PEDAGOGICZNE

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THE YOUNG EXPLORERS UNIVERSITY STUDENTS' EMOTIONAL ACTIVATION IN NON-FORMAL EDUCATION – RESEARCH REPORT[2]

AKTYWIZACJA EMOCJONALNA STUDENTÓW UNIWERSYTETU MŁODEGO ODKRYWCY W EDUKACJI POZAFORMALNEJ – RAPORT Z BADAŃ

Streszczenie: W artykule przedstawiono wyniki badania ilościowo-jakościowego i ustalono, w jaki sposób dochodzi do aktywizacji emocjonalnej uczniów szkoły podstawowej, którzy uczestniczyli w zajęciach edukacji pozaformalnej. Badaniem objęto populację docelową 1 496 uczniów szkół podstawowych z terenu województwa podkarpackiego, z której wylosowano populację badawczą 536 uczniów szkół podstawowych. Główną metodą badawczą była metoda sondażu diagnostycznego, w której techniką była ankieta, a narzędziem kwestionariusz ankiety. W badaniach wykorzystano pięć cech edukacji pozaformalnej, którą scharakteryzowano na podstawie tematyki prowadzonych zajęć, relacji nauczyciel-uczeń, motywacji do nauki, wykorzystania technologii informacyjno-komunikacyjnych, a także nabywania umiejętności praktycznych. Na podstawie przeprowadzonych badań można stwierdzić, że aktywizacja emocjonalna studentów uczestniczących w zajęciach edukacji pozaformalnej występuje wyłącznie w postaci emocji pozytywnych, tj. ekstazy, radości, zaufania. Można również stwierdzić, że wyodrębnione zakresy aktywizacji emocjonalnej uczniów miały najwyższy stopień aktywizacji emocjonalnej w kontekście technologii informacyjnych i komunikacyjnych, a także rozwoju umiejętności praktycznych.

Słowa kluczowe: studenci, edukacja pozaformalna, aktywizacja, emocje

Abstract: The article presents the results of a quantitative-qualitative study and establishes how emotional activation of elementary school students who took part in non-formal education

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classes occurs. The study involved a target population of 1,496 elementary school students from the Subcarpathian region, from which, the study population of 536 elementary school students was drawn. The main research method was the diagnostic survey method, in which the technique was a survey and the tool was a survey questionnaire. The research was based on five characteristics of non-formal education, which was characterized based on the subject matter of the classes held, the teacher-student relationship, motivation to learn, the use of information and communication technologies, as well as the acquisition of practical skills. Based on the research, it can be concluded that emotional activation of students participating in non-formal education classes occurs only in the form of positive emotions, i.e. ecstasy, joy, trust. It can also be concluded that the isolated scopes of emotional activation of students had the highest degree of emotional activation in the context of information and communication technologies, as well as the development of practical skills.

Keywords: students, non-formal education, activation, emotions

Introduction

Student activation at each stage of education is a prerequisite for the proper teaching-learning process. The proper activation of a student involves an individually made decision guided by the desire to achieve a specific goal, is self-controlled, performed on one's own responsibility and carried out for one's own satisfaction (Stańko-Kaczmarek, 2013). In addition, activation is the tendency and ability to respond vividly and actively with attention, feeling and thought to various stimuli, situations and tasks imposed by both reality and school education, as well as the desire to learn, discover and master things and facts considered interesting (Surmna, 2012).

Emotional activity of elementary school students in non-formal education is the main objective of the presented article. The research conducted shows what emotions accompany students in non-formal education, as well as how the emotions of students participating in non-formal education activities change.

It is assumed that the modern form of formal education (Surma, 2012; Wilczek, 2017) is designed to stimulate the conscious and comprehensive self-development of a person, but instead of doing this through encyclopedic teaching, it is done through the training of comprehension skills, the stimulation of cognitive abilities, sensitivity and curiosity about the surrounding world, and the readiness to pierce newly acquired knowledge into action. Hence, formal education should stimulate the main areas of student activation, namely: cognitive, emotional and practical (Kusiak, 2009). At present, it is difficult for formal education to effectively achieve these goals in such a rapidly changing information society, especially since modern education to this day prefers reconstruction (i.e. reproduction of the existing order) over innovation (Mazurkiewicz, 2015).

Therefore, it becomes necessary to complement formal education with other forms of activities taking place, for example, in the form of non-formal education, which will emphasize inspiring and motivating students to learn, thereby activating

them and their desire to acquire new knowledge and skills (Sławiński and others, 2014).

