

Teachers' Emotional Experience in Online Classes in Adult Education in Selected European Countries

Andreas Ahrens, Jelena Zascerinska

Abstract—Emotions are crucial in online classes in adult education. Despite that, a little attention was devoted to the emotional experience of being an online teacher in the field of andragogy, and the online teacher's emotional perspectives in ever changing environments have to be analysed. The paper aims at the analysis of teachers' emotional experience in online classes in adult education in selected European countries. The research tends to propose implications for training of teachers who work in online classes in adult education. The survey was conducted in April 2022. In the selected European countries 78 respondents took part in the study. Among them, 30 respondents represented Germany, 28 respondents Greece, and 20 respondents were from Italy. The theoretical findings allow defining teacher emotional experience. The analysis of the elements of the respondents' emotional experience allows concluding that teachers' attitude to online classes has to be developed. The key content for teacher training is presented. Directions of further work are proposed.

Keywords—Adult education, online classes, teacher emotional experience, European countries.

I. INTRODUCTION

THE COVID-19 pandemic has recently spread over the whole world. COVID-19 was found in China on 31st December 2019 [27]. In early 2020, COVID-19 was identified as a pandemic by the World Health Organisation (WHO) [27].

The global outbreak of COVID-19 has intensified such changes in adult education [26] that have never been experienced before. The spread of the pandemic COVID-19 has significantly disrupted the adult education sector which is a critical determinant of a country's socio-economic future in the conditions of demographic change, global competition, technological development and the current crisis [1].

Many teachers have experienced rapid transformations from conventional prototype to digital prototype of teaching [2]. Teaching in online classes is the "new normal" for adult education teachers since the start of COVID-19 pandemic. Teaching in formal education including adult education means a well-structured process that teacher uses to divvy up his/her knowledge, skills and attitudes, also known as experience, with learners [3]. Emotions are a crucial aspect of the educational process in which teaching is the first phase [4]. Teaching including online teaching is driven by the emotions, being the "mechanism" of activity's movement [5]. Emotions accompany each single step in the teaching process [6]. Emotions in the teaching process positively impact the adult learners' learning

process [6]:

1. Increase learning motivation and efficiency learning,
2. Contribute to the involvement of students in creative activities activity, and
3. Stimulate their intellectual activity, attention, memory.

In addition, positive emotions are closely related to learners' mental health [6]. Understanding the current situation with learners' emotions can serve as a guide for driving the further development of the teaching process being a social activity in adult education and adult learners' personal and professional development [7]. Also, the development of adult learners' positive emotions might improve their educational achievements [6]. However, the emotional experience of being an online teacher is notably under-theorized in the andragogic literature [8], and the empirical studies on teachers' emotional perspectives in online teaching in adult education continue to be scarce. A study on higher education educators' emotions who were involved in the transition to online teaching was only presented [9].

The aim of this paper is to analyse teachers' emotional experience in online classes in adult education in selected European countries underpinning the elaboration of implications for training of teachers who work in online classes in adult education.

II. CONCEPTUAL FRAMEWORK

Adult education covers all kind of formal, non-formal and informal learning, adults engage in after finishing their initial education and training, for a variety of purposes [10]. Adults could wish to receive re-skilling and up-skilling for professional reasons or to enhance their social, cultural, artistic and societal learning for private purposes [10].

Teacher in adult education is a qualified and/or certified professional who purposefully organizes the process of teacher's sharing experience (knowledge, skills and attitudes) with learners.

The topic of 'emotions' is extraordinary complex [11]. The emotions are listed in Fig. 1. Our definition of emotions is based on the System-Constructivist Theory [12]. This Theory implies Parson's system theory where any activity is considered as a system, Luhmann's theory on communication as a system, theory of symbolic interactionism, and theory of subjectivism [12].

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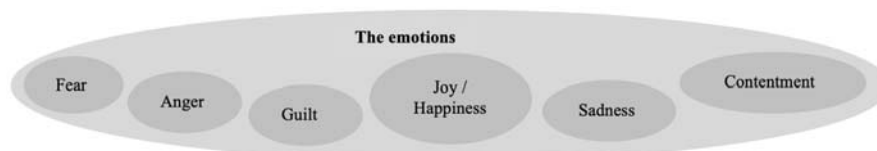


Fig. 1 The emotions

The System-Constructivist Theory allows defining emotions as signs. Emotions can be expressed by feelings, face expression, voice shift, changes in human appearance (loosing weight, putting on weight, grey hair, a good colour of the face, etc), and action transformations [13], attitudes [5], mood, verbal expressions, word meaning, and vocal intonation [14] as well as other elements. The emotion elements are grouped into the emotion triangle [15] shown in Fig. 2.

