

# THE PURPOSE OF TEACHING AIDS AND DIDACTIC TECHNOLOGY IN THE EDUCATIONAL PROCESS

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**Abstract:** A modern school is interested in improving the educational process, making it more effective and in bringing the learning closer to students, so that the school becomes interesting and attractive for them. Appropriate use of teaching aids, didactic techniques and modern information and communication technologies in education is one of the unforgettable factors in increasing the effectiveness of the learning process. These resources are highly motivational. They open a new path to knowledge for students, bring a wide range of tools for learning, and create an environment in which more effective, high-quality and engaging education is tailored to the needs and interests of students.

**Key words:** Educational process, teaching aids, didactic technique, teacher, students

## 1 Introduction

Educational process is complex and demanding. A teacher and a student enter into multilateral relations. It is a process of interaction, which can be understood as an interaction or an influence and a mutual view of two people, in which one leaves some information with the other (Gavora, 2007, p. 9). A teacher's personality influences a character and a quality of the relationship with students, determines the atmosphere in the classroom, stimulates or suppresses student's interest in the subject, their life in school, the development of their knowledge and the whole personality. A student's personality is a complex of psychological and physical qualities which allows them to flexibly adapt. A student, consciously or unconsciously, decides how much they let a teacher's personality influence them. As in all interpersonal relationships, both a teacher and a student influence the nature of their relationship.

A teacher and students participate in the educational process, which is specific, most important kind of education of children, youth and adults in schools. Teacher's activity - teaching is a process of managing students' cognitive and practical activities, managing the formation of their attitudes towards life, developing their abilities and their whole personality. Learning - students' activity - is a process in which students acquire knowledge, skills and habits, develop their abilities, shape their attitudes, relationship towards the world, life, environment, themselves, other people and so on (Turek, 2008).

A decisive element of the educational process are aims which require a certain state to be achieved. Teaching aims and objectives are specified in the curriculum, which is a system of knowledge and activities forming and developing students' personalities. Curriculum itself is static, it becomes dynamic only through interaction between a teacher and students, i.e. through methods, organizational forms and material means and, also the conditions in which it is implemented, have a great influence on the educational process.

From the above-mentioned analysis of the didactic system we want to point out and justify mainly the functions and requirements placed on teaching aids and didactic technique from the point of view where one of the most characteristic features of contemporary teaching are activity of students who are able to independently grasp the knowledge, and intensification of thinking in the educational process that requires the knowledge of the theoretical fundamentals and rational thinking in a particular area.

## 2 Characteristics of teaching aids and didactic techniques

Understanding of the place for teaching aids and didactic techniques in the educational process is most apparent if we imagine a teacher who is dependent solely on his speech. Although the word of a teacher is a very powerful means, its effect is limited. In the educational process, under the guidance of a teacher, students learn about the real world and its most varied forms. The result of this exploring is knowledge, skills and habits, attitudes, developed abilities and the whole personality of a student. However, all phenomena and facts cannot be made available only verbally, using description. Therefore, a teacher also uses means which "zoom in to what is far away, magnify what is tiny, reduce what is very large, slow down what is fast, accelerate what

is slow, discover what is hidden, they specify what is abstract, present what is long past, fix what is elusive, simplify what is too complex” (Cipro, 1977).

These means carry the curriculum and are called teaching aids. In some cases, teaching aids can only be applied through a variety of devices, machines and apparatus, which we call didactic technology.

Teaching aids have different definitions. According to Kožuchová (1998), these are didactic tools for managing the educational process and regulating learning itself. Obdržálek (1996) considers them to be means for a better and faster understanding of the subject matter. We find the most apt the definition of E. Petlák who defines teaching aids as means of illustrating teaching, enabling a faster and more complex learning of the subject matter (Petlák, 1997).

Thus, in the educational process, teaching aids have function of illustration, experience, activity, they motivate students and enable to link theoretical knowledge with practice. Through them, students get information faster which makes the learning process more dynamic and they create better prerequisites for activity in observation and thinking. By using them, a teacher can supplement the curriculum, use it at any stage of the educational process and use it to review the students’ knowledge. A computer is a good example. It is a technical device, a means designed to improve the educational process. It is used for reviewing and presenting of the topic, as well as for simulation and didactic games.

No modern school can function without them. They accept current technological advances, as well as extensive use of modern electronic components. In order to fulfill their educational function, teaching aids must meet a number of requirements, whether in relation to the content and methods of teaching, or in the technical, educational or security terms.

