of contemporary university courses, what is the character and how its usage reflect to the quality of contemporary university teaching, and to determine whether their use varies depending on the age and sex of respondents with regard to scientific teaching and artistic distinction and groups of science the faculty belongs and consideration of work experience in higher education institutions.

### ***Main hypothesis***

It is assumed that there is a statistically significant difference in the frequency of use of certain teaching materials and technical equipment in the structure of the methodological organization of the contemporary university courses by teachers at the University of Tuzla.

### ***Sub-hypotheses***

In this study, the main hypothesis will be proved through the process of proving the following sub-hypotheses which is as it follows: It is assumed that the auditory teaching aids are the most dominant teaching assets in the structure of didactic methodical organization of contemporary university teaching and that laptop, OHP, TV, tape recorder are the most dominant teaching technologies (technical aids) in the structure of didactic and methodical organization of contemporary university courses, and that the modern university teaching with the mentioned technology has the character of an interactive collaborative teaching and reflects contemporary paradigm of higher education and that the modern university teaching with auditory teaching has the character of lecturing and a reflection of the traditional paradigm of higher education and that there are differences in the use of auditory teaching aids by teachers at the University of Tuzla, regarding to age, sex, educational scientific/artistic profession, years of experience in higher education, and groups of science to which the faculty belongs.

### ***Population and research sample***

The population of this research makes all the teaching and associate staff at the University of Tuzla (assistants, senior assistants, assistant professors, associate professors, full professors, emeriti professors). The sample used in research are the teachers and associates that belong to five groups of arts and sciences to include the 13 faculties and organizational units of the University of Tuzla, different gender, age, years of work experience in higher education and different scientific teaching profession. The sample was balanced with respect to the independent variable groupings of Sciences, consisting of 20 teachers and / or associate with any group of arts and sciences.

**Table 1.** The sample group according to science in which respondents work and sex

| <b>Science and Arts Groups</b>        | <b>F</b> | <b>%</b> | <b>Gender</b> | <b>F</b> | <b>%</b> |
|---------------------------------------|----------|----------|---------------|----------|----------|
| <b>Social Science</b>                 | 21       | 20,8     |               |          |          |
| <b>Physical Science</b>               | 20       | 19,8     | <b>Male</b>   | 51       | 50,5     |
| <b>Biomedical and health Sciences</b> | 20       | 19,8     |               |          |          |
| <b>Technical Sciences</b>             | 20       | 19,8     | <b>Female</b> | 50       | 49,5     |
| <b>Humanities</b>                     | 20       | 19,8     |               |          |          |
| <b>Total</b>                          | 101      | 100,0    | <b>Total</b>  | 101      | 100,0    |

Table 1 shows the sample of groups according to the science which the respondents have as a choice in the scientific teaching position and gender of respondents. The results show that the sample consists of 21 respondents (20.80%) with social sciences, 20 respondents (19.80%) with the physical sciences, 20 respondents (19.80%) with biomedical and health sciences, 20 respondents (19.80%) with the technical sciences, and 20 respondents (19.80%) with the humanities. Chi-square test, we determined that there was no significant difference in the frequency of subjects,  $\chi^2$  (df = 4) = 0.00,  $p > .05$ . with respect to the group of science in which teachers have a choice. Regarding the sample by gender at the University of Tuzla, the results show that it involved 51 respondents (50.5%) male and 50 (49.5%) female respondents. Using Chi-square test it was found that there was no statistically significant difference in the frequency of subjects,  $\chi^2$  (df = 1) = 0.00,  $p > .05$ . with regard to gender.

**Table 2.** Sample according to scientific courses positions and employment status at the University of Tuzla

| <b>Scientific courses position</b> | <b>F</b> | <b>%</b> | <b>Employment status</b> | <b>F</b> | <b>%</b> |
|------------------------------------|----------|----------|--------------------------|----------|----------|
| <b>Assistant</b>                   | 12       | 11,9     |                          |          |          |
| <b>Senior Assistant</b>            | 12       | 11,9     | <b>Associate</b>         | 20       | 19,8     |
| <b>Docent</b>                      | 38       | 37,6     |                          |          |          |
| <b>Associate Professor</b>         | 34       | 33,7     | <b>Employee</b>          | 81       | 80,2     |
| <b>Full Professor</b>              | 4        | 4,0      |                          |          |          |
| <b>Emeritus Professor</b>          | 1        | 1,0      |                          |          |          |
| <b>Total</b>                       | 101      | 100,0    | <b>Total</b>             | 101      | 100,0    |

