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Didactic and Educational Implications of Applying ICT in Homework Completion

Abstract

The article reveals diagnostic research findings which concerned the use of ICT in homework. The formulated conclusions involve capability of homework check if and to what degree it is copied from websites. Thus also becoming a reference point in future activities aimed at increasing homework.

Keywords: *homework, ICT, education, teacher*

Introduction

In the education systems of various countries, the assignment of homework has its own history and traditions. Homework itself varies in its function, the manner in which it is given, the evaluation criteria, and the consequences of students' failure to complete it. In addition to the countries where work is traditionally assigned to be completed at home, in some countries no homework is assigned, while in others homework is replaced by extra work conducted on school grounds outside of classes.

In the Polish education system, homework is perceived as an integral part of the didactic process and its completion is one of the basic duties of students.

The universality of possessing and using ICT, and especially access to the Internet, has resulted in this medium –relatively cheap, easy to use, within reach, containing vast amounts of information and being a wide-ranging tool of indirect, interpersonal communication – being used by students for completing different educational activities, homework being one of them.

On the one hand, the Internet has provided rich sources of knowledge, often used to aid the completion of homework; on the other hand, exploiting this medium has become a source of didactic and educational problems. These problems have to be solved by the teachers assigning homework, who must take care not only to ensure proper implementation, but also about having an impact on shaping their pupils' attitudes and values, especially honesty and responsibility.

Homework assignment and evaluation conditions

The nature of homework assignment depends on its goals. The goals are typically: acquisition of new material, consolidation of the acquired material, shaping skills and habits, and developing students' independence and creativity (Okoń, 2003, p. 331). These goals are related mostly to the didactic area. However, by choosing appropriate homework topics and the manner of assigning them as well as the student's independent work, and a correct method of evaluation, it is possible to show their educational impact (Musioł, 2007, p. 525).

Before making the decision of assigning homework, the teacher should conceptualize appropriate goals and estimate the chance of the student's successful and independent completion of it and, in some cases, even the costs of its completion.

When assigning homework, it is essential that the teacher does not just provide the homework and a short explanation. While performing didactic activities during classes, the student unable to understand instructions can ask the teacher questions, which is impossible when it comes to homework. Thus, the teacher assigning homework should make sure that all students correctly understand their intentions and expectations, as well as the sources that the teacher permits for the completion of the homework. Certain instructions should be emphasized to avoid confusion or doubt, such as: 'make use of the website www…', 'use the Internet' or 'please, do not use the Internet'. The exception to this is a situation when the teacher, following the Socratic dialogue (of master-student), apart from direct interaction, encourages indirect communication from pupils (Juszczyk, 2006, p. 36) with the use of ICT tools even in the event of difficulties with completing their homework.

In the process of evaluation of the student's homework, one can distinguish two interrelated activities: checking if the homework has been done and evaluating its quality. The process of evaluation is determined by the form of work: oral, written, manual, portfolio, practical or mixed (Śmietana, 2006, p. 793). In reality, completion of each of the given forms may be supported by information or material taken from the Internet.

The process of checking homework may include:

- Quantity – checking if all students, or a random group of students, have completed homework
- Quality – checking the correctness and independence of homework, either of one or several students,
- Mixed – checking if all or some students have completed their homework, and checking the quality of several students.

Punctual homework evaluation is one of the conditions of the teacher's appropriate didactic and educational work. The teacher's failure to do so results in students doing their homework irregularly or not at all. It then may happen that they get the lowest marks when the teacher "surprises" them with this evaluation.

Using ICT tools for homework

In kindergartens, where the development of ICT tool competency is realized, there is cooperation between teachers and parents, the result of which is that children consolidate the skills they gain in kindergarten while at home (Watoła, 2009, pp. 112–117). Such homework is assigned at schools that require the use of these tools, e.g. for information technology. When it comes to other subjects, there are two aspects to consider: these tools may in fact aid the student with completing their homework, but they may also be misused by, e.g., copying or sending homework.

Of all the ICT tools available at home that are suitable for completing homework, students most often use the Internet, searching for information or pre-prepared work and communicating with other students, either to consult them or to trade prepared materials. Often they do it by means of mobile appliances, such as smart phones, making calls, sending text messages (SMS) or photos (MMS) and making use of the above-mentioned Internet services (Huk, 2012, p. 191).

If students operate in the field of social media, they communicate, create and search for information there. This available form of media becomes a reason for the creation of a virtual community of students who take knowledge not only from the teacher – a 'master' – but also from each other. Making use of the opportunities given by these forms of media for didactic and educational goals has become a challenge for contemporary education (Frania, 2012, p. 88).

From the didactic and educational point of view, plagiarism – the ability to copy ready-made work or information, often without analyzing it, as well as sharing ready-made work electronically (files, photos of work, or scans) – is alarming.