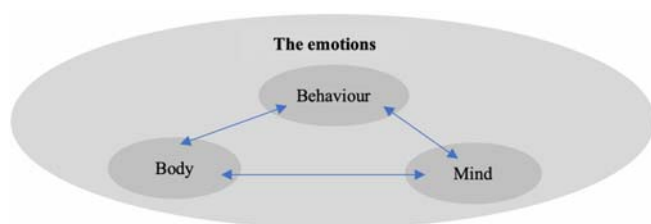


Fig. 2 The emotion triangle

Our interpretation of the inter-connections between emotions, behaviour, body and mind demonstrates that these emotion groups can be separated and at the same time should be analysed in relation to the other emotion groups.

The main emotions' functions are evaluative [15] and motivating [5]. The emotions are of the socio-cultural nature.

The emotions are socially constructed [16].

Emotional intelligence is determined as the ability to understand, recognize and manage own and other people's emotions, and is also responsible for adaptation in general quality, decision-making in various life situations, conflict-and stress resistance, resilience and world outlook [17].

In pedagogy, experience is the individual combination of knowledge, skills and attitudes [18]. Knowledge is presented by concepts [19]. Skill is defined to be an ability to act in accordance with the required quality and volume [20]. Attitude refers to an individual combination of evaluative judgments about a phenomenon [18]. Fig. 3 interprets the inter-connections between, on the one hand, body, behaviour and mind and, on the other hand, knowledge, skills and attitude.

The understanding of emotional intelligence and experience within the System-Constructivist Theory allows identifying teachers' emotional experience as an individual combination of abilities as well as knowledge, skills and attitude based on individual's social interaction and cognitive activity to understand, recognize and manage own and other people's signs aimed at decision-making in various life situations for social adaptation, conflict-and stress resistance, resilience and world outlook. This definition allows determining criteria, indicators and constructs of teacher's emotional experience as illustrated in Table I.

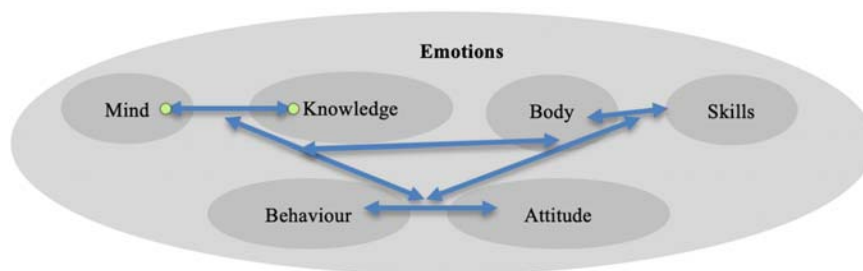


Fig. 3 The inter-connections between body, behaviour and mind as well as knowledge, skills and attitude

TABLE I CRITERIA, INDICATORS AND CONSTRUCTS OF TEACHER'S EMOTIONAL EXPERIENCE		
Criteria	Indicators	Constructs
Teacher emotional experience	Experience of social interaction	Social interaction: teachers [21] - participate in the activity, - exchange ideas with others, - co-operate with others, - analyse a problem, - are in the dialogue and - search for problem solving tools together with others
	Experience of cognitive activity	Cognitive activity: teacher [22] - regulates his/her own learning process, - sets his/her own goals, - takes responsibility for his/her own learning - works independently, - evaluates his/her own learning process and - continues to improve his/her own skills

Together with the shift from conventional to online teaching, the socio-cultural environment in adult education has changed, too. The motion to online teaching facilitated the transfer in teachers' emotional experience, too.

III. EMPIRICAL STUDY

The empirical study was guided by the research questions:

What is teacher emotional experience in online classes in adult education? The purpose of the empirical study is to analyse teachers' opinion on their emotional experience in online classes in adult education.

The empirical study was built on the survey questionnaire. Table II presents the inter-relationship between the constructs of teacher emotional experience and questions in the survey questionnaire.

