STUDIA UNIVERSITATIS
BABEŞ-BOLYAI

PSYCHOLOGIA PAEDAGOGIA

2/2022

STUDIA UNIVERSITATIS BABEŞ-BOLYAI PSYCHOLOGIA-PAEDAGOGIA

Volume 67, Issue 2,
December 2022

STUDIA UNIVERSITATIS BABEŞ-BOLYAI PSYCHOLOGIA-PAEDAGOGIA
Web site: https://studiapsypaed.com/
Contact: studia.psiedu@gmail.com

YEAR **Volume 67 (LXVII) 2022**
MONTH **December**
ISSUE **2**

PUBLISHED ONLINE: 2022-12-05
PUBLISHED PRINT: 2022-12-30
ISSUE DOI:10.24193/subbpsyped.2022.2

S T U D I A

UNIVERSITATIS BABEŞ-BOLYAI PSYCHOLOGIA-PAEDAGOGIA

2

SUMAR – SOMMAIRE – CONTENTS – INHALT

STUDIA UBB PSYCHOL.-PAED., LXVII, 2, 2022, p. 5-23
(Recommended Citation)
DOI:10.24193/subbpsyped.2022.2.01

FALSE MEMORIES IN ONLINE MISINFORMATION EXPERIMENTAL CONTEXT

Andreea HOROIȚĂ[1], Adrian OPRE[2*]

ABSTRACT. In times of pandemic and afterwards, online platforms and settings have been intensively used. With the purpose of investigating how this setting affected our memory, recent studies have found that memory distortions are present in online environments as well. Therefore, the objective of the present research was to assess misinformation effect in online context, more specifically to assess misinformation effect using leading questions and suggestibility techniques in online format. Our results indicate the presence of misinformation effect through suggestibility, but not through leading questions. Theoretical and practical implications are discussed.

Keywords: misinformation effect; leading questions; suggestibility; false memories; eyewitness testimony; online context.

Introduction

Memory volatility has been explored for a long time and in various forms. Memory errors, also known as memory illusions or memory reconstructions, are now proven facts (Loftus, 1996; Deese, 1959; Roediger & McDermott, 1995) and state that our memory, as dependent as we all are of it, is not always accurate. A form of memory distortion, which was intensively studied, is misinformation effect, and some of the techniques used to explore this particular effect on memory were leading questions and suggestibility. Implications of memory

[1] Doctoral School of Applied Cognitive Psychology, Department of Psychology, Faculty of Psychology and Educational Sciences, Babes-Bolyai University, Republicii Street No. 37, 400015, Cluj-Napoca, Romania, andreeahoroita@gmail.com
[2] Department of Psychology, Faculty of Psychology and Educational Sciences, Babes-Bolyai University, Republicii Street No. 37, 400015, Cluj-Napoca, Romania, adrianopre@psychology.ro
* Corresponding author: adrianopre@psychology.com

research are always meaningful, as long as everyday functioning depends on memory use. Remembering is a psychological mechanism with important practical implications in a number of fields - psychology, education, law, social sciences, public health, healthcare, to name a few (Ecker et al., 2022). In the legal system, more specifically in the eyewitness testimony area, which is based entirely on memory, the testimony could impact the decision of 'guilty' or 'not guilty' of the accused or defendant, therefore impacts a person's course of life.