To understand this phenomenon empirically, research with a diagnostic poll method and document analysis has been conducted. The methodological problems were as follows:

- What kind of homework is completed by means of ICT tools?
- What proportion of students makes use of ICT tools in the situations when the teacher allows for the use of all the possible sources of knowledge?
- What proportion of students makes use of ICT tools in the situations when the teacher allows students to make use of printed sources of knowledge only?
- Why do students copy homework from the Internet?
- What proportion of students has been punished because of copying homework from the Internet?
- What proportion of students communicates with each other in the matter of doing homework?
- What proportion of students makes use of ICT tools to send completed homework?

The poll has shown that in elementary school, information taken from the Internet or work publicized there are especially popular when it comes to doing homework from the humanities (Polish, foreign languages, history and society) and science, as homework in these subjects has most often the form of papers or essays.

The main reason for copying information from the Internet in the course of doing homework, as indicated by 44% of the surveyed students, was a desire for getting better marks. In the opinion of 31% of the surveyed, they devote too much time to learning, and making use of the websites containing information needed for doing homework is much easier for them. 15% of those surveyed claim that they do not believe in their skills, and using information from the Internet is a specific 'cure-all' for their low self-esteem.

14% of all the surveyed students said that they did not realize that copying information from the Internet and presenting it as their own was a crime and a lie.

A probable reason for such frequent copying of information from the Internet in homework is the tolerance of the practice by teachers and even a lack of response against highly evident signs of plagiarism, e.g. in the form of the website name apparent on the printed page, which is handed in to the teacher. Among the students admitting to having copied homework from the Internet, only 23% have been criticized for it by teachers. Moreover, the mark for completing homework is of low importance, thus students do not fear the consequences concerning the possible outcome.

In order to check the sources of information used by students while doing homework in the subjects: Polish, history and social studies, the analysis of work completed by parallel sixth-grade students of elementary schools has been made:

1. In the classes where the students should not use electronic sources while doing homework, the instruction said: "Write an essay on…using such sources as textbooks, books, and encyclopaedias, and edit it in a text editor."
2. In the classes where the students could use also electronic sources while doing homework, the instruction said: "Write an essay on… using all available knowledge sources, and edit it in a text editor."

To check the sources of information used by students, and to acknowledge if they make use of pre-done work, a demo version of one of the available anti-plagiarism applications was implemented, by means of which one could check documents of low volume in terms of similarity to texts accumulated in the system and in the Internet resources. The application gave information on the volume and source of borrowings, and showed it by giving the percentage value of the "probability factor".

In the classes where the students were supposed to do homework without using a computer and the Internet, 42% of the students did not comply with the instructions, copying extracts or the whole contents from websites. In turn, in the classes where the students could use information from all the possible sources of knowledge, 81% of the students copied homework from websites. The data of the results are juxtaposed in Table 1.

Table 1. Juxtaposition of the "probability factor" occurrence in the homework of students who were supposed to make use only of printed sources and in the homework of students who could use all the available sources of knowledge (N=229)

Convergence of contents of homework and contents of websites	Probability of use of () while completing homework		Total
	Printed sources only	All available sources of knowledge	
An instance of convergence of contents of homework and contents of websites	47	95	142
Lack of convergence of contents of homework and contents of websites	65	22	87
Total	112	117	229

Source: own poll

For Table 1 data:

$$\chi^2 = 37.388$$

For degrees of freedom:

$$df = (r - 1)\ (k - 1) = 1$$

and assumed statistical significance $\alpha = 0.05$, the theoretical critical value $\chi^2\alpha$ (array) for the test was:

$$\chi^2\alpha = 3.84$$

If:

$$\chi^2 \geq \chi^2\alpha$$

then there were grounds to reject the hypothesis of mutual independence of the examined features and to assume a new hypothesis of a relationship between them. The degree of convergence was:

$$c = 0.375 \text{ with } c_{max} = 0.707$$

The adjusted value of the convergence factor was:

$$c_{kor} = 0.53$$

and the correlation was:

$$r_c = 0.404$$

The strength of the relationship between the variables is low because it falls within the interval from 0.21 to 0.40 (J.P. Guilford, 1964, p. 157).

Even though there is a dependence between indicating the sources of knowledge possible to make use of while doing homework and the occurrence of the similarity of their contents to website contents, the phenomenon of not complying with the instruction of not using the Internet while doing homework by 42% of the students is undesirable, the occurrence of which teachers should effectively react against.

While examining the documents, the arithmetic means of the marks obtained by the students in the subjects: Polish, history and social studies, were calculated, and the juxtaposition of these means and the correspondence of homework contents with website contents was made. The juxtaposition is shown in Table 2.