Non-formal education is learning organized institutionally, in programs that are not part of formal education. (Stęchy, 2021). Another definition sees non-formal education as: a form of learning consisting of a conscious approach to experiences, exercises that result in intellectual and emotional activation, as well as the emergence of new behaviors, activities organized outside of educational programs, leading to the acquisition of licensed qualifications (Warchoł, 2021).

Based on the above definitions, it is possible to distinguish a number of specific features of non-formal education and group them into the following scopes:
1. The curriculum (program, agenda);
2. The teacher-student relationship;
3. The motivation for learning;
4. Information and communication technologies;
5. Practical skills.

Non-formal education can be also characterized on the basis of the following parameters: purposefulness of the organization, program requirements, qualifications acquired and the nature of learning. The first characteristic concerns purposefulness, i.e. the assumption of certain anticipated states of knowledge and skills of students that will be acquired and mastered. The second characteristic relates to the curriculum that is formally required in non-formal education. The third characteristic refers to the qualifications in question, which may or may not occur. The last characteristic refers to the intentionality of learning, which in this case must be fulfilled, so the student entering non-formal education wants to learn. (Slawinski and others, 2014).

We conclude that non-formal education follows a structured learning process, which is a key condition for supporting formal education. Non-formal education seems to be an ideal environment to adequately stimulate a variety of student activities and, above all, to inspire and motivate students to learn.

Within the framework of the previous literature analysis, it can be assumed that non-formal education is an ideal environment in which the emotional activation of the student is manifested through the emotions felt by the student.

Emotional activation of students identified in non-formal education

Before delving into the terminology, let's note that emotional activation is directly related to emotional intelligence (Dąbrowski, 2004, pp. 315-320). Emotional intelligence includes: the ability to properly perceive, evaluate and express emotions, the ability to access feelings, the ability to generate feelings when they can support thinking, the ability to understand emotions and understand emotional knowledge, and finally the ability to manage emotions in a way that promotes emotional and intellectual development (Salovey, Sluyter, 2009).

Emotion is a term that lacks a clear definition despite the numerous collective works and articles. Most theoretical assumptions indicate, however, that *emotion is bodily changes that are a direct result of the factor that causes stimulation – the very feeling of these changes occurring within us as they appear* (James, 2002; Dębowski, 2014; Gibson, Cornell, Gill, 2017, pp. 295-309).

As part of our theoretical assumptions, we also allow the interpretation of emotional activation of students on the basis of R. Plutchik's wheel of emotions, which was developed in the 1970-80s and accounted for eight basic emotions.

These emotions are innate and directly related to adaptive behavior that is designed to aid survival. The Plutchik wheel considers the following to be the basic emotions: *sadness, surprise, fear, trust, joy, anticipation, anger,* and *disgust.* A graphical representation of R. Plutchik's wheel of emotions and derivate emotions is shown in Figure 1.

According to R. Plutchik, a variety of new qualities arise from the eight basic emotions at the center of the model: „mixed emotions". R. Plutchik placed the emotions that combine relatively easiest next to each other. They form the 1st degree, 2nd degree and 3rd degree diads shown in Figure 1 (Jarymowicz, Imbir, 2010, pp.440-443).

The emotions that R. Plutchik placed in the center inside the circle have the highest degree of emotional intensity. In this way, emotions of lower emotional intensity are formed, for example, ecstasy, joy, and serenity. It should be added that emotions placed opposite each other with the highest level of intensity do not merge (Plutchik, 1980; Grzegorzewska, 2012).
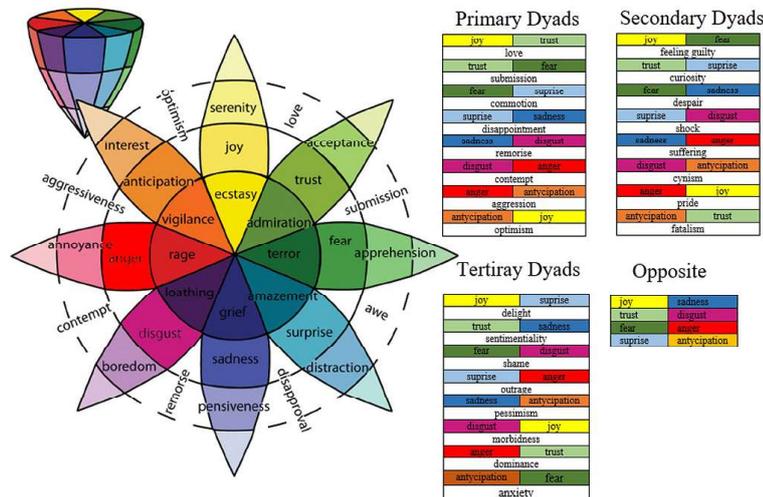

