Analysis of Social Networks Usage among Students

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Abstract - This paper gives an insight into the implementation and results of the research on the habits and reasons for using social networks among students of the Faculty of Organization and Informatics in Varaždin. For the purpose of conducting the research, a survey questionnaire was created to examine the habits and reasons for using Facebook, Instagram and Twitter. Among other things, the use of social networks for academic purposes is examined. Data obtained through the survey over 14 days was meticulously analysed and a comparison of habits and reasons for the use was made between Facebook, Twitter and Instagram. An analysis of 217 survey responses showed which the most popular social network among college students was, which social network students used the most for academic use and for entertainment purposes. The analysis covered dependences on the number of friends and followers for three social networks.

Keywords - social networks; questionnaire; research; Facebook; Instagram; Twitter;

I. INTRODUCTION

New technologies have always been of interest to younger generations. Young people are more inclined to explore new things because they are more open minded and are more likely to accept and adapt to new technologies. The Internet as a technology has enabled the emergence of recently unimaginable products and services. Different ways of communicating that were not possible before have become a part of everyday life. People of all generations from all over the world interact with each other by exchanging text, image and video content. They often use some form of social software to communicate. Social networks are certainly the most popular social interaction form today, relying on the Internet and, more recently, mobile technologies. Social networks have become an integral part of the lives of not only the young but also the older generations over the last ten years. They are used for information, entertainment, communication with other users, but also as tools for education, business events, marketing and more.

In order to understand how the students of the Faculty of Organization and Informatics experience social networks today, a survey was conducted on their use of social networks. The research was conducted with a questionnaire on a sample of students of the Faculty of Organization and Informatics. The analysis of the research results will show to what extent, how and for what purposes students use social networks.

The rest of the paper is structured as follows: Section 2 describes related work and Section 3 presents research on using social networks among students. Section 4 presents data analysis and research results. Section 6 offers a conclusion.

II. RELATED WORK

Social networks and students as their users has been rather interesting area for research in last fifteen years. Many of them had focus on one of the most popular social networks platform/site Facebook and examine its relationship to formation and maintenance of social capital [1], its pedagogical potential [2], why students use it [3], privacy concerns [4], etc.

Spreading the potential of social networking to different media types results in popularity of other social networks platforms like Twitter, Instagram, and Snapchat, just to mention some of the most popular. There are many papers that were dealing with one of those social network platforms e.g. [5] motivation to use Instagram but here we prefer those researches that included at least three of them. Some authors [6] examined motivations and use of four social network platforms, other [7] bridging and bonding social capital, etc.

Salem and Mengyan [8] surveyed 363 students at Michigan State University in an online survey. They questioned the use of Facebook, Twitter, Instagram and Snapchat. The questions used in the survey are based on a 7-point Likert scale. Analysis of the results showed that students on average per day in minutes maximum use Instagram (108.73 min), followed by consecutive Snapchat (107.15 min), Facebook (106.35 min) and Twitter (88.92 min). Of all respondents, 97.2% have an account on Facebook, 79.1% on Twitter, and 87.1% on Instagram. The students responded to the "I use Facebook to share information" statement on a 7-point scale with an average of 4.00 (with a standard deviation of 1.67). They responded to the same statement, but related to Instagram, with an average of 4.00 (with a standard deviation of 1.81), related to Twitter 4.08 (with a standard deviation of 1.83). The result for the "I use Instagram to relax" statement for Facebook was 2.94 (with a standard deviation of 1.83), on Instagram 3.20 (with a standard deviation of 1.89), and on Twitter 2.94 (with a standard deviation of 1.82). The result for the "I use Instagram to meet new people" statement for Facebook was 2.94 (with a standard deviation of 1.83), on Instagram 3.20 (with a standard deviation of 1.89), and on Twitter 2.94 (with a standard deviation of 1.82). The result for the "I use Instagram to relax" statement for Facebook was 3.69 (with a standard deviation of 1.76), on Instagram 4.58 (with a standard deviation of 1.89).
deviation of 1.70), and on Twitter 3.78 (with a standard deviation of 1.80).

