Correlation between motivation, self-evaluation and ICT knowledge among students of different nationalities

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Abstract: Students enter the university studies with different levels of motivation. As described by the theory of self-determination, they can be either intrinsically or extrinsically motivated or amotivated. In our research we wanted to find out the differences in motivation between full-time and part-time students. The research was conducted on students from different fields of studies and different countries. The results show that the students are mostly extrinsically motivated. There are no significant differences in gender considering studying motivation, so we can assume that the studying motivation is equally represented in males and females. The students of arts and humanities studies are more intrinsically motivated than students of science and technology studies. Part-time students have shown a higher level of extrinsic motivation. Considering the country of residence, the students living in countries outside the European Union are more intrinsically motivated for learning studying.

The analysis of differences in students' self-evaluation compared to real knowledge of software and hardware has shown significant difference between students in gender and origin of living. Students of arts and humanities studies and full-time students have shown more knowledge of software and hardware and they are also more motivated to educate themselves than students of science and technology studies.

Comparing real knowledge with motivation to study we recognised that intrinsic motivation has a statistically relevant influence on the real knowledge. By raising intrinsic motivation we could also increase real knowledge.

A motivation also has statistically relevant influence on the real knowledge. By raising amotivation one could decrease the real knowledge.

Key words: intrinsic motivation; extrinsic motivation; amotivation; self-evaluation; real knowledge; ICT
Introduction

Due to fast technological development, globalisation process and new ways of communication, the ICT (Information and Communication Technology) is subjected to rapid changes. If we want to be successful and up-to-date with ICT changes, we have to educate ourselves and improve our knowledge and skills. Not just because of our work, but also for our personal development and for quality of life in the society. That is the reason why education is one of the basic sources for acquisition of new knowledge, skills and abilities.

In the past years ICT in education educational technology has made a huge progress – in software as well as in hardware. Since the informational proficient graduates have to know how to use ICT these topics have to be a part of education.

Motivational questions in education continuously occupy numerous experts. If a person cannot see education as means to achieve his goals, then it is not educationally motivated. The motivation leads an individual to reach the set goals and affects how they work and react in a certain situation. Even the abilities of an individual are often not enough to reach set goals if they are not motivated.

The self-determination theory

Within the one-dimensional comprehension of motivation we can detect antagonistic distinction between intrinsic and extrinsic motivation, which are presumed to have a negative connection (Effects of Externally Mediated Rewards on Intrinsic Motivation, 1971). Intrinsic motivation, originates from individual’s inner self. Extrinsic motivation is describing the instrumental execution of a task due to an external reason (Effects of Externally Mediated Rewards on Intrinsic Motivation, 1971).

The self-determination theory predicts three dimensions of motivation:

1. intrinsic motivation,
2. extrinsic motivation,
3. amotivation (lack of motivation). (DECI, et al., 1985)

Slovene language often raises misinterpretation of intrinsic and extrinsic motivation, because one equalizes inner motivation with intrinsic and outer motivation with extrinsic. Inner motivation includes a reward, which is internally controlled. This means that a person motivates itself by rewarding itself for performing an activity. Outer motivation gets controlled from outside sources, which means that the reward comes from outside.

Intrinsic and extrinsic motivation do not differ from the source of the reward, but from the fact that with the intrinsic motivation the activity is a goal for itself, while with extrinsic motivation, activity is only the mean to achieve that goal. When we talk about the intrinsic motivation, we talk about a motivation that results from person’s own inner impulses and it is not connected to a reward. The result of an intrinsic motivation is having fun while performing an activity and the outcome that is achieved. Extrinsic motivation is achieved from the outside, when the motivation derives from external impulses, with an intention to achieve a goal, e.g. higher pay, winning a competition… or avoiding something, e.g. a fee. (RENKO, 2009).
Intrinsic motivation
A student is intrinsically motivated, if he learns because he is interested in a certain topic, either to learn more about it, or to grade or develop his abilities while performing a difficult task. (MARENTIČ POŽARNIK, 1980)