Figure 1. Plutchik wheel and derivative emotions divided into dyads: primary, secondary, tertiary (R. Plutchik, 1980). (CC BY-SA 3.0)

The model adopted by R. Plutchik is one of the most commonly used in the analysis of students' emotions in the process of learning and teaching, examples of which are the studies by: Ahmed S. (Ahmed, 2004, p. 208), Ahmed. W, Werf G., Minnaert A., Kuyper H. (Ahmed, Werf, Minnaert, Kuyper, 2013, pp. 152-154), Lüdtke O., Goetz T., Frenzel A, Pekrun R (Lüdtke, Goetz, Frenzel, Pekrun, 2007, pp. 718-720).

Research procedures and methods

The research was carried out between 2018 and 2020, as part of the project *Uniwersytet Młodego Odkrywcy* (lit. Young Explorer's University) organized by the Polish Ministry of Science and Higher Education.

The project's key objectives were to: develop educational programs and adopt innovative teaching activities for children and youth from primary schools, aimed at boosting competences that would help participants tap into their cognitive curiosity (NCBR, 2021).

The funds ended up being allocated to the University of Rzeszów for the project: *Uniwersytet Rzeszowski dla młodych odkrywców* (lit. University of Rzeszów for Young Explorers), which included 1,495 primary school pupils from among whom a simple random sample of 532 students was drawn. Detailed information on the randomly selected sample is presented in Table 1.

Table 1. Details of the study sample

Gender	Number	Place of residence		Age of students						
		City	Village	9	10	11	12	13	14	15
Girls	220	60	160	31	25	41	42	30	36	15
Boys	312	86	226	25	37	63	69	54	51	13

The project envisaged a series of three meetings, each 8 teaching-hours long, conducted at three-month intervals, during which students were to learn to program robots made of Lego Mindstorms NXT 2.0 bricks. The classes followed a specially designed curriculum, which assumed the implementation of the educational content in the field of robot programming using the Lego Mindstorms NXT 2.0 software.

Students' emotional activation was measured during the first and last classes, so the results show clear changes in students' emotional activation during non-formal classes.

The main purpose of the research was to determine the emotional activation of students participating in non-formal education activities, for which three specific goals were set out:
1. Determine the nature of students' emotions (positive, negative) in non-formal education activities,

2. Pinpoint the names of the emotions that appear in students participating in non-formal education activities,

3. Establish the derivative emotions (dyads) of the first, second and third level appearing in students in the course of non-formal education activities.

The research was carried out using the diagnostic survey method in which the research technique was a questionnaire, while the research tool was developed using CAWI (Gurba, 2020).

An electronic survey questionnaire in the form of a multidimensional scale, otherwise known as the Osgoda scale, makes it possible to conduct a psychological analysis of a subject, what is more – to examine the emotional attitude of the examined subjects toward a certain concept, e.g. school, home.

The electronic questionnaire concerned five scopes related to the main characteristics of non-formal education, i.e.: topics of classes, teacher-student relation, motivation, use of information and communication technologies, development of practical skills during classes.

In each of these scopes, 4 pairs of emotions were available in accordance with the model of R. Plutchik adopted in the research part indicating the name of the maximum positive emotion as well as the maximum negative emotion. The pairs of these emotions along with the assumed intensity of emotions derived from the horizontal model of R. Plutchik model are presented below:

- *ecstasy* (intensity 3 points) – *grief* (intensity -3 points),
- *admiration* (intensity 3 points) – *loathing* (intensity -3 points),
- *terror* (intensity 3 points) – - *rage* (intensity -3 points),
- *amazement* (intensity 3 points) – vigilance (intensity -3 points).

The assumed intensity of the emotions results from the fact that between the indicated emotions in the given pairs there are other emotions of lower emotional intensity. The students surveyed were given the opportunity to choose to select one emotion in a pair within each research range.

During the pre-screening, the students were tutored by a psychologist on how to identify their emotions. The classes with the psychologist consisted of discussing all types of emotions included in the completed questionnaire of the survey in the form of a semantic differential. For each of the emotions presented, the psychologist presented a short educational video to show the students what emotions the characters in the video are driven by and what they might be feeling. In this way, students were aware of the emotions they were feeling and were able to determine whether a particular emotion was positive or negative, as well as which of the emotions presented in the survey questionnaire corresponded to their emotions.

