Online Excursions

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***Abstract*— In this article we indicate our research results realized with the first year students of the Gymnasium in Bilíkova Street in Bratislava. The analysis of selected questions from questionnaires achieved that online excursions provided the students in the classroom with the opportunity to really identify with the activities performed by their classmates in the terrain, but especially with the opportunity to search for and process the information provided by the students in the terrain.**

I. Introduction

Digital technologies bring a revolutionary change in the way people search for, process, evaluate and use information. The extent and availability of knowledge of all scientific disciplines has been growing continuously especially due to them. This is also a reason why the ability to objectively assess their quality and actual benefits is becoming a key competence that is exceptionally highly appreciated in the students.

School excursions represent a special form of instruction, involving direct interaction of the students with the environment and linking acquired theoretical knowledge with the reality. Detailed information about rules in nature, live organisms, various forms of life or processes and phenomena happening on Earth for a long time must be adequately balanced with concrete examples from life. The instruction closed in classrooms is not able to give a sense of these and substitute personal experience from a visit of a described place. On the other hand, to think out carefully, prepare, plan and finally to realize the excursion successfully with the students requires a great deal of work from the teacher. The financial side of real excursions is also not insignificant. Online excursions represent an alternative to traditional school excursions. They represent the most modern way of multimedia presentation of scientifically proved information provided in a comprehensible form, using top-class digital technologies.

II. Applied Technological Solutions

A. Adobe Connect Pro Videoconference

Real-time interactive audiovisual communication is at present among the most popular forms of communication. This form of interaction is becoming an exceptionally attractive technology due to the minimum financial costs for the procurement of necessary equipment, increasingly better quality of Internet connection as well as flat rates regardless of the amount of transferred data. A videoconference in the Adobe Connect Pro program system is virtual programmer-predefined and web-oriented environment, interconnecting several participants in a videoconference room. At present, the number of participants is limited only by the nature of license, contents specialization, ability to manage and moderate discussions and technical capacities of connected devices (equipment). An inevitable condition for the videoconference realization is a good quality Internet connection and elementary audiovisual devices (digital camera or web camera, microphone, loudspeakers). The fluency of videoconference transmission can be currently ensured also by the 3.5G/HSDPA platform devices with activated mobile Internet services. In the videoconferencing environment, the properties of individual room connections can be set so as to optimize the exchange of information (quality of sound, video, shared applications) at the current speed of Internet connection. A good connectivity level is signaled by a green light in the upper right corner of the room. The system is especially well-arranged, easy to use and features a wide range of settings capable of individual graphical user interface adjustment to videoconferencing needs and focus. It has perfectly worked-out archiving of virtual sessions with automatic conversion of files created in the MS Office programs. In addition, it provides an opportunity to record and easily edit video records created from videoconferences. The system (it) is run using permanent URL addresses copied by a user to a dialog box of preferred search engine. Having entered the specified URL address, it is necessary to enter one's identification details (name, nick, etc.) in the box under the "Enter as a Guest" text and then clink on the "Enter Room" button.

B. LMS Claroline

Claroline information system is a special program intended for the creation of educational projects, lessons and online courses. It is free software, often labeled as Open Source developed in 2001 at the Catholic University of Louvain, Belgium. At present, the system (it) is used by educational institutions in over 80 countries of the world. Since anybody can use, freely copy and disseminate the software in the same or changed version and its source code is available, it is not necessary to spend any funds on its procurement. However, the installation, activation, ensuring availability on the Internet and administration require having a very good working knowledge of the MySQL database system, PHP programming script language and Apache web server. The information system in use is at present operated and freely available on a server of the Department of Didactics in Sciences, Psychology and Pedagogy at the Faculty of Natural Sciences of the Comenius University at the web site http://www.virtual-lab.sk/claroline/. LMS Claroline consists of two functionally different but interconnected interactive environments with a simple

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graphical user interface. There are two types of displaying corresponding to these platforms. The student type is intended for individual studies, while the teacher type is intended for the preparation and management of educational projects with interactive multimedia contents. The software is controlled using several tools taking into account the type of displaying. These are in the form of hypertext links and supplemented with several easily identifiable picture icons, whose main function is making work on projects faster and well-organized.

In order to enter the system, it is necessary to know a user name and password. In case that project authors decide to publish their educational contents, also users who have not signed in may view individual parts of prepared lessons. However, they cannot create and change projects, complete their answers, multimedia, propose solutions or test the level of their knowledge by completing exercises. Only registered users who have signed in for a project are allowed to decide about the contents and influence how the information system works. These users may access projects either as their administrators (authors, tutors) or students (solvers).