The misinformation effect refers to post-event information that alters the original memory of a specific event (Pickrell, Bernstein & Loftus, 2016). In the classical paradigm, participants first assist to an event, then they receive an incorrect information about the event they saw, through questions, photographs, suggestions etc, and afterwards they participate in a memory test regarding the event they initially saw. The effect is that the incorrect information is incorporated into the initial memory of the event (Loftus, 2005). In the original development of misinformation effect paradigm in a laboratory setting, the influence of the wording was used in post-event questions, which ultimately changed perception of the event and affected its original memory (Berkowitz & Loftus, 2018). After viewing videos or slides of an event, usually a car crash accident, participants asked in different wording about the event responded differently at specific questions regarding the initially presented slides or video (Loftus & Palmer, 1974). This technique is called leading questions (Loftus, 1996; Wells & Olson, 2003) and refers to questions asked by investigators, with content made of specific verbs, prepositions or specific words, which may lead to a desirable or leading witness's answer (Loftus, 1996). Experiments on leading questions mainly address the relation between verbs or prepositions and participants answers. In Loftus & Palmer experiment (1974), participants view a car crash short movie, and estimated a higher speed if the question was addressed with the verb "Smashed", than if the question was addressed with the verb "Hit". The effect of verbal labels on directions of change in memory, when visual stimuli are presented, has gained proves in other scientific studies as well (Daniel, 1972; Santa & Ranken, 1972; Lindauer, 1970; Loftus, Miller & Burns, 1978; Doyle & Lindquist, 2018; Huang & Awg, 2018). Therefore, wording can influence participants' answers (Loftus, 1975). How questions are formed counts in a series of answers, with high implications in the legal system. For example, the wording of a question can be accountable in people's answers through the use of prepositions (Loftus, 1974; Loftus & Zanni, 1975). In a research of Loftus and colleagues (1974, 1975), when participants were asked if they have seen 'the' broken headlight, in reverse with 'a' broken headlight, the preposition 'the' increased by almost 50% the false assumption that a broken headlight existed. In fact, no broken headlight was presented in the scene, but the question

leads to a false assumption that there was, and consequently to a false answer (Loftus, 1975). The replication of how specific different words from a question can lead to a specific different answer was also investigated by numerous researchers (Harris, 1973; Dodd & Bradshaw, 1980), which raised awareness among legal and non-legal researchers and a challenge to find solutions to this 'problem' (Swan, Giulianni & Weber, 1982; Geiselman et al., 1986; Pahre, 1999).

Suggestibility is also a technique used in misinformation effect research. Our memory becomes vulnerable and malleable at the influence of suggestions, and false or misinformed memories are stated from external suggestion (Nichols & Loftus, 2019). Misinformation paradigm contains three phases, and the second one implies suggestion or imagination of the incorrect information (Nichols & Loftus, 2019). Individual differences on suggestibility state that people who are prone to develop false memory from their past due to imagination or suggestibility, are also prone to present more false memories in a laboratory setting as well. The studies on repressed memories confirms this idea, for example women who recovered repressed memories had higher scores on false DRM memories in laboratory context (Clancy et al., 2000; Geraerts et al., 2005; Geraerts et al., 2009; as cited in Nichols & Loftus, 2019). Divided attention is also a factor to consider in suggested false memories in misinformation paradigm, for instance participants who have divided attention at encoding (Lane, 2006; as cited in Nichols & Loftus, 2019) and also at retrieval (Zaragoza & Lane, 1998; as cited in Nichols & Loftus, 2019), are more likely to incorporate misleading suggestions into their memory (Nichols & Loftus, 2019). Moreover, suggestion is harder to correct than directly stated misinformation (Reynolds, 2020). The latest studies presents suggestibility to be stronger in the case of false additive information than false contradictory information, older adults enabling fewer false contradictory misinformation than younger adults (Huff & Umanath, 2018).

Misinformation effect is a very robust phenomenon, which has been demonstrated in numerous studies, on various ages – infants, children, adults and elderly- and animal samples -gorillas, pigeons (Harper & Gary, 2000; Poole & Lindsay, 2001; Rovee-Collier, Borza, Adler & Booler, 1993; Schwartz, Meissner, Hoffman, Evans & Frazier, 2004; Wylie et al., 2014; as cited in Berkowitz & Loftus, 2018). Furthermore, misinformation effect appears even in the case of people with *highly superior autobiographical memory* (HSAM) (Parker, Cahill & McGaugh, 2006; as cited in Berkowitz & Loftus, 2018). The HSAM individuals correctly remembers details from their past with 97% accuracy (LePort et al., 2012, as cited in Berkowitz & Loftus, 2018). Nevertheless, they are not immune to misinformation effect, which also appears into their memories, as scientific experiments show (Patihis et al., 2013, as cited in Berkowitz & Loftus, 2018).

Authors explained this phenomenon as a memory-bias, memory impairment or memory reconstruction mechanism (Loftus, 2005). But how exactly does memory reconstruct reality?