In their research, Karal and Kukoc [9] investigated the purposes of use and frequency of student population activity when using Facebook. Using the questionnaire method, 1818 students were examined at undergraduate (1190) and graduate (628) levels of education. Analysing the results, 79.2% of undergraduate students have 0 - 200 friends on Facebook, and similarly with graduate students, 73% of them have 0 - 200 friends on Facebook. In terms of daily time spent on Facebook, 42.1% of Facebook students use less than 30 minutes a day, 34% of Facebook students use 1 hour a day, 17.8% of Facebook students use 2 - 3 hours a day, and 6.1% of students use it 4 or more hours a day. Like the previous research, the Likert scale was used for some questions but this time 5-point scale. The students responded to the statement that they use Facebook to search for friends on average from a 2.00 to a 5-point scale (with a standard deviation of 0.82). For using Facebook for video and photo sharing, the average score was 2.73 (with a standard deviation of 0.83), for participating in group discussions 1.76 (with a standard deviation of 0.88), and for sharing study materials 2.04 (with a standard deviation of 0.88).

Tomljanović [10] analysed the impact of 2.0 tools in learning programming based on a survey conducted on 160 respondents. The survey covered various issues related to the use of social software and the Internet in general. 71.25% of survey respondents said they use Facebook. One of the aims of the research was to prove that the use of social software in learning has a positive effect on the achievement of learning outcomes and the mastery of programming materials. The students were divided into 2 groups. The first group was preparing for the second midterm exam in the classic way, and the second group was preparing using Web 2.0 tools, including Facebook. Everyone was preparing for the first midterm exam without using Web 2.0 tools. Analysis of the results showed that the second group significantly improved their score at the second midterm exam compared to the results from the first midterm exam. The first group of students didn't see progress in the second midterm exam.

Regarding the objective benefit of using social media to educate students, Faizi, El Afia and Chiheb [11] state that social media improves communication and interaction among students, as well as interaction between students and professors. Thanks to such platforms, students and professors communicate with each other during and outside classes. They also state how social networks help shy students share their ideas and express opinions without face-to-face communication. An additional advantage is the collection of works and ideas in one place where they can be worked on in groups.

III. RESEARCH ON USING SOCIAL NETWORKS AMONG STUDENTS

Today, students in the Republic of Croatia are on average between 19 and 24 years old, and most of them have already used some of social networks in elementary school. This makes them excellent candidates for research on the use of social networks at the university level. For the purpose of this paper at the Faculty of Organization and Informatics (hereinafter: FOI), students of FOI were selected as respondents.

A. Questionnaire

The questionnaire contains questions regarding the use of Facebook, Instagram and Twitter. Gupta and Bashir [12], in their work on a questionnaire related to the use of social networks among students, describe the development of a questionnaire of a total of 56 questions, which during the validation were reduced to 19 questions in the form of a 5-point Likert scale. According to the authors, four dimensions of the use of social networks are examined through questionnaire questions [12]: academic, socialization, entertainment, and informative. In addition to questions based on the 5-point Likert scale, the survey includes demographic questions about respondents, year of study, amount of time spent on individual activities on the social network, number of followers and friends on the social network, etc.

B. Method of data collecting

The survey was conducted among FOI students over a 14-day period (May 17, 2019 to May 31, 2019). The survey was created in the Google Forms tool and distributed to students via students' Facebook groups and FOI e-learning system (to inform students who are not using social networks or are not in the groups where the survey was published). Google Forms offers the ability to create dynamic surveys that greatly facilitate surveys. The questionnaire is designed dynamically so that questions are generated for each user separately depending on their answers to some key questions.

IV. DATA ANALYSIS AND RESEARCH RESULTS

During the 2 weeks of the survey, a total of 217 responses were collected. Of the total number of respondents, 54% were female students and 46% were male students. 58% of the students were students of the university undergraduate study programs in informatics, 20% of students were studying in the vocational undergraduate study program in informatics, 13% of students were students of university undergraduate study program Economics of Entrepreneurship, and the other 9% of students were in some of 5 graduate study programs. Most respondents, 46% of them, were at the time of the survey attending the 3rd year of the undergraduate study. 29% of respondents were from the 2nd year of undergraduate study, and 16% of respondents were from the 1st year of undergraduate study. 4% of students were in the 4th year and 5% of students were in the 2nd year of graduate studies. 44% of the respondents were 20 or 21 years old, which corresponds to a student of 2nd or 3rd year of study.

