Integration of mobile technologies and social networks into activation methods in education

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Abstract—Information and communication technology has the potential to transform the way people work together, access information, think and build new knowledge. The article presents new forms of mobile technologies and social networks usage in educational process. Authors focus on activation methods that can be enriched with these technologies. Presented methods have been experimentally verified and are based on the research which was realized at schools in the Czech Republic.

Keywords—activation methods, BYOD, mobile technologies, motivation, social networks.

I. INTRODUCTION

R ECENTLY, possibilities of mobile learning and collaborative learning have been increased due to evolution of mobile technologies and its market penetration through smartphones and tablets, but also due to high acceptance of these technologies among young people. Some characteristics such as social relationships or the mobile technologies and information and communication technologies have an important influence over human learning. Some researchers state this [1], [2] and they show a big interest in studying and researching how these new technologies can affect the teaching and learning process [3].

In terms of main 21st century competences, the competency of the ability to use technology interactively, has been classified and defined by OECD. OECD´s Education panel clearly defined the importance of ICT for the future generation life. They proposed "information dimension" which should be taken in account as one of the most important domain. Information and communication technology has the potential to transform the way people work together, access information, think and build new knowledge. Technology can be used interactively and beneficially if we understand its nature and reflect on its potential.

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Increasing pupils' motivation to learn is the constant problem in all types of education and age groups. The present time offers teachers a lot of options to increase the attractiveness of the education. If we combine proven educational methods with modern technologies, we can obtain good results: students might be more motivated and involved into educational process. Pupils enjoy education and acquire new skills with using modern technologies such as tablets and smartphones.

Activation methods are considered as very powerful tools for increasing motivation to learn. If we unite these methods with modern technology, effectiveness of education will increase and learning benefits become even more stable and permanent. (cf. [4], [5])

II. THEORETICAL BACKGROUND

A. Activation Methods

The activity can be understood as the mobilization of natural psychic powers, increased efforts, focusing on action. The teaching activity of students represents the formation of positive attitudes to learning themselves.

An active teaching method breaks the traditional stereotype of teaching, giving space for the creativity of teachers. The activation methods can be defined as "practices that lead teaching to achieve the educational goals based on their own teaching work of students, whereby the emphasis is on solving problems" [6]. These methods emphasize active participation of students in the classroom and direct involvement in teaching activities.

Generally speaking, activation methods require more energy and effort from teacher, but on the other side, teacher acquires important benefits: more motivated and involved students, who enjoy the education process. One of the big advantages of using activation methods is that teacher may also gain experience with pupils from different situations. Nevertheless, activation methods cannot replace traditional teaching in all cases. Sometimes it is more useful to use them as a complement to classical lessons (see Table I).

Table 1. Comparison of different teaching forms [7]

Comparison criterion	Forms of teaching		
	Classic education	Teaching with activation methods	Combination of both forms
Time required to prepare lessons	Low	High	Medium
Teaching aids	Low	High	Medium
Time required for implementation into the lesson	Low	High	Medium
Development of thinking, creativity	No	Yes	Yes
Increases the interest in the subject matter	No	Yes	Yes
Self-recognition	No	Yes	Yes
Changing relationships in the classroom	No	Yes	Yes
Space for students	No	Yes	Yes
Increases systematization	Yes	No	Yes

B. BYOD

If we decide to use modern technology and social networks in the classroom, in the first place we encounter small availability of these technologies in the school. This problem is partially smaller when teaching ICT, where at least a computer and access to the internet are at disposal. On the other hand, when teaching other subjects, the situation is worse. In spite of the fact that some schools have mobile classrooms with laptops or tablets, there is still insufficient number of devices very often. Furthermore, another problem can be either lack of coverage of the wifi signal or slow wifi network.

For instance, one possible solution is to ask pupils to use their own devices such as smartphones and tablets. This approach is commonly described as BYOD (bring your own device), or sometimes is also called BYOT (bring your own technology). As we found out in our research, the students have sufficiently powerful smartphones, often with connection to the internet. The combination of social networking and mobile technologies are very popular among the pupils. Therefore, we gain new opportunities in the lessons which might be also thought, thanks to technology, outside the classroom. To sum up, the use of social networking in education literally calls for the use of mobile technology.

Mobile devices offer a new opportunity for learning even in environments outside of school. Because they are truly personal tools, mobile devices enable continuous creation of personal learning environment (PLE). Mobil devices can enable to influence effectively content of education and they bring new opportunities in children´s learning.