In order to reduce the distortion of the results of the study of emotional activation of students, all classes were conducted by one teacher, who is a researcher at the University of Rzeszow. His teaching activities in each group looked similar.

The teacher used a prepared curriculum, as well as handouts that included all the tasks to be carried out for students during non-formal education.

Analysis and discussion of results

Our findings were analyzed against the three specific goals indicated in the previous section.

The first scope of research concerned the determination of the nature of students' emotions (positive, negative) that appeared in the context of their participation in organized non-formal education activities. The analysis was carried out on the basis of the selected features of non-formal education, and the obtained results are shown in Table 2.

Table 2. Statistical data for the individual features of non-formal education

Selected features of non-formal education	Initial measurement				Final measurement				Statistical significance
	M	SD	V	D	M	SD	V	D	P
Teaching program (agenda)	1.4	1.8	72%	3	1.8	1.2	66%	3	0,021
Teacher-student relationship	1.1	1.8	58%	3	1.7	1.3	78%	3	0,017
Motivation to learn	1.2	1.8	65%	3	2	1.2	73%	2	0,015
Use of information and communication technologies	1.5	1.8	85%	3	2.1	1.2	60%	3	0,02
Acquiring practical skills	1.4	1.8	80%	3	1.9	1.3	65%	3	0,019

Legend: M – mean value from all scores, SD – standard deviation, V – coefficient of variation, D – mode (dominant value), P – statistical significance.

Having analyzed the inputs from the table, we found that the emotional activation of primary school students was, from the beginning, marked by only positive emotions, as the average intensity for each feature of non-formal education was positive. Let us also note that the average intensity of emotions increased over time, having climbed up 0.4-0.6 degrees of intensity for each range in the final measurement.

Particular attention should be paid to the constants *teacher-student relationship, use of information and communication technologies* and *acquiring practical skills*, for which the highest growth was reported.

The logs for the standard deviation also indicate that, in the initial test, students' feedback was somewhat dispersed, whereas in the final measurement, the dispersion of responses decreased and oscillated at the intensity value of 3 pts. A correlation

of that sort is also confirmed by the reported coefficient of variation. It is worth adding at this point that, for most features of non-formal education, the mode of emotional intensity stood at 3 pts., therefore indicating emotions such as: *ecstasy, admiration, terror, amazement.*

Based on the obtained results of statistical significance, we can conclude that in all the research ranges, the coefficient "P" did not exceed the permissible error limit.

In the subsequent part of our analysis, we developed graphical figures to show the frequency distribution of the students' responses provided in the initial and final stage of the research. In Figure 2, most responses are skewed towards right of the graph, which confirms that students were emotionally active from the very beginning. The number of these responses exceeds the study group and that is because these values correspond to the four pairs of emotions assigned to the individual features of non-formal education.

Quantitative distribution of responses in the preliminary study in terms of selected features of non-formal education

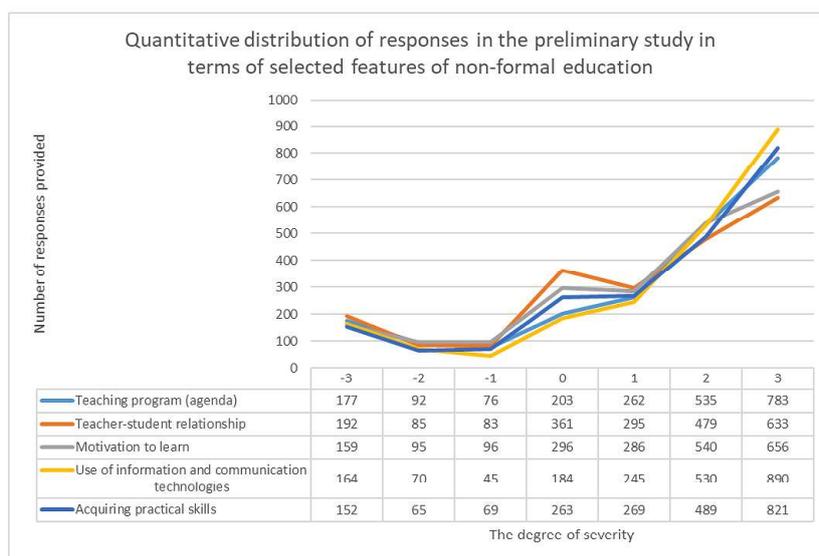|	-3	-2	-1	0	1	2	3
Teaching program (agenda)	177	92	76	203	262	535	783
Teacher-student relationship	192	85	83	361	295	479	633
Motivation to learn	159	95	96	296	286	540	656
Use of information and communication technologies	164	70	45	184	245	530	890
Acquiring practical skills	152	65	69	263	269	489	821

The degree of severity

Figure 2. Frequency distribution of responses in the initial measurement

The next graph, Figure 3, reports inputs from the final part of the research, which shows that the number of low-intensity emotions experienced during the last class decreased while the number of high-intensity positive emotions increased.