TABLE II
CRITERIA, INDICATORS AND CONSTRUCTS OF TEACHER'S EMOTIONAL EXPERIENCE

Construct	Sub-construct	Question in the survey questionnaire
Social interaction	Participation in the activity	How long have you been teaching online?
	Exchange ideas with others and co-operation with others	Do you think there is a difference between online teaching for children and for adults?
	Analysis of a problem	Did you feel apprehensive in any way about starting the transition to online classes?
	Are in the dialogue and Search for problem solving tools together with others	Do you know how your learners perceive your emotions in online classes?
Cognitive activity	Regulation of his/her own learning process	Do you think about your emotions before starting your online classes?
	Setting his/her own goals	What skills should teacher in online classes have?
	Taking responsibility for his/her own learning	What have been the main difficulties in adapting to online classes?
	Working independently	What have you learned during this process of adapting to online classes?
	Evaluation of his/her own learning process and continuation of the improvement of his/her own skills	Do you consider that training in emotional skills is necessary for online teaching?

The empirical study was carried out in April 2022. The respondents represented teachers in adult education in the selected European countries, namely Germany, Italy and Greece. In total, 78 respondents took part in the study: 30 respondents from Germany, 28 respondents from Greece, and 20 respondents from Italy. The respondents work remotely in formal and non-formal adult education.

The collected data were ranked [23]. Ranking in adult education is implemented for the analysis of quality and productivity [24]. Ranking refers to an evaluation of online classes used for the advancement of the evaluated online classes [23]. By ranking, the act of summing up one's judgment of a performance or person into a single, holistic number or score is meant [25].

Table III shows the respondents' experience in online teaching.

TABLE III
RESPONDENTS' EXPERIENCE IN ONLINE TEACHING (WITH N = NUMBER OR RESPONDENTS)

Experience in online teaching	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
2 and more years	30	100	13	65	6	21	49	1
1-2 years	0	0	6	30	6	21	12	2
Less than 1 year	0	0	1	5	16	58	17	3

TABLE IV
RESPONDENTS' APPREHENSIVENESS TO START ONLINE TEACHING

Level of teacher apprehensiveness	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
Low	25	83	10	50	14	50	49	1
Medium	5	17	0	0	5	18	10	3
High	0	0	10	50	9	32	19	2

Table IV reflects the respondents' apprehensiveness about starting the transition to online classes and online teaching.

Table V reveals the main difficulties experienced by the respondents when adapting to online teaching. Table VI discovers the respondents' opinion on the difference between online teaching for children and adults.

TABLE V
RESPONDENTS' MAIN DIFFICULTIES IN ONLINE TEACHING

Difficulty	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
Technical issues (Internet connection, etc)	0	0	3	15	9	32	12	3
Methodical problems (online teaching materials, learners' engagement)	30	100	14	70	9	32	53	1
Teacher qualification problems	0	0	3	15	10	36	13	2

TABLE VI
RESPONDENTS' OPINION ON THE DIFFERENCE BETWEEN ONLINE TEACHING FOR CHILDREN AND ADULTS

Respondents' opinion	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
Different	30	100	15	75	24	85.7	69	1
No different	0	0	5	05	3	10.7	8	2
Do not know	0	0	0	0	1	3.5	1	3

Table VII discloses the respondents' view on the teachers' skills needed for online teaching in adult education. Table VIII gives an overview of the respondents' replies on their thinking about their emotions before an online class. Table IX points the respondents' assumptions if learners recognize their teachers' emotions in an online class. Table X presents the respondents' beliefs on the necessity of training in emotional skills for online teaching.

TABLE VII

RESPONDENTS' VIEW ON THE TEACHERS' SKILLS FOR ONLINE TEACHING								
Skills	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
Technical/digital	23	76.67	9	45	11	39.2	43	1
Didactic including communication	7	23.33	10	50	11	39.2	28	2
Learning to learn including patience	0	0	1	5	6	21.4	7	3

TABLE VIII

RESPONDENTS' ANSWERS ABOUT THEIR THINKING OF THEIR EMOTIONS BEFORE AN ONLINE CLASS								
Respondents' reply	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
Thinking	0	0	17	85	8	28.5	25	2
Not thinking	30	100	3	15	20	71.5	53	1
Do not know	0	0	0	0	0	0	0	3

Table XI presents what the respondents have learnt in the process of adapting to online teaching. Table XII summarizes the results of the empirical study. For the summary of the results of the empirical study, the responses that received the majority of answers and ranked with 1 are only considered.