The explanations provided for the misinformation effect includes theoretical framework. Initial explanation is that the first encoded memory trace is altered or overwritten by the false information given after the initial encoding process (Loftus, 1975, 1979; Loftus et al., 1978, apud Ayers & Reder, 1998). This assumption would imply that the first encoded trace disappears, and it's replaced with the false memory trace. But what if participants remember both informations, the first true one and the second misinformed one? Then we could argue, as cognitive psychologists also argue, the debate between single-trace versus multiple-trace memory, with more scientific arguments and proves for the multiple-trace memory theory (Chandler, 1991; Chandler & Gargano, 1995; Windschitl, 1996, apud Ayers & Reder, 1998). Participants encode the first true information about the event, but also the second false information, therefore multiple traces of one single event are created. McCloskey & Zaragoza (1985) strongly debates the single-trace explanation by arguing that if participants rewrite the first memory trace, then it would disappear or be forgotten, and participants wouldn't choose it at all. Their studies focused on a modified procedure, where participants had to choose in the recognition test between the first presented information and a new one. The false information was presented in the encoding phase, but wasn't an option in the recognition test. If the false information had altered the first correct encoded trace, consequently the first trace would have disappeared and would have been replaced with the second, false information. As a result, participants wouldn't have chosen the first trace, because of its replacement with the second trace stored in their memory. Results showed instead a major preference for the first, correct, information, both in control and the experimental, misinformed, group. Researchers strongly concluded that 'misleading information neither erases the original information, neither it renders it inaccessible' (McCloskey & Zaragoza, 1985). Secondly, misinformation effect is further explained with the activation-memory trace framework, which stipulates that multiple-activation in memory of the first or second, created, information is possible, and memory bias is given by the activation of the second, false information. The misleading information is easier to activate, because it was the last one encoded and stored, so the participants could choose it faster than the first trace, less activated in memory. Other participants could activate stronger the first information, which could explain participant's choice answers, who aren't always for the misleading response (Ayers & Reder, 1998).

This framework is consisted with Kelly and Jacoby (1996) findings, regarding source activation theory, which stipulates that when the source of the activation in memory is confusing, this could result in memory errors (as cited in Pickrell et al., 2016). Other possible explanations of the misinformation effect are task demands or strategic effects (Pickrell et al., 2016). Moreover, situational factors- for example the time given between the original event and the misleading information and the time between the misleading information and test- and internal factors – different psychological states, the level of intelligence of the subjects, the level of sleep deprivation, or the level of being sober- are definitely variables which lead to moderation of the misinformation effect (Zhu et al., 2010; Frenda, Patihis, Loftus, Lewis & Fenn, 2014; Assefi & Garry, 2003; as cited in Berkowitz & Loftus, 2018).

In real life settings, misinformation effects can occur through conversations, stories, mass-media, and also through social media or other online instruments. Nowdays, the effect of misinformation on memory is present also in virtual reality. The Pandemic has created an unprecedent situation, the one in which every social activity was moved online, and where misinformation was also present. Social media use was positively associated with misinformations belief regarding Covid-19 Pandemic (Su, 2021). The effects on memory in online setting still remain to be scientifically explored, but one thing is for certain: the created infodemic (abundance of correct and incorrect information) had consequences on memory also, after exposure to online misinformation, for example it could have changed our memory about how we feel like with the mask on after reading an article that showed how effective the masks are in protecting us from the virus (Greenspan & Loftus, 2020).

Research on misinformation effect in online context has just started to explore its consequences on memory. Sievwright and collaborators (2021) found misinformation effect in an online context, after participants have been exposed to a traumatic video online, and later were exposed to misinformed content regarding the traumatic video watched before. Their results demonstrate that misinformation effect appears also in online setting, in this particular case using exposure to traumatic video.

Our present study focuses on the same idea of context dependence factor. The general objective is to assess false memories in online setting, using misinformation effect paradigm as a theoretical background design, with no interviewer and demand pressure. More specifically, the objective is to assess, in an online setting, the misinformation effect using the classicals techniques- leading questions technique (Loftus & Palmer, 1974) and the suggestibility technique (Loftus, 2005) – through online format. Therefore, the first specific objective is to assess false memories through leading questions in online setting,

and the second specific objective is to assess false misinformed memories through suggestibility in online setting. Our hypothesis is that false memories will also be present in online misinformed setting, for both techniques.