The creation of educational projects is done in simple and intuitive graphical environment (interface), where the function of tools is well-described by the names of hypertext links. These include:

Project description, including elementary information on the focus and educational objectives of project.

Schedule, including planned events.

Announcements, including information of unexpected changes, current affairs, planned software outages or other events intended for users and having impact on work on a project.

Documents and references, containing a list of information resources, web sites and study materials in various digital formats.

Exercises, intended for test creation and administration. An author chooses from five elementary formats of closed (objectively scorable) questions.

Procedures and instructions, proposing the optimum learning method when studying a particular educational project.

Assignments (tasks), by means of which students gain the insight of a problem area, search for right solutions and arrive at their own conclusions. Just like in other parts of the Claroline information system, an author is not limited by an exactly defined nature of assignment or formats of attached files. Therefore it is easy to attach pictures, animation, videos or audio recordings to individual tasks, taking advantage of the e-learning environment.

While the above stated tools for controlling the system are related mainly to the creation and contents specialization of educational projects, the purpose of other (Discussion, Groups, Users, Chat and Cooperation) is ensuring interconnection between individuals (registered users). The system actively supports teamwork (group of solvers), with the communication between its members taking place in the form of online chat or created discussion forum.

A special category of work tools positioned in the left-hand part of the Claroline information system window is represented by three hypertext links at its bottom margin. Using these tools, an author decides about elementary project features (Project settings) and accessible (active or visible) list of user tools. The Statistics part is of great importance to the project administrator (author). It maps access to individual parts of educational project by the registered users as well as anonymous users in a fast, well-arranged and statistically precise manner. The project author is capable of detailed continuous checking of registered students' work and reacting immediately to objective findings or possibly making further conclusions.

III. Research Objectives, Methods and Organization

The objective of research was to find out students' interest in and opinion on realized interdisciplinary online excursions as well as use of digital technologies in instruction with an emphasis on teamwork and problem solving.

We realized in-field excursions with the students in various localities of the Devínska Kobyla Protected Landscape Area, cultural and historical monument of the Devín Castle and the Bratislava ZOO. The excursions were namely the following: "From Sandberg to Devín", "From Dúbravka to the Devín Castle" and "The Bratislava ZOO or Bilíkova for Trstená". Before the realization of the excursions with the students, six trial excursions had taken place. The functioning and adequateness of digital technologies in use as well as signal coverage of the planned routes had been tested during these excursions, since the essence of the realization of the excursions was online communication and data exchange between the classroom and the terrain. Based on findings of the trial excursions, we revised planned stops and selected suitable locations supporting the idea of the interdisciplinary excursions.

During the realization of the excursions, the students were divided into 2 groups. One group stayed in the classroom, where they had at their disposal multimedia classroom and specialized literature. The other group moved to the terrain. Both groups were divided into smaller teams of 2 or 3 members, who had to communicate and cooperate between the groups as well as with the group in the classroom, while fulfilling their tasks. The teacher assigned the students in the classroom roles within the group (e.g. data collector, moderator, cameraman, etc.), taking into account the students' interests, their knowledge, skills and capabilities. While other students were moving to the terrain, the students in the classroom were solving the tasks assigned using LMS Claroline. Each group fulfilled a specific task during the excursion. At the same time, all students worked on achieving their common objective, hence the contribution of each of them was important in order to achieve the objective. Thus teamwork, cooperation and collaboration were important.

During the realization of the individual excursions, students in the classroom changed with those in the terrain. Their roles in the terrain changed as well.

The research used questionnaire method as a measuring tool. When drafting the questionnaires, we used mainly scaling questions of our own. We gave the questionnaires to the respondents before and after the realization of the excursion. The questionnaire before the excursion

contained mostly identical questions as the questionnaire after the excursion. The questions concerned students' interest in biology, excursion topic and use of digital technologies in instruction.

The questionnaire after the excursion contained also questions concerning the assessment of the excursion itself and working with LMS Claroline. The second part of the questionnaire consisted of a simplified version of MCQ (Multimedia Communication Questionnaire), a method of communication assessment via videoconference [1].

IV. Research Results

We realized the excursions with the first year students of the Gymnasium in Bilíkova Street in Bratislava (31 students – 9 boys, 22 girls). We analyzed the questionnaires concerning the realized excursions. In the following section, we present the results of the analysis of selected questions concerning increasing the quality of instruction process and students' motivation also by means of incorporating our form of instruction in the educational process.

When analyzing the data from the questionnaires administration, we were interested in students' interest in the excursion topic supported by digital technologies (DTs) after the excursion (Figure 1).