Table 2 shows the pattern of respondents by scientific-courses positions and employment status at Tuzla University, and was found to be in this study were 12 patients (11.9%) as an assistant, 12 subjects (11.9%) in senior assistant, 38 subjects (37.6%), docent, 34 subjects (33.7%) as associate professor, four patients (4%) as a full professor and one respondent (1%) with the title of professor Emeritus. Chi-square test, we found that there were significant differences in the frequencies of respondents,  $\chi^2$  (df = 5) = 69.80,  $p < .05$ . with respect to scientific courses position, ie. most respondents took part in the scientific and educational docent. Also presented is a sample of respondents by employment status at the university, and found that 20 patients (19.8%) in the status of associates, and 81 respondents (80.2%) in the status of employees. Chi-square test, we found that there is a statistically significant difference in the frequency of subjects with regard to employment status,  $\chi^2$  (df = 1) = 38.44,  $p < .05$ , with significantly more respondents participated employees in relation to associates.

**Table 3.** Sample by age and years of experience in university courses of respondents

| Age            | F   | %     | Years of experience | F   | %     |
|----------------|-----|-------|---------------------|-----|-------|
| <b>20-30</b>   | 14  | 13,9  | <b>1-3</b>          | 15  | 14,9  |
| <b>30-40</b>   | 35  | 34,7  | <b>4-8</b>          | 24  | 23,8  |
| <b>40-50</b>   | 27  | 26,7  | <b>9-15</b>         | 41  | 40,6  |
| <b>50-60</b>   | 23  | 22,8  | <b>Over 15</b>      | 21  | 20,8  |
| <b>Over 60</b> | 2   | 2,0   | -                   | -   | -     |
| <b>Total</b>   | 101 | 100,0 | <b>Total</b>        | 101 | 100,0 |

Table 3 shows the sample of respondents by age and years of experience in higher education institutions. When sample of respondents by age group is questioned, it was found that 14 patients (13.9%) aged 20-30 years, 35 patients (34.7%) aged 30-40 years, 27 patients (26.7%), aged 40-50 years, 23 patients (22.8%) aged 50-60 years, while two respondents (2%) aged over 60 years. Chi-square test, we found that there were significant differences in the frequencies of respondents,  $\chi^2$  (df = 4) = 30.70,  $p < .05$ . with respect to age, ie. that most respondents participated in the age between 30 and 40 years. When it comes to sample according to years of experience in higher education institutions, it was found that 15 patients (14.9%) with an experience of one to three years, 24 patients (23.8%) with an experience of four to eight years, 41 respondents (40.6%) with an experience of nine to 15 years, while 21 respondents (20.8%) with an experience of over 15 years. Chi-square test, we found that there were significant differences in the frequencies of respondents,  $\chi^2$  (df = 3) = 15.04,  $p < .05$ . with respect to years of experience in higher education institutions, ie. that most respondents have 9-15 years experience in higher education institutions.

### ***Methods and research procedures***

In terms of methodology, this study is of transversal character at which analytical-descriptive and survey, as a variant of analytical and descriptive methods were used. Analytic-descriptive method is used in describing the terms didactic-methodical structure organized by the contemporary university teaching concerning the use and the use of teaching resources and instructional technology in the analysis and interpretation of research results, and in drawing conclusions and generalizations based on the obtained and analyzed the results. Analytical-descriptive method sought to reach out to the important connections and relationships teaching resources and technical aids in reflection of contemporary university teaching. Survey methods as a variant of analytical and descriptive method, which is a non-experimental research methods and has a very wide application, suitable for testing attitudes, opinions, views and perceptions about a problem, was used in the phase of collecting the data necessary for the realization of this research. According to Suzić (2001., 49) survey methods are used in studies in which the objects and phenomena in reality with the purpose to identify their important analytical or descriptive. Survey method is useful for testing large numbers of people in which all members of a group are tested or just selected representatives of a group defined by the research sample. Survey method as a form of field research is suitable to, with the help of certain instruments for data collection and analysis, determine the state, reveal certain tendencies, and to contribute to drawing conclusions about the general attitudes.

In order to come up with concrete data that is essential for our research problem, we used the methods of content analysis and interviews. Content analysis involves analyzing the pedagogical literature, and other written records. Sources and units of study are pedagogical and didactic works, monographs, scientific and professional articles and discussions, pedagogical dictionaries and encyclopedias, textbooks and manuals, which directly or indirectly deal with the issue of the organization of contemporary university teaching with special emphasis on the use of teaching aids and instructional technology. The process of interviewing was used in the phase of collecting data from respondents in writing. Thus, this method attempts to get information about self-evaluation methodological organization of contemporary university teaching concerning the



teaching materials and teaching methods, the contributions of the independent variables, as well as the quality which modern university instruction characteristic has considering the dominance of certain teaching resources and teaching technology. Therefore, the data was collected in a systematical and simple manner.