Speaking about mobile learning, mLearning for short, we can simply describe it as a teaching method carried out on mobile devices. According to Cochrane [8] it is not "eLearning on tablets", but rather a way of teaching qualitatively and methodologically different from traditional eLearning.

According [6] and [9] mobile devices allow for better use of a broader portfolio of classroom forms of teaching and methods when compared to traditional eLearning. Included among these forms and methods are: tours in a museum, field work, research activities, didactic outdoor games, learning through life situations or group or cooperative learning (cf. [10]).

III. RESEARCH

A. Aims

The main objective of the research was to analyze which social networks are being used by young people, with the emphasis on the age group under the age of 13 years. Furthermore, we focused on the use of social networks among the University of Hradec Králové teachers and students-future teachers studying there. Our study was also aimed at specific differences in using social networks among selected age groups. We assumed that Facebook might bet the mostly used social networks across all age group.

Thus, the next aim of our research was to focus on the frequency of use and types of mobile devices, which respondents used for working with social networks. We concentrated mainly on smartphones and tablets thanks to the fact that we assumed that most users prefer work with social networks on some type of mobile device. However, we followed up the use of laptops and desktop computers as well. In case of smartphones and tablets, we payed attention to the possible accessibility of internet connection.

B. Methods

The Data was collected using a non-standardized electronic questionnaire with closed answers. The electronic questionnaire was created in Google Forms and contained terms of branching by age group of respondents. The questionnaire was optimized for use on mobile devices. The sample size which we wanted to target was at least 30 answering respondents from each age group. This goal of involving enough respondents was successfully achieved because the group with the least representation (age 30+) consisted of 35 respondents.

The content validity of the questionnaire was assessed by three independent experts from the area of psychology, informatics and pedagogy. The content of the test was based on the research [11], carried out broadly in the Czech Republic. The questionnaire reliability was assessed on the basis of the Cronbach alpha calculation ($\alpha = 0.78$).

C. Research sample

The research sample consisted of 807 respondents, consisting of pupils, students and teachers from Hradec Králové and the surrounding area. The amount of men and women was proportionally balanced: there were 51.2 % of women and 48.8 % of men in the research sample. Detailed distribution of respondents' age is presented in Fig. 1.
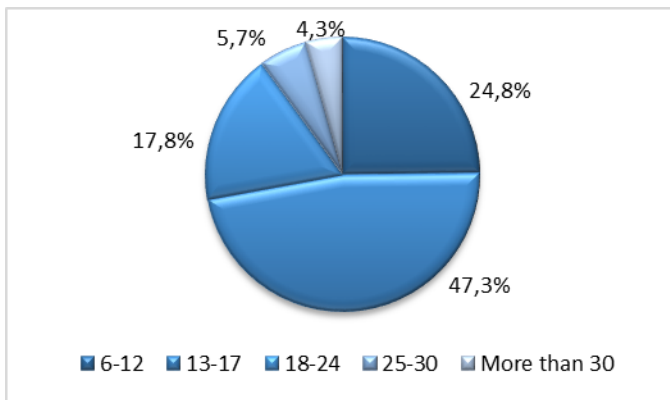
Fig. 1 Age distribution of respondents

For the sake of clarity and the fact that almost all social networks have a minimum age requirement of 13 years, the age of the respondents was divided into the following intervals: 6-12 years, 13-17 years, and 18 years and over (this category is referred to as 18+). Following research results are presented for those age categories.

D. Results

As we expected, the use of social networks is very intensive in all aforementioned age groups (see Fig. 2). More than 94 % of users in the age group from 13 to 17 years use at least one social network. The use of social networks in the age group 18+ is also very high (84.4 %), but this result is nothing unexpected and was predicted by researchers as well.