Based on the practice, as well as the literature of various authors, teaching aids can be divided into:

- real objects - tools, machines, products, nature elements,
- models - models of vehicles, construction machines,
- displays - images, sketches, diagrams, maps, photographs, book illustrations,
- auditory aids - gramophone recordings, tape recordings, CDs, radio shows,
- visual aids – film strips, slides, transparent background,
- audiovisual aids - films, video recordings, television programs, technical text - methodological manuals for teachers, worksheets for students, professional magazines, student magazines, encyclopaedias.
- Depending on which sensory organ they stimulate, we can classify teaching aids into:
- auditory - gramophone record, tape, radio,
- visual - real objects, models, different displays such as drawings, magazines, books, transparencies, photographs, textbooks and other study literature,
- tactile - realia, models,
- audiovisual - film, television, radio.

By didactic technology it is meant appropriately selected, modified and specially developed machines and equipment used for didactic purposes, mainly for the presentation of teaching aids and rationalizing the immediate management and control of students’ learning activities (Oberuč, Ušiak, Slávková, 2013). The didactic technique is not primarily influenced by the content of the teaching, as it is with teaching aids, but rather by the teaching aids which it enables to present. According to Friedmann, didactic techniques include (2001, p. 52):

- display screens - different types of boards, panels,
- projection screens - stable screens, portable screens, modified projection screens, e.g. white painting on the wall,
- projection technology - overhead projectors, slide projectors, data projectors,
- interactive boards,
- sound equipment - gramophone, tape recorders,
- audiovisual equipment - televisions, film projectors, cameras,
- teaching machines - informants, repetitors, simulators,
- computer equipment.
- Since teaching aids and didactic technology have an irreplaceable role in all stages of the educational process, we can distinguish between these functions:
- Informative function - it informs about relations, connections, it enables to understand the essence. On the other hand, it fulfills the function of a feedback, informs a student about their understanding of the curriculum, specifies the learning process, corrects ideas, knowledge and so on.

- Formative function - working with tools and technology, experimenting, comparing, it contributes to the development of creative activity and, at the same time, to the development of thought operations, to the formation of sensory and cognitive processes.
- Instrumental function - by using it, a student acquires knowledge, competences, skills and habits and, at the same time, creates prerequisites for further education.
- Motivational function - it arouses interest in the curriculum and learning, but only if a teacher works with the material resources properly and appropriately integrates them into the learning process.
- Systematic function - teaching aids and didactic techniques contribute to the creation and placing of the knowledge into a system.
- Visual function - it affects the senses, students get more specific ideas about what they are learning about.
- They are the source and bearer of information - a teacher's word is complemented by observation of objects and phenomena, which play an important role in acquiring new knowledge.
- Rational and economic function - it speeds up and facilitates the learning process.
- It facilitates the transition from theory to practice - a learner not only hears the words, but sees, manipulates with things.
- It supports self-study - a student, on the basis of observation, treats objects and devices, even during the time outside of the classroom.
- In short, the above-mentioned functions create the prerequisites for acquiring the curriculum in the shortest time possible, for improving and streamlining the educational process.
- Around the world, there is a constant search for ways to cope with the ever-increasing amount of knowledge which is needed to manage a particular work activity. And it is the teaching aids and didactic technology that are in a direct relation to the curriculum. They introduce its meaning and its goals, enhance the knowledge and understanding of the interrelationships between individual elements of the phenomenon or object displayed, help to develop logical thinking on the basis of visual representation of reality and ultimately contribute to the overall formation of a student's profile. In terms of their effectiveness, a teacher gains time which he can use to explain the curriculum in more depth and confirm the knowledge.
- It is also very important, as stated by Hlásna (Hlásna, 2006, p. 325), that "in order to create teaching aids with suitable characteristics and effectively incorporate them into the educational process, we need to know and respect certain requirements for the creation, selection and use of these teaching aids and didactic techniques."
- During the educational process, a student not only gains theoretical knowledge, but also acquires practical skills and habits. This understanding also respects the opinions of J. A. Komenský who promoted the idea of acquiring knowledge with all senses, including the work of a brain, language and hand. The acquiring of knowledge, skills and habits is dependent on teaching aids and didactic techniques which must form a coherent system, based on the objectives of the educational process, the curriculum, while respecting the teaching principles and methods of the educational process. If teaching aids are to help streamline the educational process, it is necessary to consider when, under what circumstances and which teaching aids will be used. It also needs to be considered in which stages of the educational process they are going to be used, to be appropriate and proportionate to the students' age and so that working with them will be safe.
- In teaching practice it happens that teachers sometimes have to create teaching aids themselves. When creating them, Turek (1987) recommends to respect the following requirements:
  - ergonomic - to take into account the general view and psycho-physiological peculiarities of a teacher and students, to respect the specificities of the content or their activities, to create optimal conditions and safety at work,
  - aesthetic - appropriate artistic composition and exterior design, developing healthy aesthetic taste in students,
  - technical - safety, reliability, durability, acquiring the basic knowledge about the structure, production technology, processing technologies and application possibilities of selected groups of progressive materials,
  - economical - affordable price while maintaining pedagogical efficiency and technical reliability.
- Teaching aids and didactic techniques allow a teacher to manage the educational process to ensure the feedback between a teacher and a student and vice versa is provided. Their use makes the educational process more interesting, it is not stereotypical, it activates students to work, which is reflected in an increased interest in education.