### ***Instruments, organisation and research flow***

In this study, two suitable research instruments are used as follows:

Questionnaire on socio demographic circumstances of respondents - using this questionnaire the data relating to all the independent variables of this study are to be collected, namely, age, gender, scientific and educational / artistic profession, years of experience in higher education institutions, and groups of science to which faculties belong.

SENUNTZ-VI / 9-13 - Survey questioner constructed for the purposes of this research. The instrument has six units divided into nine parts. The largest number of questions are designed in the form of Likert scale levels of agreement in which respondents expres their agreement with the above statements presented on a scale of one to five (always, often, sometimes, rarely, never), some questions are of multiple choice, and the last is the open question since it relates to suggestions of teachers related to improving didactic-methodic organization of contemporary university teaching.

Research of methodological organization with respect to the use of teaching aids and instructional technology in the contemporary university teaching was done at the University of Tuzla in 2013. Respondents answered on two instruments. Study was conducted in sessions of Scientific and Teaching Council at the University of Tuzla and due to insufficient sample collected in sessions, 20% of respondents were contacted electronically (via e-mail). It took about 20 minutes to use both instruments.

### ***Statistical data processing***

SPSS 21 software (Statistical Package of Social Sciences - for Windows) will be used for processing of the data obtained by using instruments. All variables were calculated by descriptive indicators.

## **ANALYSIS AND INTERPRETATION OF RESEARCH**

When it comes to teaching resources, the paper starts from the assumption that the auditory teaching aids are dominant in the structure of didactic and methodical organization of contemporary university teaching, that the laptop and projector, television, tape recorder and overhead projector are dominant teaching technology (technical aids) in methodological organization of contemporary university teaching structure and that modern university teaching together with the mentioned teaching technology has the character of an interactive collaborative teaching and reflects contemporary paradigm of higher education and that the contemporary university teaching with auditory teaching has the character of teaching and reflection of the traditional paradigm of higher education and that there are differences in the use of auditory teaching aids to teachers at the University of Tuzla, with respect to age, sex, educational scientific / artistic profession, years of experience in higher education, and groups of science to which the faculty belongs. Regarding to this, the frequency of use of all teaching materials used in the teaching process according to the classifications stated in the theoretical part of this work is analyzed as well as in Table 4 which showw the frequency of use in the contemporary university teaching.

**Table 4** Teaching resources by frequency of use (%)

| Teaching aids                         | Frequency of use of teaching aids |       |           |        |       |
|---------------------------------------|-----------------------------------|-------|-----------|--------|-------|
|                                       | Always                            | Often | Sometimes | Rarely | Never |
| Visual teaching aids                  | 30                                | 31    | 27        | 4      | 8     |
| Auditory teaching resources           | 31                                | 34    | 20        | 4      | 11    |
| Audio-visual teaching aids            | 13                                | 11    | 27        | 23     | 26    |
| Text teaching resources               | 36                                | 26    | 26        | 2      | 10    |
| Self thought teaching resources       | 25                                | 33    | 17        | 10     | 15    |
| The combination of teaching resources | 41                                | 41    | 12        | 1      | 5     |

Table 4 presents teaching resources according to frequency of use. From the results it can be seen that combining teaching aids is the most dominant by frequency of use taking into account that it is always or often used by 81% of respondents, than it is followed by auditory teaching resources with 65% frequency of use, followed by visual teaching aids with a 61% incidence, text teaching resources with 62% frequency, self thought teaching resources with 58% frequency of use, and audio-visual teaching aids with a 24% frequency of use. In order to determine whether or not auditory teaching aids are used significantly more often than other teaching tools the Wilcoxon test based on the test results of normal distribution (Kolmogorov-Smirnov test) was used which showed that the distribution of all the above scales are asymmetric. The result of that analysis is shown in Table 5.

**Table 5.** The results of the Wilcoxon test for the frequency of use of auditory teaching resources

|                                    | Z      | df | p    |
|------------------------------------|--------|----|------|
| Auditory T.R. - Visual T.A.        | -,133  | 99 | ,894 |
| Auditory T.R. - Audio-Visual T.A.  | -5,964 | 99 | ,000 |
| Auditory T.R. - Text T.R.          | ,293   | 99 | ,770 |
| Auditory T. R. - Self thought T.R. | -1,683 | 99 | ,092 |
| Auditory T.R. - Combining T.R.     | 2,619  | 99 | ,009 |

From the presented results it can be seen that there is no significant difference in the average frequency of use of auditory teaching resources in relation to visual teaching aids,  $Z (df = 99) = -0.133, p > .05$ . It was also found that there is a significant difference in the average frequency of use of auditory teaching resources in relation to audio-visual aids,  $Z (df = 99) = -5.964, p < .05$ , with the frequency of use of auditory teaching means lower average results (greater frequency of use). It was also found that there was no significant difference in the average frequency of use of auditory resources in relation to the text means,  $(df = 99) = -0.293, p > .05$ . We also found that there was no significant difference in the average frequency of use of audio means in relation to self thought asset  $Z (df = 99) = -1.683, p < .05$ , and that there is a significant difference in the frequency of use of auditory teaching resources in relation to combining teaching aids,  $Z (df = 99) = 2.619, p < .05$ , with the use of combined teaching aids lower average results (over used).