But the most surprising and alarming fact is that more than 75 % of respondents in age of 6 – 12 years use at least one social network. Moreover, this number might be in fact even higher because some children were afraid to confess in their responses that they are actively using some social network. We can clearly sum up that our results correspond with situation in other European countries [12] and are consistent with global research in the Czech Republic [11].
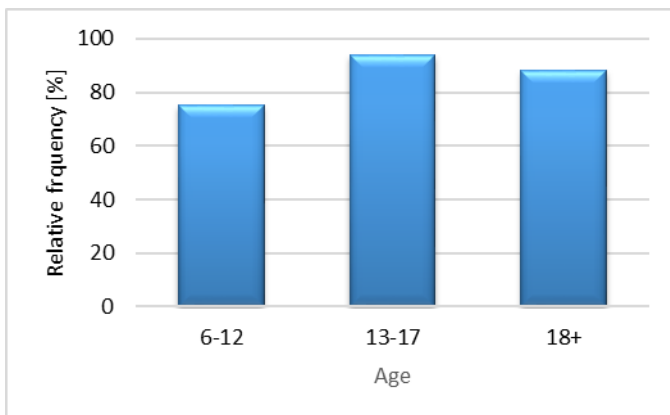

Fig. 2 Percentage of social networks' users in selected age groups

Majority of respondents use social networks more than one hour per day. Typical use of social networks is one to four hours a day (see Fig. 3). Although only relatively small amount of respondents reported that they use social networks more

than six hours a day, this number can be fairly higher: many users are connected almost all day on their mobile devices but they do not realize it and do not perceive this reality as being connected with social networks.
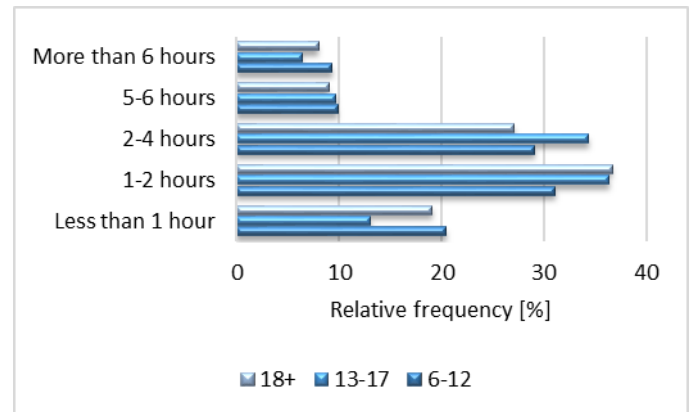

Fig. 3 Daily amount of time that users spend on social networks in selected age groups

Facebook is the most popular social network among all age groups. It is being followed by Instagram which has great popularity among all age groups as well (see Fig. 4). Due to our findings the high number of Facebook users younger than 13 years is caused by the fact that it is very easy to create "fake" profile with fictive age.
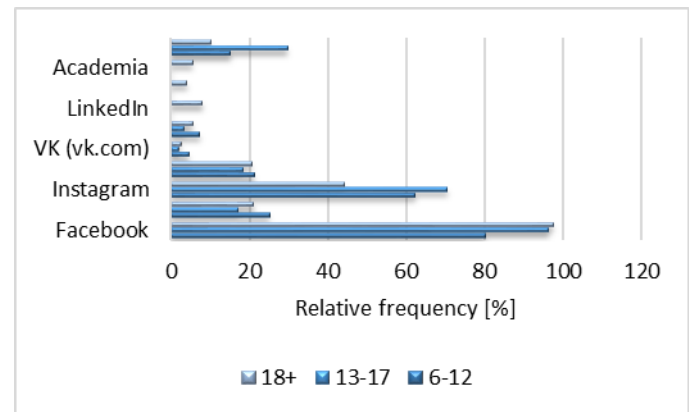

Fig. 4 Popularity of social networks in selected age groups

More than 80 % of users in all age groups use smartphone for being in touch with social networks. More than 40 % of respondents use tablets for being connected with social networks – that is significantly more than in other age groups (see Fig. 5).