Table 2. The arithmetic means obtained by students in the subjects: Polish, history and social studies, and the convergence of contents of homework with website contents (N=229)

The convergence of contents of the homework and contents of websites	Degree of arithmetic mean				Total
	Up to 3.0	from 3.1 to 4.0	from 4.1 to 5.0	Above 5.1	
An instance of convergence of contents of homework and contents of websites	8	79	55	0	142

The convergence of contents of the homework and contents of websites	Degree of arithmetic mean				Total
	Up to 3.0	from 3.1 to 4.0	from 4.1 to 5.0	Above 5.1	
The lack of convergence of contents of homework and contents of websites	2	36	44	5	87
Total	10	115	99	5	229

Source: own poll

For Table 2 data:

$$\chi^2 = 13.468$$

For degrees of freedom:

$$df = (r - 1)(k - 1) = 3$$

and assumed statistical significance $\alpha = 0.05$, the theoretical critical value $\chi^2\alpha$ (array) for the test was:

$$\chi^2\alpha = 7.82$$

If:

$$\chi^2 \geq \chi^2\alpha$$

Then there were grounds to reject the hypothesis of mutual independence of the examined features and to assume a new hypothesis of the relationship between them. The degree of correspondence was:

$$c = 0.236 \text{ with } c_{max} = 0.787$$

The correlated value of the correspondence factor was:

$$c_{kor} = 0.3$$

and the correlation was:

$$r_c = 0.243$$

The strength of the relationship between the variables is low because it falls within the interval from 0.21 to 0.40 (J.P. Guilford, 1964, p. 157).

Thus, the research has shown a greater tendency for copying work indiscriminately from the Internet by the students who have worse marks (with lower arithmetic means).

A lot of the analysed homework was done by the students by making compilations of text extracts from several websites. By making 'clicks' with a mouse, a stu-

dent goes through their contents, or rather titles, having the impression that he has all the knowledge contained in these hypertexts. Meanwhile, they get familiar only with a couple of catchwords and thus enter into the world of the "Xerox-culture". Mostly, students make use of a lot of chaotic and scattered "encyclopaedic" information, the result of which is that they do not possess a systematic knowledge. It has its implications at the further stages of education. Even in the work of the students of humanities, such as pedagogy, often one can come across a lot of information taken from the Internet, having no logical sequence – a so-called "information mosaic". In such work, between constituting paragraphs, there are discrepancies with regard to people, places or time. What is more, conversations with the authors of this homework prove that they lack the ability to perceive the information contained as a whole.

In order to reduce the occurrence of this mosaic among older pupils and students, we should shape their abilities in regard to using information from the Internet earlier, at the time when they start to use the Internet sources.

Using the Internet to send homework

By design, all work should be completed by students independently. There is nothing wrong if parents, older brothers or sisters, or friends help in doing homework, provided that this help is reduced to an essential minimum and they do not do the work instead of the student.

Completed homework copied by other students is undesirable. Not only does it fail to fulfil its assumed functions, but also it has to be treated as cheating. Copying (often called 'cribbing') of homework is an old and popular phenomenon in Poland. Unfortunately, ICT comes to the aid of rapid and often nervous copying of homework before classes. Completed work is sent in an electronic form by means of e-mail or other communicators. In turn, work done by hand in the traditional form is sent in the same way, after being scanned or photographed with a digital camera or phone.

In the polls conducted among the elementary school pupils, 29% of them admitted that they communicated with friends in order to complete homework. In the same polls, 19% of the students admitted to sending completed work.

Independence of homework completion is the most difficult criterion of evaluation, though not impossible. Most often, teachers pose questions concerning its completion, e.g. what the source of the given information is, why one applied this formula, how one has transformed it, etc.

Summary

Homework constitutes supplementation of the didactic activities conducted during classes. Proper assignment and evaluation of homework have desirable didactic and educational implications. The richness of information on the Internet and easy access to it results in students helping each other or copying it.

Teachers who mark students' homework should check if and to what degree it is copied from websites. They can do it:

In the case of homework handed in an electronic form (saved on different storage media or sent by e-mail) – by using applications that check documents for similarity to other texts accumulated in the system or in the Internet resources,

In the case of handwritten or printed homework – by getting familiar with several websites that appear prominently on the most popular search engines among students (as Google, Mozilla, Tlen) after entering key words from the homework.

In the case of printed homework – by paying attention to the printout features (e.g. easily seen website address).

Efficient and user-friendly anti-plagiarism software is commercial, thus schools or the administrative bodies should buy a license fee and provide all the employed teachers with the possibility of using it.

Moreover, keeping in mind the possibility of sharing all or parts of homework online, teachers may assign homework requiring different data, or even different instructions, depending on students' abilities.

The possibility of making a compilation of information obtained from several websites, which lack a logic sequence, and without making reflections on them, leads to the handing in of homework with an "information mosaic ", which can be one of the marking criteria for such homework.

In the era of students using the Internet to complete their work, going alone from the quantity evaluation of work to the quality one, or using a mixed one, becomes more important.

Using the Internet has become one of the most essential elements of two key abilities. The first being the ability to search for, select and use data, and the other one is the ability to receive and send text messages, by means of e-mail and Internet news feeds (Huk, 2008, p. 90). Thus, teachers should not battle against using the Internet to complete homework but rather express clearly which work should be done without using this medium, require the source of information, and condemn every confirmed case of dishonesty, then mark it according to the regulations of the in-school grading system.

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