## 2.1 The use of teaching aids and didactic techniques in the educational process

Teaching aids are the means used in the educational process to illustrate teaching and enable a more complete, faster and more comprehensive learning. They should help to shape and form students' attitudes, their cognitive, communicative and creative abilities, to shape attitudes towards the world and the society. To develop the ability to learn rationally, solve problems and adapt to rapidly changing life conditions.

They agree with the curriculum and have an immediate relationship with it. They need to promote not only sensory perception but also intellectual cognition, so that they do not replace the verbal explanation of a teacher, but by their clarity help a student to acquire the ability to think and act creatively (Hrmo et al., 2005). The use of teaching aids and didactic techniques in the educational process is mainly related to the didactic principle of illustration. This principle was first justified and revised by J. A. Komenský who called it a golden rule for teachers:

"Everything should be presented to all of the senses as much as possible. And so, things visible to the eyes, audible to the ears, smelling to the nose, tasteful to the mouth and palpable to the touch, if something can be perceived by several senses at once, let it be presented to more senses." (Komenský, 1954).

Teaching aids and didactic techniques make it easier to understand the abstract elements of the curriculum, they contribute to the development of thinking, and can intensify a student's motivation. From these evaluations, we proceeded to research how teaching aids and didactic technology are used in the educational process. The aim of the research was to find out how teachers and students evaluate the quality of teaching, using teaching aids and didactic techniques. In the survey, we set out two exploratory tasks:

Teachers' views on teaching using teaching aids and didactic techniques.

Students' views on teaching using teaching aids and didactic techniques.

The subject of the survey were 14 secondary vocational schools, the sample consisted of 72 respondents - teachers from secondary vocational schools and 224 respondents - students of secondary vocational schools. For obtaining the data, we used the questionnaire and interview method.

## 2.2 Teachers' views on teaching using teaching aids and didactic techniques, resulting from the analysis

### 2.3 of the survey

From the analysis of the survey respondents conclude that the best results in teaching are achieved by students in subjects using teaching aids and didactic technology. At the same time, using the means of teaching must not be a goal in the classroom, but merely a means that help to achieve the teaching aims. Teaching aids arouse an interest in the curriculum and learning, diversify the educational process, but require proper processing and appropriate inclusion in the educational process.

Respondents conclude that teaching aids and didactic techniques affect the senses, give students more specific and comprehensive ideas about what they are learning, i.e. the learner does not only listen to words, but sees, hears, manipulates the objects. Teaching aids and didactic techniques make it easy to visualize real subjects, help to obtain clear and undistorted images, enable the involvement of more senses in the process of learning, and thereby help students to better understand the curriculum.

Respondents stated that it is practically unthinkable for the educational process to be absent of the teaching aids. They contribute to shaping and deepening of the ideas, to a more effective acquiring of knowledge, skills and competences and to shaping the characters of students.

Nevertheless, in their daily practice, respondents feel the lack of them. Often times, existing teaching aids are outdated, no longer functional, or do not reflect the current trends in teaching.

To the question of whether the attention of students can be attracted by using teaching aids and didactic techniques when explaining new curriculum, the respondents - the teachers clearly answered yes.