The second scope of research concerned the naming of emotions that appear in students participating in non-formal education activities. Also this part of our analysis was based on the selected features of non-formal education, but the data was instead worked into graphs where the theoretical assumptions of the Plutchik wheel and semantic differential were applied. The results are presented as the range of four pairs of emotions lying on opposite ends, with the levels of intensity in the upper part of the graph indicating the level of intensity of the emotions within the pair.
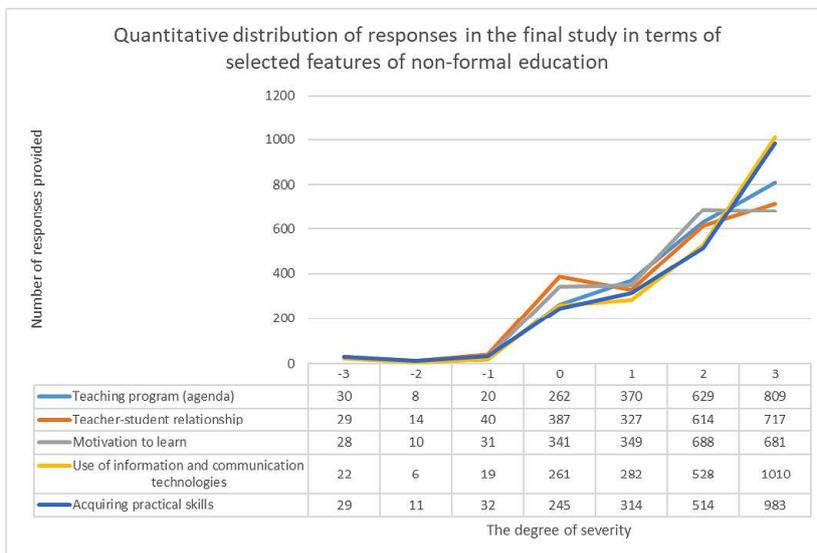
Figure 3. Frequency distribution of responses in the final measurement

The first feature of non-formal education is the teaching program. The results of this part of the research are shown in Figure 4.
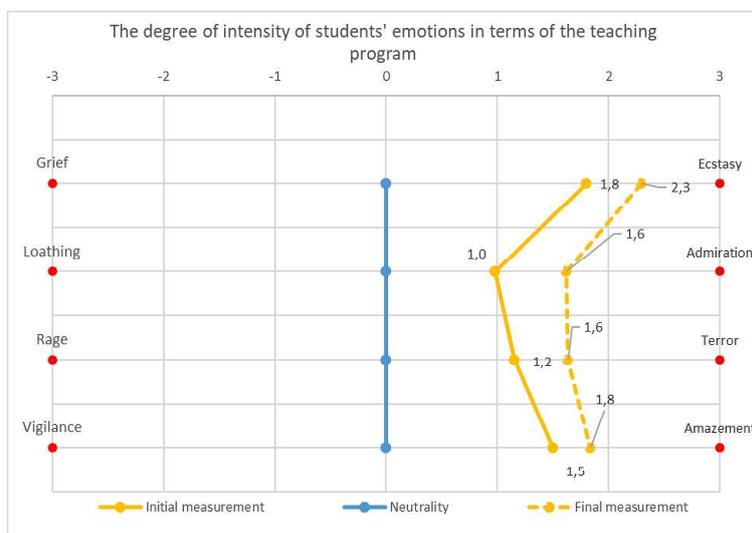

Figure 4. Emotional activation of students in non-formal education for the teaching program

Analyzing the data presented in the figure, it should be noted that the topics of the curriculum aroused the following emotions in the students: *joy, acceptance,*

fear, and *distraction* bordering on *surprise*. Meanwhile, their emotions during the last class became more intense and, in the case of the first pair of emotions, went beyond *joy* towards *ecstasy*. A similar trend was observed for the remaining pairs of emotions that ended up approaching the intensity of the second level, that is emotions such as: *trust, fear, surprise*.