At the beginning of the survey on the use of each social network, the respondent was asked if he or she had an account on that social network, in the first place, in order to know whether to ask any further questions about the use of the same social network. Out of 217 respondents, only 4% of them had no Facebook account. As for Instagram, 23 of respondents did not have an
Table I shows the matrix of correlations between daily usage of Facebook, Instagram and Twitter on weekdays. On the main diagonal of the matrix, all the coefficients are 1.0. This is because the correlation is computed over two exactly the same variables among which the highest possible correlation is. The correlation coefficient between Facebook use on weekdays and Instagram on weekdays is 0.13, so we know that their connection is almost nonexistent. Comparing the correlation between Facebook and Twitter usage on weekdays, the correlation coefficient is -0.32. Such a correlation coefficient shows a weak correlation between the observed variables and its negative sign indicates a negative relationship between the variables. It can be interpreted that by reducing the daily use of Facebook among respondents, the use of Twitter was increased on weekdays. As for the link between using Twitter and Instagram, a correlation coefficient of 0.07 shows that there is almost no correlation between the two.

Table I: Matrix of correlations between daily Facebook usage, Instagram and Twitter on weekdays

<table>
<thead>
<tr>
<th>Facebook daily use on weekdays</th>
<th>Instagram daily use on weekdays</th>
<th>Twitter daily use on weekdays</th>
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<tbody>
<tr>
<td>1.00</td>
<td>0.13</td>
<td>-0.32</td>
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<tr>
<td>0.13</td>
<td>1.00</td>
<td>0.07</td>
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<td>-0.32</td>
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With only 19% of users among the students surveyed, Twitter was not nearly as popular as Facebook and Instagram. 25 respondents (61%), more than half of those who own a Twitter account did not use Twitter at all. It can be assumed that the users opened a Twitter account with the intention of using it, but it probably did not meet their expectations. Of those who used Twitter (39% of the total number of respondents who had a Twitter account), 5% of the total number of respondents with a Twitter account used it only on weekends. The top Twitter users spent between 1 and 2 hours a day on weekdays.

As for the use of social networks over the weekend, it is assumed that the number of hours of daily use will increase in relation to the use of weekdays. The results show that the time of daily use on weekends, with respondents using Facebook and on weekends, is higher than the use on weekdays. More respondents said that Facebook uses 2 to 3 hours on weekends, than 2 to 3 hours on weekdays. The number of respondents who used Facebook from 4 to 5 hours a day had also increased, and the number of those who spent more than 5 hours a day on Facebook was equal on weekends and weekdays. A similar situation was with Instagram and Twitter, where there was an increase in the weekend usage.

The survey asked respondents how much of the total hours they spent on Facebook (weekends or weekdays) playing games. 90% of respondents to this survey did not play games on Facebook. Of the respondents who played

Instagram account. Twitter was the least popular social network among FOI students, with only 19% of students among the respondents having an account.

Following the question of having an account on a particular social network, the students were asked how much time they spend on weekdays on Facebook, Instagram and Twitter, and how much on weekends. Of the 209 respondents who had a Facebook account, 2 did not use Facebook at all and 1 used it only during weekends. Of the respondents using Facebook, 25% answered that they only used Facebook for 11 to 30 minutes a day on weekdays, and 3% of respondents answered that they used Facebook for more than 5 hours a day on weekdays.

Of the 168 respondents who had an Instagram account, 5% of them did not use Instagram at all, a significantly higher number than on Facebook. As with Facebook, only 1 user did not use Instagram on weekdays. Although Instagram has fewer users than Facebook, Instagram was used more than Facebook over the week. Even 23% of respondents used Instagram 1-2 hours a day on weekdays, which is a significantly higher percentage than in comparison to Facebook for the same answer. The number of respondents who used Instagram for more than 5 hours a day (3% of respondents) is relatively similar to the number of users who spent more than 5 hours on Facebook. To make good comparisons of Facebook usage on weekdays with Instagram usage on weekdays, respondents' results on their usage should be displayed in the same graph. In order to create such a graph, the data to take into account must be from the respondents who used both social networks. The collected data on the use of social networks are in interval form, and numerical values are required to create a graph, so that the intervals are converted to arithmetic mean. Figure 1 shows the link between daily Facebook usage and Instagram usage on weekdays in minutes. The y axis shows the minutes of daily use on weekdays and the x axis represents respondents. It can be seen in the picture that the line representing Facebook usage is growing as it approaches the last user. This is because the data is sorted first by the Facebook usage and then by the Instagram usage. The data becomes useful when we read the graph in such a way that for each respondent on the x axis we look at how much Facebook uses and how much Instagram. The users who spent less time using Facebook spent more time with Instagram, while users who spent more time using Facebook spent less time with Instagram.
games, none spent more than 1 to 2 hours a day playing games (both on weekends and weekdays). Most gaming respondents spent up to 30 minutes a day on this activity. Men are more often associated with computer games today, so it would be interesting to examine the gender correlation of respondents with playing games on Facebook on weekdays and weekends. Figure 2 shows the number of gender respondents who played games on Facebook on weekdays. It is very interesting that female respondents who played games on Facebook spent more time each week on this activity than the male ones.