Specifically, in the theoretical subjects like Business Economics and Accounting and in a practical preparation in the subject of Economic Exercises and Accounting Exercises, as the most commonly used teaching aid is the real subject, respectively a model - 91.6%. From the teachers' point of view, this teaching aid is of a great importance for a better understanding of the curriculum and for clarifying the issue. Not in vain it is said - Better to see once than to hear a hundred times. The most important aspect of perception is sight, by which, in average, 83% of information is perceived. Auditory perception represents around 11% and the remaining 6% represents perception by touch, smell and taste. Educational and psychological research confirms that the effectiveness of perception and memory is directly dependent on the number of receptors that are activated during the learning process. The real objects are used, if their weight and size do not interfere with safe

handling. Models are used by teachers in the case of unavailability of real objects or when they need to emphasize only some of their parts.

The second most frequently used aid from the perspective of the respondents - the teachers is a PowerPoint presentation - 33.8%. A computer presentation consists of a series of slides into which images, animations, texts, graphs, tables are inserted. Presentations brighten up the lesson. The texts used are brief. Fonts and images large enough.

The third most frequently used teaching aid the respondents - the teachers presented were graphical representations, figures - 12.7%. These are mainly diagrams, forms, drawings. The advantage is that a teacher can easily and clearly explain what it would otherwise have to be described very complicated and in length by words.

At the end of the survey, the teachers answered an open question of which teaching aids would, in their opinion, improve and facilitate students' understanding of the new curriculum, they answered:

The teaching aids they have at their disposal are sufficient, but the number of them is not.

It would be perfect if there was an overhead projector, a visualizer and possibly a computer in each classroom, so that teachers could attract students' attention even more.

## 2.4 Students' views on teaching using teaching aids and didactic techniques

### 2.5 resulting from the analysis of the survey

The same opinion as respondents - the teachers - is shared by respondents - the students. As the interviews have shown, they consider teaching aids and didactic techniques to be a means of conveying or imitating the reality, helping them to illustrate it more easily, making it easier to understand the various problems and the abstract elements of the curriculum. These means not only provide them with clarity, but are often a source of knowledge.

We assume that it was for these reasons that the student respondents stated that, for them, the most comprehensible and easy to understand was the curriculum explained by means of a presentation, which was stated by up to 88.4% of respondents. They enjoy learning in this way. The speed of explanation by presentation is usually adequate, the text on each slide is readable.

In the second place, the respondents – the students, placed the use of real objects and models (70.5%), while 22.8% of respondents said that they did not find such a way of learning better and 6.7% said they do not even look at them.

The respondents – the students also have a very similar opinion on the use of pictures and animations from the perspective of a better understanding of the curriculum. From their point of view, these rank third in the effectiveness of learning, with 63.0%.

Interesting is also the opinion on using the textbook, which should be the most important explanatory aid of the curriculum, and the basic professional tool for students. The results of the survey show that respondents do not consider the textbook to be the source of information for students and teachers which sufficiently manages and stimulates students' learning. Sometimes they do not even understand the described text and its content is out of date. Only a few textbooks are issued with a methodical aid that explains the authors' intentions and recommends ways of working with the textbook. On the contrary, the curriculum is more comprehensible, understandable, clearer and easier to understand by means of presentation.

In the survey, the respondents – the students generally assessed that teaching aids and didactic technology contribute to the development of their personality and ways of their intensive learning. They are supported by thought operations, such as induction, deduction, analysis, synthesis, generalization and the like. Including teaching aids in the educational process increases the intensity of their work by making them work more individually and by helping them to develop their thinking and creativity.

## 2.6 Conclusion

The results of the survey convinced us that teachers, by using or not using teaching aids and didactic technique directly affect students' knowledge, their ability to understand the curriculum. All students learn differently. For some of them, it is enough to hear the information to remember it. For others, it is necessary to hold the object, to feel its shape and surface. Some students need to see things to remember them. And it is they who find teaching aids very useful.

It is therefore necessary to place an increasing emphasis on illustrating in the classroom. It is important that teaching aids are used at every stage of the educational process to fulfill all of their functions, to be versatile but also interesting for students.

Based on the results from our survey, to further improve the educational process, we suggest the following:  
To teach specialized subjects by using teaching aids, didactic techniques and modern information and communication technologies.

At least once a year determine the quality and effectiveness of teaching by using a survey.

To incorporate the use of teaching aids, modern didactic techniques and information and communication technologies in the educational documentation of the school or school facility, as a tool to enhance students' knowledge and the quality of school.

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