More than 90 % of all respondents use WiFi connection to the internet on their mobile devices (see Fig. 6). In addition, more than 50 % of users in all age groups use data tariff. The number of data tariff users might be increasing in the future as mobile operators keep lowering the prices of data services.
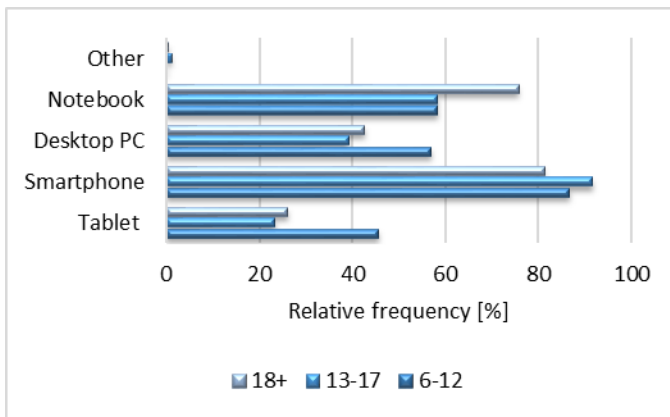
Fig. 5 Devices that respondents use for accessing social networks at school in selected age groups
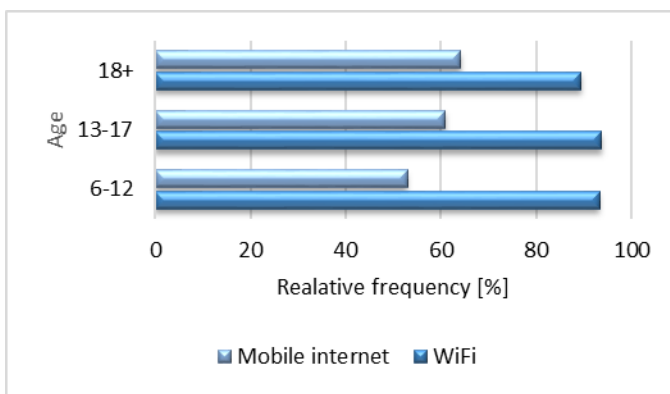

Fig. 6 Types of internet connection that respondents use on their mobile devices

Furthermore, we focused on particular reasons which might discourage others from using social networks. Naturally, reasons vary among all age groups. Concerning the age group 6-12 years the most referenced answer giving by respondents was "my parents forbid me to use social networks" while the users in the age group 13 – 17 years were mostly afraid of the fact that their parents could find their profile on a social network. Detailed distribution of answers is shown in Fig. 7.
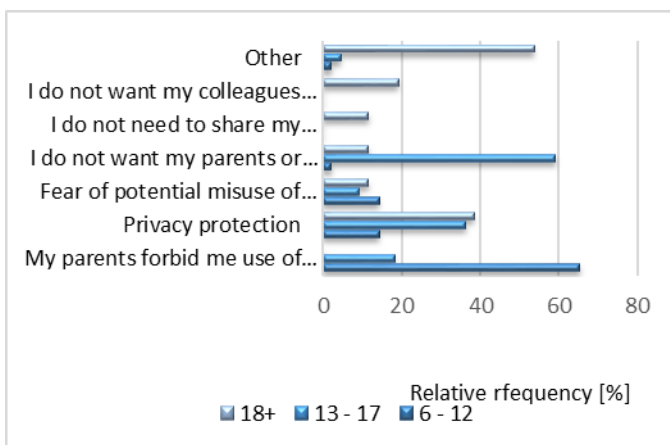

Fig. 7 Respondents' reasons for not using social networks in selected age groups

IV. EXAMPLES OF SELECTED ACTIVITIES

During the research, the authors have designed and tested a few of the activities that can be used in teaching and in educational process in primary and secondary schools. Selected activities using a combination of social networking and mobile technology are presented in the following text. The examples are illustrated on Facebook and Instagram social networks which represent the most popular networks among selected age groups.

A. Facebook Group

Facebook group represents a group where a teacher can serve as an administrator or moderator of the task or project. Pupils can publicly communicate and upload their contributions on the "timeline". Individual contributions are immediately displayed to the other members of the group. The other advantage is that others can react immediately after reading a post on the subject and contribute their opinions and suggestions at the same time. Next, users have the opportunity to communicate privately together when they decide. This is considered as useful choice for users who need to discuss a concrete post before publishing it to the group. Additionally, users can share pictures, charts, videos and make also comments on these files.

Example

In History lesson, teacher creates Facebook group "Charles IV, Holy Roman Emperor". The pupils are divided into groups of two or three. Each group of the pupils gets a single task: the life of Charles IV, the predecessors of Charles IV, foundation of Charles University, wife of Charles IV, children of Charles IV, etc. Each group of the pupils communicate between each other and comment on the individual's contributions. It is also enable them to share each of the links, where the information is found. The teacher is in the role of moderator who controls, corrects, motivates and checks entire project. The teacher sees the activity of all groups. That´s way both, the teacher and the pupils, can easily receive feedback which is beneficial for developing of working motivation and for goal achievement itself.

B. Polling in Facebook Group

Another option, that teacher might incorporate in their teaching process, is Facebook poll. The users might take advantage of commenting on everything and every group member sees how each poll point stands. Moreover, other tools which are available on Facebook might enable to involve and get students more active. For instance, users can upload a photo and let other users vote by expressing their own reactions, attitudes and opinions (Like, Love, Haha, Wow, Sad, and Angry).