On weekends, the number of male respondents who play games was higher than on weekdays, but the female gender still prevailed in the time spent playing games, although there were more female respondents who did not play games on Facebook on weekends at all.

20% percent of Facebook respondents had between 501 and 1000 friends, and fewer (3%) had more than 1500 friends. Also, fewer people had up to 50 friends on Facebook (3%). Facebook offers the ability to follow people, in addition to friendship. The difference is that friendship requires confirmation from both users, while tracking does not. Instagram offers connectivity to users solely through monitoring. As noted above, user tracking does not have to be two-sided, so the number of people’s followers and the number of people they follow are usually different. The results show that, on average, respondents followed fewer people on Instagram than they had friends on Facebook. For a better understanding of the relationships between the variables of the number of friends on Facebook and the number of followers on Instagram, the scatter diagram shown in Figure 3 was made. A certain grouping of the respondents’ answers is visible and it can be said that there is a significant correlation between these two variables, that is, there is a positive dependence between them.

Figure 2: Number of respondents by sex who play games on Facebook weekdays

Figure 3: Scatter diagram of the number of friends on Facebook and the number of Instagram followers

Twitter was the least popular among respondents, which was probably one of the reasons why Twitter was the only social network (out of 3 social networks in this survey) for which several users replied that they did not follow anyone on Twitter and that no one was following them. From this, it can be concluded that Twitter may have “lost” these users at the very beginning of the use, even before searching for the people they wanted to follow. On the other hand, it is likely that these respondents did not follow any of the individuals, i.e. people, but followed some organizations, portals, websites, etc. Regarding the people who the respondents know personally outside Twitter, 44% of respondents knew no one outside of Twitter, 54% of respondents knew no one outside of Twitter, 54% of respondents knew no one outside of Twitter, 54% of respondents knew up to 10 people, and only 2% of respondents knew 11 to 50 people personally outside of Twitter. Only 8 respondents answered that they followed up to 10 FOI students on Twitter, and all others did not follow anyone from FOI.

Depending on the number of friends on Facebook, Facebook users are likely to have a certain number of minutes they spend on Facebook on weekdays. Someone with more friends may spend more time on Facebook because they have more information generated to process, and on the other hand, someone with a small number of friends may spend a lot of time on Facebook for other reasons, such as playing games or reading news. While it could be expected that there was a significant correlation between the values of the Facebook friends counts and the amount of Facebook daily usage time, the scatter diagram showing Figure 4 says the opposite. It shows that the data are not clustered at all, which concludes that the presumed connection does not exist.
Figure 4: Scatter diagram of the number of Facebook friends and the amount of Facebook daily use

Regarding the devices that the students used to access social networks, tablets were the least used to access Facebook because 91% of respondents answered that they did not use the tablet at all for Facebook access. Only 2% of respondents answered that the tablet was used more than 50% of the time. Smartphones were definitely leading the way in the use of Facebook access, and desktops and laptops were slightly less represented. Instagram was initially just a mobile app for smart mobile devices and there was no desktop version. Because of this, the first Instagram users only used mobile devices to access Instagram. Most people use only a smartphone to access Instagram. 57% of respondents answered that in 100% of cases Instagram was accessed via smartphone. Only 1 respondent (0.6 percent) answered that he/she used a desktop or laptop computer in 100% of cases. The frequency of tablet use was similar to that of Facebook.

Using the 5-point Likert scale for each social network, the respondents were asked 19 statements related to the use of social networks. The analysis of the answers once again confirms the poor use of Twitter among the respondents, because Twitter has the highest percentages of "Never" in all statements. The statements are divided into academic, socialization, fun and informative.

Most respondents used Facebook to solve various study problems. 81% percent of the respondents said that they never used Instagram for this purpose, and 98% of the respondents related to Twitter. The respondents mostly used Facebook, then Instagram, and Twitter was extremely under-represented. A large number of the respondents interacted with friends through social networks to prepare for the exam, and they most often used Facebook, and less often Instagram. The respondents almost never communicated with friends regarding exam preparation via Twitter. For group learning, the students most commonly used Facebook, for which they averaged 2.42 on a 5-point scale, slightly less Instagram (1.23) and Twitter (1.00).