Intrinsic motivation is hereditary and natural inclination to develop one’s inner abilities through learning, for which one does not need external stimulation. (STIPEK, 2002) This means that an intrinsically motivated person does not cling to external goals like rewards, good grades, recognition and public recognition. His typical inner motivational encouragements (curiosity, interests, excitement, enthusiasm, positive self-esteem), are the ones that stimulate the motivational process. (RAZDEVŠEK PUČKO, 1999) When an individual is intrinsically motivated, he does not need encouragements or punishment, because “the activity represents and reward by itself”. (WOOLFOLK, 2002 p. 320)

Extrinsic motivation
Opposite to the individual's internal impulse in intrinsic motivation extrinsic motivation is stimulated by outside impulses.

Typical for extrinsic motivation are outside motivational stimulations that arise from the society and surroundings. They are used by an outside person (parents, teachers, classmates or friends) to launch the motivational process. (RAZDEVŠEK PUČKO, 1999) Extrinsically motivated person act performs because of outside results (praise, approval, prize, punishment, exams and grading). He is not interested in the activity, the work is only “the mean to achieve positive and avoid negative results”. (MARENTIČ POŽARNIK, 2000 p. 188) An individual is motivated by expected results, which are set as goals of the activity. This is more important than the process and the source of confirmation comes from the outside. Extrinsic motivation is usually not permanent. If the source of outside stimulations disappears, the activity stops.

Extrinsic motivation is a notion that marks a performance of an activity because of an instrumental value (not because of interest). An individual with its help achieves a certain goal. (The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior, 2000) Traditional terminology describes it as motivation that can be triggered by outside factors and stimulations.

Amotivation
The lowest level of self-determination is called amotivation. The theory of self-determination does not include it in motivated behaviour, because it lacks intention. (A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation, 1999) It is typical that an individual in the state of amotivation does not experience any kind of connection with the given task; he lacks personal cause, because he does not see a point in executing it. He finds pressure as a result of factors that are outside of his control and does not feel he has any power in influencing the events. The actions that are based on amotivation share the fact, that the actor does not expect a reward and are not extrinsic neither are they done due to inherent reasons and they cannot be marked as intrinsic either.
Both, as well intrinsically as extrinsically motivated students achieve success in studies, but many believe that intrinsically motivated students have certain advantages. The researchers have discovered intrinsically motivated students are more creative, because experiences help them gain intellectually and keep them interested in studying.

The use of a computer in education
The recommendations for the application of ICT in learning courses are defined in the curriculum. Computerization of schools in Slovenia started soon (in 1972) and today all primary schools have computers connected to internet (BREČKO, et al., 2008 p. 22)

The use of ICT in education has been one of the key priorities in the development of the educational systems in developed countries. ICT in education has become a part of European and national strategies (e.g. Lisbon strategy, i2000, Strategy of lifelong learning). Knowledge based society should help move things in economy, based on knowledge, and create new jobs in areas where possibility of growth exist. The important areas are also education and research.

Basic research hypotheses
The main purpose of the research:

- Hypotheses related to self-knowledge of software and hardware (editing text, editing tables, editing presentations, computer components, graphics programs and multimedia);
- Hypotheses related to real knowledge in the field of software and hardware;
- Hypotheses related to motivation for education (intrinsic motivation, extrinsic motivation and amotivation);

Research sample
The research is based on a random sample of students from different countries (Slovenia, Turkey, Poland, Germany, Serbia and Croatia), different fields of studies and modes of studying. 264 students took part in the survey; 129 females and 135 males (see 1 table). The students joined the survey through different channels; e-mail, Facebook and with help of university professors, which informed their students about it and gave them the link to the online questionnaire.