Example

In Art education lesson, pupils create proposals of poster, school logo, photography on given topic etc. The pupils can take photographs with the help of mobile phone. Mobile phone enables them taking pictures of drawings and other types of hand-made materials as well. After taking picture and

publishing it into their created group, the pupils can discuss the images posted and vote for the best proposal. Such an activity is also suitable for involving pupils from other classes. Besides it teachers can organize a contest among pupils from different schools as well.

C. Facebook Page

Teacher can create Facebook page and add pupils as page moderators. The page can be created for specific classroom, topic or some particular event (school's trip, excursion etc.). After the page is created, it might be used even as communication platform for teachers, parents and public. It is convenient and efficient that the page can be accessible from the internet, without need to have Facebook account.

Example 1

Teacher creates (in cooperation with pupils) school or classroom page, where pupils, teachers and parents can follow the latest information about what is happening in the school. Users can discuss topics, offer cooperation and come up with different ideas on how to improve school life.

Example 2

Electronic reader's diary. The page can be used for discussion of read books, where pupils write a short review about books that they have read and recommend this book to others. The pupils may discuss peer-reviewed books and add likes or other reactions to book chosen. According to their reactions, everybody in the group can find out the level of popularity of the books. Despite pupil´s actual preferences the teacher can then initiate discussion about the best and worst rated book in lesson.

D. Instagram

According to the research results, Instagram is used mostly by younger pupils. Its main advantage is simplicity of use in general. Despite it does not have as many advanced option as Facebook it can be used fast and easily. Surely, this is one of the main reasons why Instagram is so popular among young children. Nevertheless, Instagram can only be fully used with mobile application and the web version is very limited. The application is available for Android, iOS, and Windows 10 Mobile. Instagram supports hashtags. The photo contains the time and place of acquisition, so teacher can use this information when checking published images.

Example

Searching for the oldest building in a town. In History lesson, pupils go out with their smartphones and take photos of old building in the town. They add hashtags (like #gothic, #baroque etc.) and texts from information tables. After adding a hashtag, the pupils watch the popularity of their photos and photos published by their classmates. The pupils receive an overview on how they stand. It motivates them to search for other buildings and to have appropriate competition. Pupils get acquainted with the architecture of the city and its history.

V. DISCUSSION

Technology related to teaching/learning plays a vital role in 21st century education [13]. (cf. e.g. [14], [15]). The needs to serve the learners become urgent to make learning activities more motivating, funny and engaging for the students who are continuously surrounded with every form of new technology [16].

Activating methods themselves can be very powerful tools for increasing students' motivation and their engagement into educational process. These methods may have also powerful and positive impact on attractiveness of learning.

If we combine them with mobile technology and social networks, we create and receive a strong and effective mix attitude and didactic methods, which can be interesting and helpful for both of group - students and teachers also. One of the keys for successful implementing these technologies into educational process is that they need to be easy to use and easily accessible and available for teachers and students. Both Facebook and Instagram are very easy to understand and users already have basic skills with interacting with them, even before they start to work with them at school. Tablets and smartphones are easily available because pupils and teachers already own them often and they also bring them to school every day. Of course, some technical problems with using own devices may appear. But in general, these disadvantages cannot beat advantages that we may gain from the use of activating methods and new technology. Using this new approaches for teaching means a teacher should handle new challenges of this creative and interactive way of education. It means they also need to know how use mobile technology and social networks in classroom in an efficient and safe way.

VI. CONCLUSION

Integration and incorporation of ICT, including of mobile technologies and social media, in education seems to be unavoidable. There is a constantly growing need of change in using of ICT. Furthermore, a question of use of ICT as means that can bring new benefits has already occurred a few last years. The goal of many professionals is how to use ICT not only as substitution for a textbook but how to enhance development of personal key competencies of students and how to support their active takeover of responsibility for their own education. Mobile technology and social networks are used by pupils extensively not only in leisure, but also in school. The combination of mobile devices and social networks can logically be used as suitable tool for making learning attractive and can caused increase of pupil's motivation.

As our research shows new activation methods might to enhance collaboration and cooperation among the pupils which might influence positively their learning outcomes. Some previous researches using computer-supported and collaborative learning have proved positive impact of this method on promoting of interaction, collaboration, help each other, motivation and interests in learning as well [17].

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