All this indicates that students were initially joyful and eager to embrace the teaching program but at the same time afraid it might prove difficult for them. In the final measurement test, the effect of the increasing level of difficulty could be observed, which resulted in students feeling *fear*.

In this regard, it was students aged 9, 10 who most often indicated that they were accompanied by emotions: joy, ecstasy. At ages 11 to 13, students indicated: bliss, joy, confidence. Students 14, 15 in addition to the aforementioned chose fear.

In the next part, the teacher-student relationship in non-formal education was analyzed in terms of emotions experienced. The relevant results are shown in Figure 5.
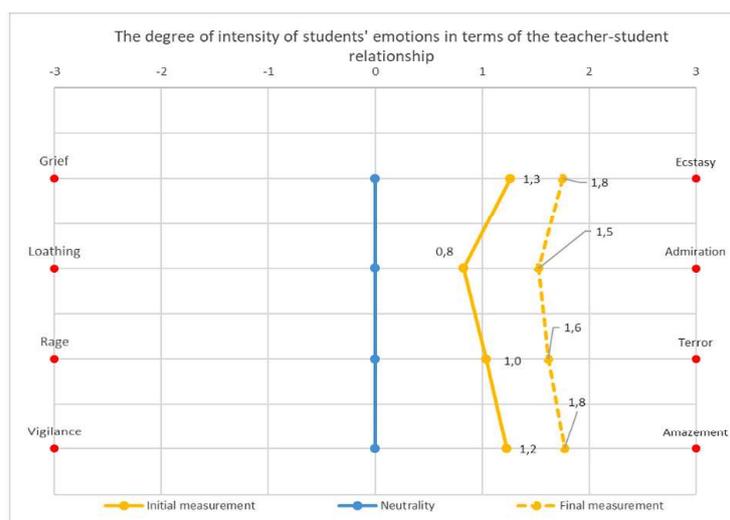

Figure 5. Emotional activation of students in non-formal education for the teacher-student relationship

The first study indicates that students experienced the following emotions towards their teacher: *serenity, acceptance, fear,* and *distraction*. Let us note that, under the adopted concept, *fear* is also considered a positive emotion, as it is thought to forecast commitment and effort. During the final measurement, students showed an increased intensity of positive emotions and a significant increase of emotions overall, approximating the second tier of intensity for the first and second pair of emotions, therefore experiencing *joy* and *surprise*.

In the range analyzed, changes in emotions by age category indicated that it was students aged 9 to 13 who chose joy, while those aged 14, 15 chose bliss and confidence.

Another analysis was to measure students' motivation, and the results are shown in Figure 6.
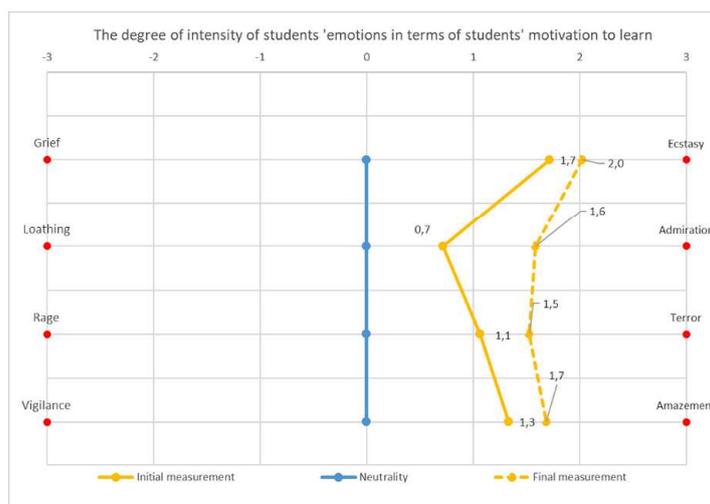

Figure 6. Emotional activation of students in non-formal education for motivation.

In the case of non-formal education, students presented only internal motivation, as all their emotions were positive. For the first pair of emotions, students were reported to feel serenity whose intensity bordered on joy. In what concerns the second pair of emotions, students showed a low intensity of emotions approaching acceptance, while for the next pair, fear and distraction were prevalent.

In the final study, these emotions increased for the second pair, reaching an intensity close to the feeling of trust.

The motivation of the students in the age category was as follows. Students aged 9, 10, 11 showed a lot of positive emotions ie: ecstasy, joy. On the other hand, students aged 12, 13, 14, 15 emotions with a lower level of intensity ie: acceptance, surprise. This may mean that the older group of students was not properly motivated to act.