<table>
<thead>
<tr>
<th>GENDER</th>
<th>f</th>
<th>f%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>135</td>
<td>51.1</td>
</tr>
<tr>
<td>Female</td>
<td>129</td>
<td>48.9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>264</td>
<td>100</td>
</tr>
</tbody>
</table>

The research included 51.1 % of males and 48.9 % of females.
2 table Number (f) and structural percentage (f%) of students in the survey according to the field of studies

<table>
<thead>
<tr>
<th>FIELD OF STUDIES</th>
<th>f</th>
<th>f%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art and humanities studies</td>
<td>213</td>
<td>80.7</td>
</tr>
<tr>
<td>Science and technical studies</td>
<td>51</td>
<td>19.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>264</td>
<td>100</td>
</tr>
</tbody>
</table>

The research included 80.7 % of students in the field of sociological and humanistic studies and 19.3% of students in the field of science and technological studies (see 2 table).

3 table Number (f) and structural percentage (f%) of students in the survey according to the mode of studying

<table>
<thead>
<tr>
<th>MODE OF STUDYING</th>
<th>f</th>
<th>f%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>199</td>
<td>75.4</td>
</tr>
<tr>
<td>Part-time</td>
<td>49</td>
<td>18.6</td>
</tr>
<tr>
<td>No answer</td>
<td>16</td>
<td>6.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>264</td>
<td>100</td>
</tr>
</tbody>
</table>

The research included 75.4 % of full-time students and 18.6 % of part-time students. The average age of the students is around 21 years (see 3 table).

4 table Number (f) and structural percentage (f%) of students in the survey according to the place of living

<table>
<thead>
<tr>
<th>PLACE OF LIVING</th>
<th>f</th>
<th>f%</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>163</td>
<td>61.7</td>
</tr>
<tr>
<td>Countryside</td>
<td>97</td>
<td>36.7</td>
</tr>
<tr>
<td>No answer</td>
<td>4</td>
<td>1.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>264</td>
<td>100</td>
</tr>
</tbody>
</table>

61.7 % of students live in the city and 36.7 % of students live in the countryside (see 4 table).

5 table Number (f) and structural percentage (f%) of students in the survey according to the country of residence

<table>
<thead>
<tr>
<th>COUNTRY OF RESIDENCE</th>
<th>f</th>
<th>f%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members of EU</td>
<td>132</td>
<td>50</td>
</tr>
<tr>
<td>Non-members of EU</td>
<td>132</td>
<td>50</td>
</tr>
<tr>
<td>TOTAL</td>
<td>264</td>
<td>100</td>
</tr>
</tbody>
</table>
There is the same number of students coming from European Union member countries as well as from countries outside of European Union (see 5 table).

**Accessories**

We collected the data with the following questionnaires: Motivational scale for education (AMS – C 28) (The academic motivation scale: A measure of intrinsic, extrinsic, and amotivation in education, 1992), Self-evaluation scale for knowledge of software and hardware (LSOZ) and Scare to determine real knowledge of software and hardware (LRZ).

**Results summary**

The analysis of differences in self-evaluation of knowledge of software and hardware, according to gender, field of study, mode of study, place of living and country of living, has shown statistically relevant differences, which are:

- Males (3.79) have self-evaluated their knowledge of editing tables, computer components and multimedia higher than female (3.28)
- Students of art and humanities studies (4.25) have self-evaluated their knowledge of editing text and presentations higher then students of science and technological studies (3.94)
- Full-time students (4.36) have self-evaluated their knowledge of editing presentations higher than part-time students (3.95).
- Students living in the cities (4.26) have self-evaluated their knowledge of editing text, tables and presentations higher then students who live in the countryside (3.94).
- Students living in countries outside of European Union (Croatia, Serbia and Turkey) (4.09) have self-evaluated their knowledge in editing text, tables, presentations and knowledge in computer components higher that students who live inside European Union (Slovenia, Poland, Germany (3.69).