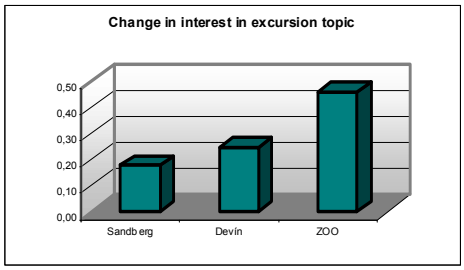

Figure 1 Comparison of the interest in the excursion topic supported by the digital technologies after the excursion.

The scale ranges from -1 to 1, with -1 meaning that students' interest decreased after the excursion. 0 means that the interest did not change and 1 means that the interest increased. As follows from the scheme, students' interest in the excursion topic increased commensurate to their participation in the excursions. The obtained results can be deemed as positive and the excursions supported by DTs as motivating the increase in students' interest in biology.

Since videoconferences are used in instruction in our country relatively rarely, we were interested in finding out students' interest in incorporating these in the educational process. We assessed the obtained data regardless of the placement into the groups and roles. The highest interest (73.32%) in incorporating the videoconferences in the instruction process was after the first excursion, which is understandable as the students participated in the above form of excursions for the first time and the experience they gained was new and interesting. After the second excursion, students' interest in incorporating the videoconferences in instruction decreased to 61.33%, which we do not see as a negative result, as the students participated in the excursion for the second time and the communication via videoconference did not seem to them so attractive as during the first excursion. In the course of this excursion, there were some problems with the picture and sound transmission in the locality, which might have resulted in the decreased students' interest to some degree. However, after the last excursion in the ZOO, students' interest in incorporating the videoconferences in instruction increased again to 66.92%. The increased interest had to do also with the excursion topic and the fact that working with the technologies had become a matter of course and the students could fully concentrate on the videoconference and instruction process.

We were also interested in finding out students' opinion on working in the Claroline information system. The assessment scale ranges from 1 to 5, with 1 meaning that working in the Claroline information system was insufficient and 5 meaning that working in the system was perfect. Working in the Claroline information system was assessed with the highest score (3.84) after the first excursion. The score of 3.84 means that working in the Claroline information system (IS) was for the students good or very good. They described the Claroline system as well-organized and relatively easy to use. Even though this was the first time that the students have worked with the system, they had no problems while completing the assignment and they learned fast how to work and orient in the system. After the second excursion, the score decreased by 0.47 to 3.37 which did not signify any marked change. The lower score could have been partly due to a higher number of assignments the students in the classroom had to solve in two hours, while the group in the terrain walked through the woods and had no signal. After the third excursion, the score of working in the system increased to 3.72, which again means good or very good score. In general, we can consider working in the Claroline IS as very good, with the system being well-organized and easy to use for the students.

During the overall analysis of the questionnaires from the individual excursions, we focused also on the scores concerning the change in the role and assignment of the students into the excursion groups as well as on comparing the interest in participation in another excursion (Schemes no. 2, 3, 4). We compared the scores between the students in the terrain and those in the classroom and between the genders. The results concerning the interest in changing the role and group and the interest in participation in another excursion range from –1 to 1, with the scores from –1 to 0 meaning disagreement to changing the role and group and a lack of interest in another excursion and the scores from 0 to 1 meaning agreement.

When comparing the scores concerning the interest in changing the role (Figure 2) within three realized excursions, we can see that all excursions in the terrain reached negative scores (Sandberg: -0.875, ZOO: -0.87, Devín: -1).

The score of -1 related to the Devín excursion means absolute disagreement to change students' roles, i.e. the students were fully satisfied with their roles. On the contrary, the scores of the students in the classroom were positive – Sandberg: 0.30, Devín: 0.14. In case of the ZOO excursion, the score was 0, meaning that the students were in essence satisfied with the roles they were assigned and some of them would have welcomed changing the roles during the excursion. If we were to examine in more

detail the interest in changing the roles between the genders, we would notice a decreasing tendency up to the negative scores in the students in the terrain. This result means that from the perspective of the attractiveness of the environment where the excursions were realized, the most interesting environment for the students was the Bratislava ZOO. Therefore the scores related to the ZOO excursion were -0.43 in the boys and 0.56 in the girls. Based on the obtained results, we can state that, regardless of the gender, the students were not much interested in changing the roles during the excursions. The result of the Sandberg excursion, where the score in the girls (0.09) was positive, could have been influenced by the fact that more of the girls were assigned the roles in the classroom and the outside environment presented via videoconference was interesting for them. However, we need to note that this was a lower positive score, which could be negligible in general.