An important asset of non-formal education is the use of various information and communication technologies (ICT) in teaching and learning. The results of students' feedback for this variable are shown in Figure 7.
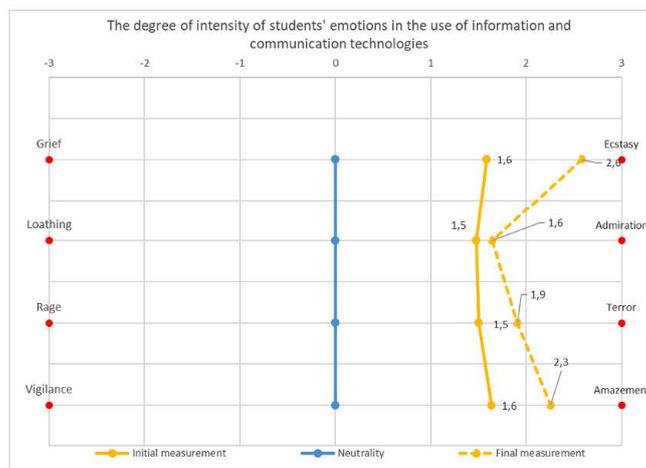
Figure 7. Emotional activation of students in non-formal education for the use of information and communication technologies

For this variable in particular, significant disparities in the emotional activation of students were observed. Initially, students experienced emotions such as: *serenity*, *acceptance*, *fear* and *distraction*, which in the final measurement increased markedly and were close to *ecstasy* for the first pair of emotions. In the last pair of emotions, they revolved around *surprise* leaning towards *amazement*.

The highest level of intensity of emotional activation was shown by students in the younger age range of 9 to 13 years. The indicated students showed emotions of: ecstasy, admiration. The older ones aged 14, 15 years j showed emotions with lower levels of intensity, i.e. joy, serenity.

The last tested variable concerned practical skills acquired in the course of non-formal education, which, as our findings show in Figure 8, are as important for the emotions of students as ICTs.

Based on these results, it can be concluded that students display positive emotions when they can learn practical skills. Our data shows that students, similarly as with ICTs, already at the start experience emotions such as: *serenity, acceptance, fear, distraction*. However, the intensity of emotions increases across all pairs by the time the final measurement is performed, mainly for the first pair in which the emotions go beyond *joy* to approach the feeling of *ecstasy*.

In an age analysis in this regard, students aged 9-13 showed surprise, confidence. Older students, i.e. 14-15 years of age, emotions of lower intensity.

The last stage of our research concerns the determination of derivative emotions, that is, primary, secondary and tertiary dyads appearing in students throughout non-formal education.

In the case of primary dyads, the only feature of non-formal education in which they occurred was practical skills. Here, we should single out *love*, due to the high

intensity of *joy* (2.4 pts.), and *trust* (1.8 pts.), followed by *submission*, due to the high intensity of *trust* (1.8 pts.) and *fear* (1.8 pts.), as well as *attentiveness*, due to the high intensity of *fear* (1.8 pts.) and *surprise* (1.8 pts.). All this means that acquiring practical skills is in fact associated with a very large number of positive emotions being experienced.
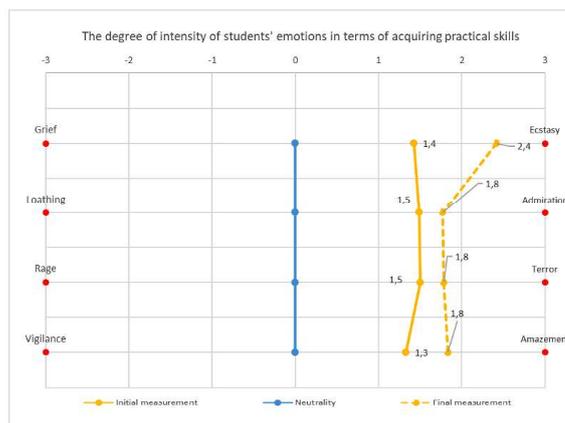

Figure 8. Emotional activation of students in non-formal education for the acquisition of practical skills

As for the secondary dyads, derivative emotions were observed for ICTs and practical skills.

For ICTs, students – apart from the basic emotions – displayed a sense of *remorse*, owing to the high intensity of *joy* (2.6 points) and *fear* (1.9 points).