TABLE IX

RESPONDENTS' ANSWERS ABOUT THEIR THINKING OF THEIR EMOTIONS BEFORE AN ONLINE CLASS								
Assumption	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
Recognize	6	20	10	50	13	46	29	2
Do not recognise	0	0	5	25	12	43	17	3
Do not know	24	80	5	25	3	3	32	1

TABLE X

RESPONDENTS' BELIEFS ON THE NECESSITY OF TRAINING IN EMOTIONAL SKILLS FOR ONLINE TEACHING

Assumption	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
Needed	3	10	16	80	21	75	40	1
Not needed	27	90	4	20	7	425	38	2
Do not know	0	0	0	0	0	0	0	3

TABLE XI

RESPONDENTS' ANSWERS WHAT THEY HAVE LEARNED IN THE PROCESS OF ADAPTING TO ONLINE TEACHING

Skills	Germany		Italy		Greece		Total number of respondents	Ranking
	N	%	N	%	N	%		
Technical/digital	0	0	10	50	8	28.5	18	2
Didactic including communication	30	100	10	50	20	71.5	60	1
Learning to learn including patience	0	0	0	0	0	0	0	3

TABLE XII

THE SUMMARY OF THE RESULTS OF THE EMPIRICAL STUDY

Construct	Sub-construct	Question in the survey questionnaire	Prevailing responses
Social interaction	Participation in the activity	How long have you been teaching online?	The majority of the respondents have been teaching online for 2 and more years.
	Exchange ideas with others and co-operation with others	Do you think there is a difference between online teaching for children and for adults?	The majority of the respondents point that there is a difference in online teaching for children and adults.
	Analysis of a problem	Did you feel apprehensive in any way about starting the transition to online classes?	The majority of the respondents opine a low level of apprehensiveness when starting the transition to online classes.
	Are in the dialogue and Search for problem solving tools together with others	Do you know how your learners perceive your emotions in online classes?	The majority of the respondents does not know about the learners' perception of their teachers' emotions.
Cognitive activity	Regulation of his/her own learning process	Do you think about your emotions before starting your online classes?	The majority of the respondents does not think of their emotions before starting their online classes.
	Setting his/her own goals	What skills should teacher in online classes have?	The majority of the respondents consider technical and digital skills to be crucial for a teacher in online classes.
	Taking responsibility for his/her own learning	What have been the main difficulties in adapting to online classes?	The majority of the respondents stress that the main difficulty in online teaching is methodical issues.
	Working independently	What have you learned during this process of adapting to online classes?	The majority of the respondents have improved their didactic skills including communication.
	Evaluation of his/her own learning process and continuation of the improvement of his/her own skills	Do you consider that training in emotional skills is necessary for online teaching?	The majority of the respondents needs training in emotional skills for online teaching.

Table XIII gives an overview of the respondents' emotional experience to be further enhanced in training for teachers who provide online teaching.

The analysis of the elements of the respondents' emotional experience allows finding out that teachers' attitude to online classes has to be developed.

IV. CONCLUSIONS

The theoretical findings allow identifying teachers' emotional experience as an individual combination of abilities as well as knowledge, skills and attitude based on individual's social interaction and cognitive activity to understand,

recognize and manage own and other people's signs aimed at decision-making in various life situations for social adaptation, conflict-and stress resistance, resilience and world outlook.

The empirical results allow concluding that teachers who provide online classes need training in developing of their attitude to online teaching.

Implications for training of teachers who deliver online classes are formulated as following:

1. Teachers' analysis of their own emotions,
2. Teachers' analysis of their learners' emotions,
3. Methodical aspects of online teaching, and
4. Technical and digital skills for online teaching.

The limitations of the study are the involvement of only

respondents who are adult teachers from selected European countries.

TABLE XIII
THE SUMMARY OF THE RESULTS OF THE EMPIRICAL STUDY

Experience element	Sub-construct	Prevailing responses	Need in training
Knowledge	Exchange ideas with others and co-operation with others	The majority of the respondents point that there is a difference in online teaching for children and adults.	No
	Analysis of a problem	The majority of the respondents opine a low level of apprehensiveness when starting the transition to online classes.	No
Skills	Are in the dialogue and Search for problem solving tools together with others	The majority of the respondents does not know about the learners' perception of their teachers' emotions.	Yes
	Setting his/her own goals	The majority of the respondents consider technical and digital skills to be crucial for a teacher in online classes.	Yes
	Taking responsibility for his/her own learning	The majority of the respondents stress that the main difficulty in online teaching is methodical issues.	Yes
	Participation in the activity	The majority of the respondents have been teaching online for 2 and more years.	No
	Working independently	The majority of the respondents have improved their didactic skills including communication.	No
Attitude	Regulation of his/her own learning process	The majority of the respondents does not think of their emotions before starting your online classes.	Yes
	Evaluation of his/her own learning process and continuation of the improvement of his/her own skills	The majority of the respondents needs training in emotional skills for online teaching.	Yes

Further work intends to widen the study sample by engaging adult learners as well as other stakeholders. Development of training curricula are to be designed and piloted.