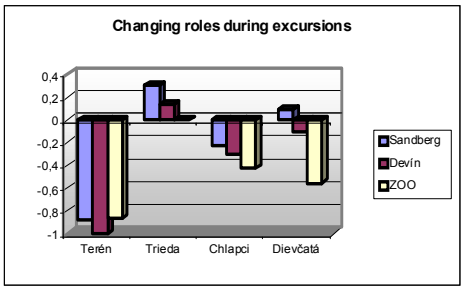

Figure 2 Comparison of the interest in changing the roles between the terrain and classroom and based on the gender within three realized Raft excursions.

Figure 3 illustrates the comparison of students' interest in changing the group from the terrain to the classroom and vice versa. The results are very similar to those in the previous scheme (Figure 2), since the assignment of the students to the roles and groups are closely interlinked.

In general, we can state that the students were satisfied with the groups and roles they were assigned. The selection and suitability of the assignment of the students to the groups and roles depended on the teacher who realized the excursion. This fact is confirmed by the above stated results of the questionnaire analysis, since the students were divided into the groups by the teacher based on their capabilities, knowledge and skills they used within the assigned roles during the excursion and videoconference.

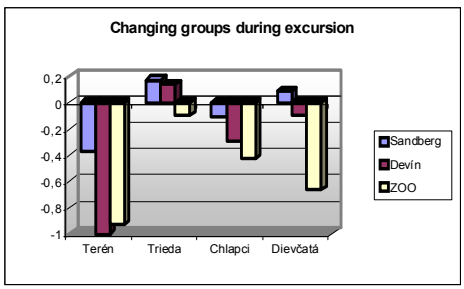

Figure 3 Comparison of the interest in changing the groups between the terrain and classroom and based on the gender within three realized Raft excursions.

Last but not least, by analyzing the questionnaire data, we wanted to find out students' interest in participating in another excursion. We assessed the data from the perspective of the assignment of the students to the terrain and classroom and from the perspective of the gender. Regardless of the gender and their assignment to the groups, all students were interested in participating in another excursion, which can be considered as a very positive result. It is notable that the scores of the interest of the students in the terrain decreased from the first excursion to the third one (Sandberg: 1, Devín: 1, ZOO: 0.73). This result could have been due to the fact that they realized the Bratislava ZOO or Bilíkova for Trstená excursion from the position of teachers for their younger schoolmates and they must have prepared for this in advance. On the contrary, the scores of the interest of the students in the classroom increased. After the last two excursions, the students in the classroom were slightly more interested in participating in another excursion (Sandberg: 0.43, Devín: 0.50, ZOO: 0.50). This result again confirmed the fact that for the students who participated in the last excursion in the roles of teachers the excursions did not seem as interesting as at the beginning.

The comparison of the interest by the gender is also notable. While in the boys, the interest in another excursion decreased from the first excursion to the third one (Sandberg: 0.56, Devín: 0.40, ZOO: 0.29), in the girls it increased (Sandberg: 0.59, Devín: 0.75, ZOO: 0.78). In general, the girls were more interested in the excursions than the boys. We assume that this result has to do with a higher information literacy and general interest in digital technologies in the boys.

V. Conclusion

As follows from the experience with using the digital technologies in the instruction process so far, online excursions provided the students in the classroom with the opportunity to really identify with the activities performed by their classmates in the terrain, but especially with the opportunity to search for and process the information provided by the students in the terrain. The also managed to meaningfully communicate and cooperate together when completing the assignments. However, a precondition for the effective cooperation of the students in the classroom and terrain is the necessity to be equipped with good quality modern technologies as well as wireless connection. In addition to obtaining new experience when working with the technologies, the students got acquainted with and learned how to work with the Claroline system, which, so to say, lead them to find the right solutions to their assignments by means of simple model task management. Working with the Claroline system is beneficial in several aspects for the students as well as teachers. It can provide them with interesting opportunities, procedures and instructions that are easily applicable in the instruction process. The students also learned how to lead the videoconference and how to behave in the process.

Thanks to the videoconference, the students could better imagine the environment their classmates in the terrain were in. They could ask specific questions concerning the assignments and thus participate in solving them. The videoconferences require quality hardware and software equipment as well as good transmission signal.

This fact may complicate the videoconference management. A negative aspect of the first two online excursions was the low quality signal, causing picture and especially sound interruptions during the videoconferences. Of course, this fact negatively impacted the overall impression of the videoconferences. In spite of that, as follows from the questionnaire analysis, it was interesting experience for the students and they would like to participate in this form of the instruction process more often.

ACKNOWLEDGEMENTS

We would like to thank all members of project teams who have contributed to the presented work, the result of the Slovak national projects Modernization of education at primary and secondary schools (ITMS project codes: 26110130083, 26140130013, 26110130084, 26140130014) supported by the European Social Fund.

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