Moving on to practical skills, two secondary emotions occurred: *remorse* and *awe*. The former – because there was a high intensity for *joy* (2.6 points) and *fear* (1.9 points), while the latter – because there was a high intensity of *trust* (1.8 points) and *surprise* (1.8 points). To justify the emergence of these emotions, they seem to have been offset by the significant amount of damaged equipment during the learning of practical skills. *Awe,* meanwhile, points to the fulfillment of the basic role of non-formal education, which is that of awakening cognitive interests (B. Muchacka, 2014).

Finally, the tertiary dyads were observed in each of the studied areas of non-formal education. Let us also note the same emotion, *amazement*, appeared across all selected features. In the teaching program, it was because the intensity of basic emotions was particularly high for *joy* (2.3 points) and *surprise* (1.8 points); in the teacher-student relationship, it was because the intensity of basic emotions was high for *joy* (1.8 points) and *surprise* (1.8 points), too, while for motivation it was: *joy* (2.0 points) and *surprise* (1.7 points). Lastly, we have the use of ICTs, where the intensity of emotions was high for *joy* (2.6 points) and for *surprise* (2.3 points), and the acquisition of practical skills, where the intensity ran high for *joy* (2.4 points) and also for *surprise* (1.8 points).

Conclusion

As a result of the study, it can be concluded that the emotional activation of students changes as a result of their participation in non-formal education activities. This conclusion can be considered preliminary, because it was derived solely on the basis of the statistical data presented.

Going forward, it should also be concluded that each aspect detailed in the article of non-formal education, i.e.: topics of classes, teacher-student relationship, motivation, use of information and communication technologies and acquisition of practical skills had a positive impact on students' emotional activation in non-formal education.

In the case of the subject matter of the activities, the students felt only positive emotions such as: bliss and joy.

A similar situation also occurred in terms of the teacher-student relationship. In this regard, the students, through the fact that the class was taught exclusively by one teacher, were able to establish a certain relationship with the teacher and place a certain amount of trust in him. The students stated that this relationship caused them to be emotionally active and showed in this regard: joy and bliss.

The teacher plays an important role in the organization of non-formal education, because he watches over the correct course of activities supporting understanding (Filipiak, 2011; Filipiak, Lemanska-Lewandowska, 2015).

In the next area of motivation, non-formal education classes also supported emotional activation of students and aroused only positive emotions mainly bliss. This shows that students were engaged during non-formal education activities.

Such a conclusion is also confirmed by the research of R. Michalak, who found that motivation is associated with positive feelings of the student, if students are involved in the learning process, actions and reasons for taking them (Michalak, 2016, pp. 90-95).

The last two research scopes are special, because in this context the students showed greater changes than in the previous scopes.

In the case of the first, which dealt with the use of ICT, it must be concluded that there is a clear relationship between emotional activation and the use of ICT. This conclusion was drawn based on the change in emotional activation of students in this scope from (1.5 points). to (2 points). Students unanimously determined that emotions such as ecstasy and joy accompanied them in this regard. This shows that ICT is a good means of introducing specific content into the sciences, as students were more willing to learn to design, construct, program and acquire knowledge just by using ICT. Thus, it can be assumed that ICT causes emotional activation of students, but this area is very broad and requires further analysis and research, which will focus exclusively on the impact of ICT on emotional activation of students.

In the case of practical skills, there were similar effects as in the use of ICT. Students become more emotionally activated if a large part of their learning in

the educational process is the acquisition of practical skills. They then feel such emotions as bliss, joy and ecstasy.

Summarizing the obtained results of the study, it should be said that the designated scopes allow to characterize non-formal education and determine which of them, according to the opinion of students, had the greatest impact on their emotional activation. Therefore, one should not draw hard conclusions from the results presented stating that non-formal education has an impact in terms of students' emotional activation. We can only conclude that non-formal education is related to the stimulation of students' emotional activity, and its specifics, i.e.: the subject matter of the classes, the teacher-student relationship, motivation, the use of information and communication technologies, the acquisition of practical skills arouse positive emotions.

It is also worth pointing out that the organized non-formal education classes were held at the university, which received funding for the project, so the survey was conducted under precisely prepared and created conditions. It is therefore worth checking whether the results presented would be repeated during the same classes, but conducted outside of school hours, for example, at a school or community center. In addition, it raises the question of whether it was a coincidence that coming to universities caused so much emotional activity in students?

It is also important to point out that the survey was conducted using an electronic survey questionnaire, and students gave their answers using a tablet, sitting close to each other. Despite the fact that they were informed of the independence of completing the questionnaire, there may have been cases in which students may have repeated answers that were given by students close to him.

Bilbiography

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