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REFERENCES

- [1] J. Zascierinska, A. Aleksejeva, L. Aleksejeva, N. Andreeva, O. Gloņina, M. Zascierinskis, *E-Learning in Non-Formal Adult Education in Latvia: Context Analysis*. Verlag: Mensch & Buch. 160 pp, 2015. ISBN: 978-3-86387-645-6.
- [2] H. Ramar, J. Zascierinska, *Six Sigma: A New Trend in Educational Research. A Comprehensive Approach with Case Studies*. GlobeEdit. 124 p., 2015. EAN: 9783639824605. <https://www.globeedit.com/system/covgenerator/build/415>.
- [3] J. Zascierinska, A. Ahrens, E-business Applications to Students' Blended Learning in Higher Education. In Mohammad S. Obaidat, Jose Luis Sevillano, Zhaoyang Zhang, Dacid Marca, Marca van Sinderek, Panagiotis Sarigiannidis, Piero Castoldi and Victor Torres-Padrosa (Eds), *Proceedings of the 4th International Conference on Data Communication Networking (DC NET 2013), 10th International Conference on e-Business (ICE-B 2013) and 4th International Conference on Optical Communication Systems (OPTICS 2013)*, Reykjavik, Iceland, 29-31 July 2013, pp. 290-297. Publisher: SciTePress - Science and Technology Publications. Printed in Portugal.
- [4] J. Zascierinska, A. Aleksejeva, M. Zascierinskis, O. Gukovica, L. Aleksejeva, I. Abjalkiene, Mixed Class Teaching as an Emerging Trend Accelerated by COVID-19. *Education. Innovation. Diversity*, 2(3), 53-65, 2021. DOI: <https://doi.org/10.17770/eid2021.2.6720>
- [5] A.N. Leont'ev, *Activity, Consciousness, and Personality*. Prentice-Hall. 8 p., 1978. Retrieved from <http://marxists.org/archive/leontev/works/1978/ch5b.htm>
- [6] S. Mengqi. A Study on the Academic Emotion of Primary School Students in China. *Proceedings of the 20th International Scientific-Practical Conference*, pp.294-297, 2021. – ISBN 978-5-94051-258-5.
- [7] A. Ahrens, J. Zascierinska, The Emotions in Light of Vygotsky and Leontiev's Work: Notions, Features and Functions. *Regional Formation and Development Studies Journal of Social Sciences*. Klaipeda: Klaipeda University Faculty of Social Sciences and Humanities, 2022. ISSN 2029-9370. (accepted for publication).
- [8] S. Gilmore, S. Warren. Themed article: Emotion online: Experiences of teaching in a virtual learning environment. *Human Relations*. 2007;60(4):581-608. doi:10.1177/0018726707078351
- [9] D. Naylor, J. Nyanjom, Educators' emotions involved in the transition to online teaching in higher education, *Higher Education Research & Development*, 40:6, 1236-1250, 2021. DOI: 10.1080/07294360.2020.1811645
- [10] European Commission, *Adult Learning Initiatives*, 2022. Retrieved May 20, 2022 from <https://education.ec.europa.eu/education-levels/adult-learning/adult-learning-initiatives>.
- [11] W. Jantzen, Understanding emotions and emotional development. A Vygotskian approach. *Project: „Philosophie, Soziologie und (Neuro-)Psychologie der Intersubjektivität“*, 2022. Retrieved from https://www.researchgate.net/publication/335700978_Understanding_emotions_and_emotional_development_A_Vygotskian_approach.
- [12] I. Maslo, Skolotāju sociālintegrējošās darbības modelēšana [Skolotāju sociālintegrējošās darbības modelēšana]. In: I. Maslo, *No zināšanām uz kompetentu darbību [From knowledge to competent action]*, 35.-44. lpp. Rīga: Latvijas Universitātes Akadēmiskais apgāds. 186 lpp, 2006.
- [13] De Vierville, J.P. *Emotion*. Electronic library of Waikato University, 1999.
- [14] I. Burkitt, The Emotions in Cultural-Historical Activity Theory: Personality, Emotion and Motivation in Social Relations and Activity. *Integr. psych. behav.* 55, 797–820 (2021).
- [15] NHS Fife Department of Psychology, *Emotion Regulation: Managing Emotions*, 2016. Retrieved from https://www.moodcafe.co.uk/media/15343/ER_handout_Final_16_June_2016%20pdf.pdf
- [16] J. R. Averill, A constructivist view of emotion. In Plutchik, R., Kellerman (Eds), *Emotion: Theory, research and experience*, Vol. 1, pp. 305-339. Academic Press, New York, 1980.
- [17] V. G. Karimova, A. M. Pan'kova, R. A. Valiev. Features of Emotional Intelligence of Students of Pedagogical and Medical Universities. *Proceedings of the 20th International Scientific-Practical Conference*, pp.162-165. – ISBN 978-5-94051-258-5, 2021.
- [18] A. Ahrens, J. Zascierinska, A Comparative Analysis of Educator's and Peers' Influence on Students' Attitude to Mobile Social Media in Distance Learning. *Literacy Information and Computer Education Journal (LICEJ)*, Volume 6, Issue 1, March 2015, pp. 1311-1320. ISSN: 2040 2589 (Online), <http://www.infonomics-society.org/LICEJ/Contents%20Page%20Volume%206%20Issue%201>.
- [19] I. Žogla, Mūsdienu mācību teorijas problēmas. [Problems of Modern Educational Theories]. *Skolotājs Nr. 45/2001* (4.-7. lpp). Rīga: RaKa.
- [20] Beļickis, I., Blūma, D., Koķe, T., Markus, D., Skujiņa, V., (vad.) & Šalme, A. *Pedagoģijas terminu skaidrojošā vārdnīca. Termini latviešu, angļu, vācu, krievu valodā. [Dictionary of Pedagogical Terms. Terns in Latvian,*