In order to determine whether there is a significant difference in the frequency of use of auditory teaching resources with regard to the age of teachers, sex, teaching and scientific / artistic profession, years of experience in higher education institutions, and groups of sciences to which faculty belongs, we used discriminant analysis.

**Table 6.** The results of discriminant analysis

| F | $\lambda$ | % variance | Cumulative % variance | $r_c$ | Wilks' $\lambda$ | $\chi^2$ | df | p    |
|---|-----------|------------|-----------------------|-------|------------------|----------|----|------|
| 1 | ,185      | 57,6       | 57,6                  | ,395  | ,740             | 28,294   | 20 | ,103 |
| 2 | ,093      | 28,8       | 86,4                  | ,291  | ,877             | 12,346   | 12 | ,418 |
| 3 | ,042      | 13,1       | 99,5                  | ,201  | ,958             | 4,023    | 6  | ,674 |
| 4 | ,002      | ,5         | 100,0                 | ,041  | ,998             | ,158     | 2  | ,924 |

As it can be seen from Table 6, there are no significant differences in socio-demographic variables with respect to the frequency of use of auditory teaching aids. It was established that there are four discriminant functions, which is consistent with the expected because the analysis involved five groups, the first resulting function explains 57.6% of intergroup variance, the second 28.8% of intergroup variance, the third 13.1% intergroup variance and the fourth 0,5% intergroup variance. Squared canonical correlation ( $r_c$ ) shows that the first discriminant function explains 15.60% of the variation within the grouping variable, or whether respondents belong to the group of respondents who always, often, sometimes, rarely or never used frontal form. Wilks'  $\lambda$  is the first discriminant function was high (Wilks'  $\lambda_1 = 0.740$ ) and indicates that the variables do not contribute significant amounts of prediction in distinguishing groups, or that the discriminative power of the discriminant function is small. From this indicator, we see 74% of the variance is not explained.  $\chi^2$  test is not significant for the function 1,  $\chi^2 = 28.294$ ,  $p < .05$ , which proved for other functions. This indicator demonstrates that the discriminative model is not significant, and that the variables are uncertain predictors of group membership based on the frequency of use of the method of exposure.

**Table 7.** Teaching technology according to frequency of use (%)

| Teaching Technology  | Frequency of use of teaching technology |       |           |        |       |
|----------------------|---|-------|-----------|--------|-------|
|                      | Always                                  | Often | Sometimes | Rarely | Never |
| Laptop and Projector | 41                                      | 41    | 13        | 3      | 2     |
| TV                   | 2                                       | 13    | 5         | 20     | 61    |
| Cassette player      | 19                                      | 3     | 8         | 10     | 61    |
| OHP                  | 40                                      | 10    | 15        | 1      | 35    |

Table 7 shows the educational technology by frequency of use. From the results it can be seen that the laptop and the projector are the most dominant by frequency of use, taking into account that they are always or often used by 81% of respondents, followed by an overhead projector, tape recorder and television.

## CONCLUSIONS

The pedagogical value of the results that have been reached is reflected in the findings that the in contemporary university teaching combining all the teaching resources dominates, which reduces the monotony in the practice of teaching to both students and teachers. Sources from which we draw instructional activities are diverse, and in line with modern teaching technology, and considering the material and technical conditions, the majority of teachers are trying to follow international standards of contents available in an interactive process of teaching and learning. Although the findings show that the most dominant is live word of teachers and students, which in the pedagogical sense is very important and praiseworthy in order to maintain live „face to face“ communication besides the danger that exists newer teaching technology in terms of technical aids in teaching and where all the values and skills needed to students and teacher are exchanged respecting the principles of teaching and they are not possible without live

words of participants of the teaching proces. Socio-emotional ties and interpersonal relationships that are built into the process of direct communication between students and teachers are important for the development of teamwork and cooperative learning. This highlights the point that the student and teacher are more important factors of education versus "dry" for courses in teaching and learning as well as teaching media and technical teaching aids. In this sense, we can say that the modern university teaching has the character of an interactive collaborative teaching and reflection of contemporary paradigm of higher education with tendencies to use modern teaching media and teaching technology and modern teaching aids, in order for the quality of teaching to satisfy primarily users of high education (students) but also participants that are part of it organization and realization.

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