Students are often stressed out by a large amount of study obligations, so they use social networks to relieve stress. According to the survey, Instagram was the first choice to help relieve the stress of FOI students (with an average response of 3.19), followed by Facebook (2.44) and Twitter (1.70). Instagram was also a leader among students in sharing pictures and watching video content.

The funny content of the people they are connected with is the most viewed by the respondents on Instagram.

When it comes to the informational dimension of using social networks, such as reading news and finding job related information, the respondents most commonly used Facebook. Interestingly, to share new ideas, the respondents liked to use Instagram a little more than Facebook.

Regarding the socialization dimension, the respondents most commonly used Instagram to become more social (average response is 2.18), followed by Facebook (2.06) and Twitter (1.49). Facebook also led the way with students who preferred to use the social network for social gathering. The results show that Instagram was ahead in the entertainment dimension, and Facebook in all other dimensions. Twitter was by all dimensions very underrepresented.

The number of the respondents' reactions to the statement "I use Facebook to ask for help from a professor" might be more interesting if we put it in the context of the year of study that the respondent was attending at the time. That relationship shows Figure 5. From the graph we can see that the help of professors was most often sought by students of the 1st and the 2nd year of the undergraduate study. It is possible that the cause of such a result was a lack of study-related experience among lower-level college students.

Some students consulted with colleagues through social media during exam preparation. The question is whether students from all study programs at FOI used Facebook equally to communicate with friends to prepare for the exam. Figure 6 shows the dependency of the study programs and reactions to the statement "I communicate with friends via Facebook for exam preparation". The graph shows that the students were happy to communicate with other colleagues regarding the preparation of exams, and this is mostly the study program of Information and Business Systems. According to the graph, the respondents studying for graduate studies (at all but Information and Software Engineering) all answered that they always or often communicated with friends via Facebook to prepare for the exam. The reason for this result is the very small number of respondents from these study programs (from 1 to 3 students, depending on the study program).
and Twitter by FOI students, a survey questionnaire was created to survey 217 FOI students over a 14-day period using Google Forms. Almost the same number of respondents of both sexes were surveyed, more than half of whom were undergraduate students in the Information and Business Systems program. Response analysis showed that Facebook was the most popular social network among survey students with more than 96% of respondents being Facebook users, while Instagram uses about 77% of them and Twitter is just under 19%. Surveyed students spent more time per day on weekends than weekdays, and interestingly, Instagram users spent more time on that social network per day than Facebook users using Facebook. Looking at the number of friends that respondents had on Facebook, the largest number, over 20%, had 501-1000 friends, while on Instagram, the number of people whose profiles followed the respondents was significantly smaller, so the largest group, more than 26%, was those who follow 101-200 profiles.

Facebook was also used by some students for academic purposes, and as a break from the study and stress it causes, FOI students most commonly used Instagram. The survey examined, among other things, the academic, socialization, entertainment and informational dimensions of social networking. Among students, Instagram is the leader in the entertainment dimension, and Facebook in all other dimensions.

Research conducted by Salem and Mengyan [8] showed that Instagram was the most used social network, not Facebook as was the case here. Twitter was also the least used social network in this research. The results partially match the statement about using the social network for stress relief. Both studies showed that Instagram was ahead in its use for stress relief purposes. However, the results of a survey conducted by Salem and Mengyan show that Twitter was right behind Instagram by use for stress relief; and in this research, the results show that it is the least used for these purposes. In terms of responding to the statement about using social networks to become more social and meet new people, both studies confirmed that Instagram was the most used for these purposes. In this research, Twitter was in the last place, and in the research conducted by Salem and Mengyan, Twitter and Facebook are used equally for the purpose of meeting new people.

Looking at the number of friends that the respondents have on Facebook, the largest number, over 20%, have 501-1000 friends and only 8% of respondents have less than 200 friends. Karal and Kukoc [9] found in their research that 79% of the undergraduate respondents had 0-200 friends on Facebook, which is significantly less than in this survey. One of the main reasons must be the earlier stage of social networks usage in the year 2012 which was 7 years before this research.

In his paper on the impact of 2.0 tools in programming learning, Tomljanović [10] shows how social software has a positive impact on learning and on learning outcomes. In this paper, the average response to the statement about using the social networking site Facebook for group learning is on a 5-point scale of 2.42. We can assume that students use social networks even more for independent learning. This confirms that students are aware of the benefits of using social networks for learning purposes and that is why they use it.

REFERENCES