- English, German, Russian*. Rīga: "Zvaigzne ABC", 2000.
- [21] I. Maslo, Introduction. In: I. Maslo (Ed). *No zināšanām uz kompetentu darbību, [From knowledge to competent action]*, 13.-19. lpp. Rīga: Latvijas Universitātes Akadēmiskais apgāds. 186 lpp, 2006.
- [22] E. Maslo, Transformative Learning Space for Life-Long Foreign Languages Learning. In: D.Cunningham, D.Markus, J.Valdmanis ... [u.c.] (Eds). *International Nordic-Baltic Region Conference of FIPLV Innovations in Language Teaching and Learning in the Multicultural Context* 15-16 June, 2007, Riga, Latvia, pp. 38-46. - Rīga: SIA "Izglītības solī", 2007. CD-ROM. 416 p, 2007.
- [23] A. Ahrens, J. Zascierinska, Comparison of Teacher's and Students' Ranking of English for Academic Purposes Sub-Topics. *Education. Innovation. Diversity*, 1(1), 16-25, 2020. DOI: <http://dx.doi.org/10.17770/eid2020.1.5328>.
<http://journals.rta.lv/index.php/EID/article/view/5328/4943>
- [24] A. Gonçalves, A. Ignacio Calderón, Academic rankings in higher education: trends of international scientific literature. *Rev. Diálogo Educ., Curitiba*, v. 17, n. 54, 1125-1145, 2017. DOI: <http://dx.doi.org/10.7213/1981-416X.17.054.DS03>
- [25] P. Elbow, "Ranking, Evaluating, Liking: Sorting Out Three Forms of Judgment." (1994). *College English*, 12, 1994. Retrieved from https://scholarworks.umass.edu/eng_faculty_pubs/12.
- [26] J. Zascierinska, (2021). Social Sciences' Transformation in Light of COVID-19. Education Reform: Education Content Research and Implementation Problems. Volume 1 (2021), pp. 7-18. Rezekne: Rezekne Academy of Technologies. DOI: <https://doi.org/10.17770/ee2021.1.6495>
- [27] A. Ahrens, J. Zascierinska, P. Bhati, M. Zascierinskis, A. Aleksejeva., Comparative Studies of COVID-19 Impact on Students' Views on Digital Higher Education. SOCIETY. INTEGRATION. EDUCATION. Proceedings of the International Scientific Conference. Volume V, May 28th-29th, 2021, pp. 17-29. Rezekne: Rezekne Academy of Technologies. DOI: <https://doi.org/10.17770/sie2021vol5.6277>.
<http://journals.rta.lv/index.php/SIE/article/view/6277/5172>.