The analysis of differences in real knowledge of software and hardware, according to gender, field of study, mode of study, place of living and country of living, has shown statistically relevant differences, which are:

- Males (3.27) have more knowledge of computer components, multimedia and graphics programs then female (2.42);
- students of sociology and humanistic studies (3.48) have more knowledge of computer components then students of science and technological studies (2.83);
- full-time students (3.83) have more knowledge of text and tables editing and in the field of computer components then part-time students (3.21);
- students living in cities (3.37) have more knowledge of text and tables editing and in the field of computer components and multimedia then students who live in countryside (2.88);
• students living in the countries outside the European Union (Croatia, Serbia and Turkey) (4.00) have more knowledge of text and tables editing and in the field of computer components then students who live in the European Union countries (Slovenia, Poland and Germany) (3.23);

• students living in the European Union countries (Slovenia, Poland and Germany) (3.81) have more knowledge of editing presentations then students living in the countries outside the European Union (Croatia, Serbia and Turkey) (3.43).

The research has shown that the students are mainly extrinsically motivated. There are no differences in gender as far as the motivation for studying is concerned. So we can assume that the motivation to study is approximately the same in males and females.

The research has shown that the students of sociology and humanistic studies are more intrinsically motivated than the students of science and technological studies.

There are no statistically relevant differences according to the place of living.

According to mode of study there is a statistically relevant difference. Part-time students have shown higher level of extrinsic motivation for studying.

According to the country, the data showed that the students living in the countries outside of European Union are more intrinsically motivated than students living in the countries of the European Union.

**Based on collected data we cannot confirm the following hypothesis:**

• students of science and technological studies would self-evaluate their knowledge of software and hardware higher than the students of sociology and humanistic studies where we confirmed results from previous study in Slovenia (KRAŠNA, 2010);

• part-time students would self-evaluate their knowledge of software and hardware higher than full-time students;

• students living in countries of the European Union would self-evaluate their knowledge of software and hardware higher than the students from countries outside of European Union;

• females have more knowledge of software and hardware than males;

• students from the countries of the European Union have more knowledge of software and hardware than the students from the countries outside of the European Countries;

• females are more motivated than males;

• full-time students are more motivated than the part-time students;

• students living in the cities are more motivated for studying than the students living in the countryside;

• students living in the countries of European Union are more motivated for studying than the students living in the countries outside of European Union.
Based on collected data we can confirm the following hypothesis:

- males self-evaluated their knowledge of software and hardware higher;
- students living in cities self-evaluated their knowledge of software and hardware higher;
- students of sociology and humanistic studies have more knowledge of software and hardware than students of science and technological studies;
- full-time students have more knowledge of software and hardware than part-time students;
- students living in cities have more knowledge of software and hardware than the students living in the countryside;
- students of sociology and humanistic studies are more motivated to study than students of science and technological studies;

While predicting real knowledge in combination with educational motivation we established that intrinsic motivation has statistical relevance on knowledge. By raising intrinsic motivation one would also increase knowledge.

Amotivation has statistical relevance on knowledge. By raising amotivation the knowledge would lower.

The influence of extrinsic motivation on the knowledge is not statistically relevant.

**Conclusions**

The research has shown that the self-evaluated knowledge is higher than the knowledge verified by tests in software and hardware. Students have given themselves the highest self-evaluated grades in knowledge of Word processors and hardware, which is not a surprise, because these programs are mostly used for the presentation of their work and writing of essays and seminars. Students received the lowest points in the areas of multimedia, graphics programs and computer components.

The empirical research has confirmed that if the intrinsic motivation had been raised, the real knowledge of software and hardware would have been raised as well. If the amotivation had been raised, the real knowledge of software and hardware would have been lowered.

Needs, goals and aspirations of students are changing and there is a need to update the methods and forms of higher teaching and reward. How do students perceive education and how resolved that dilemma, having committed to the quality of higher education are subject to future scientific study.
LITERATURE

A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation.