Method

Participants

Participants were randomly divided in two groups. The total number of participants were N=201. For the first Group, N=102, the Mean age was M_{age}=23.19, SD=5.83, and for the second group, N=99, the Mean age was M_{age}=22.04, SD=6.56. They all signed the Informed Consent form, which was created according to the International Ethical Standards in research field. They were told that this is a research study and if they participate, they have the chance to gain 50 euros at the end of the study. When the collected data were finished, a participant was chosen, using the site random.org, to collect the promised reward.

Instruments

The study was done through online access, and was distributed via social networks, especially via students groups from Facebook. All participants had to access a Google link, where they have been presented with a video of a car crash, made after a replication of the initial car crash video from Loftus & Palmer (1974), and pictures of two random damaged cars. All the leading questions and the suggested descriptions were presented in the Google Link. Their answers were recorded in the same Google link.

Procedure

In the first section participants were briefly informed about the study, and they were asked to read and agree to the Informed Consent form. After their agreement, they were asked questions regarding their age and e-mail address. The next section in the Google link asked the participants to carefully watch a video. The video was a car crash replication video from the main car crash experiment (Loftus & Palmer, 1974), with a duration of 14 seconds. The video replicated a car crash in which a blue car ignored an intersection and collided with a gray car. The main road where the accident occurred in the video had also a Yield sign. Those 14 seconds show only the collision between the blue car and the gray car, with a Yield sign in the intersection, on the main road.

After watching the video, in a separate section, the participants were asked several questions. Group 1 of participants was asked 'Which is the approximated speed of the blue car when it SMASHED into the gray car?', and participants from Group 2 were asked 'Which is the approximated speed of the blue car when it HIT the gray car?'. The separate sections in a Google form doesn't allow the participant to go back and watch the video film again. The method of collecting the answers for the leading questions was a force-choice option. Both groups of participants were offered the option to choose from 30km/h, 40km/h and 50 km/h. A second question for each group, in the same Google section, was 'Did you see The Stop Sign in the video?', even though there wasn't a Stop sign in the video, but a Yield sign. Both groups answered through a force-choice method, with YES or NO as options for this particular question.

In the next phase, we have introduced a misinformed suggestion to asses for misinformation effect. Two Pictures of two blue crashed cars, that had no connection with the car crash from the previous video, were presented in a separate Google section. The first Picture, A, was composed of a slightly crashed blue car, with accident marks on the frontal side of the car. The second Picture, B, presented a seriously damaged crashed blue car, with visible marks in the same frontal side of the car. The two cars were different in brands, but for the second car the brand wasn't visible because of the damages. Participants were asked to describe the pictures. A suggestive example was offered. Group 1 received the following question: 'Please describe the next Pictures. For example "Picture 1 –smashing the blue car with the gray one" ', and for Group 2 the same example, but the verb 'smashing' was replaced with the verb 'hitting'. Participants had to describe each Picture through a short text.

We had expected to find a slightly different misinformation effect between the two groups and the two pictures, for Group 1 to find a more pronounced effect in Picture B (where the car was more damaged, considering they received the suggestion containing the verb 'smashed') and for Group 2 a higher misinformation effect in Picture A (where the car was slightly damaged, and they received the suggestion containing the verb 'hitting').

Results

Each section was analyzed independently, therefore the misinformation effect was analyzed separately for the leading questions and for the suggestibility technique, in online context.

Leading questions

Results for the car crash experiment were analyzed using an independent t-test analysis. The independent variable consisted in the bias verbs ('Smashed' and 'Hit'), and the dependent variable was the speed chosen by the participants. Results showed no statistical differences for the speed between the two groups (p=.517, significant at p≤0. 05). Table 1 shows the speed means and standard deviations for both verbs. Fig.1 shows the graphic mean proportions for each of the three options of speed. The middle position, 40km/h, had the most chosen answer in both groups, especially in the 'Smashed' group.

Table 1. Means and Standard Deviations of Chosen Speed for Each Group

Verb	M	SD
Smashed	40.58	7.28
Hit	39.89	7.75

M=Mean; SD= Standard Deviation.

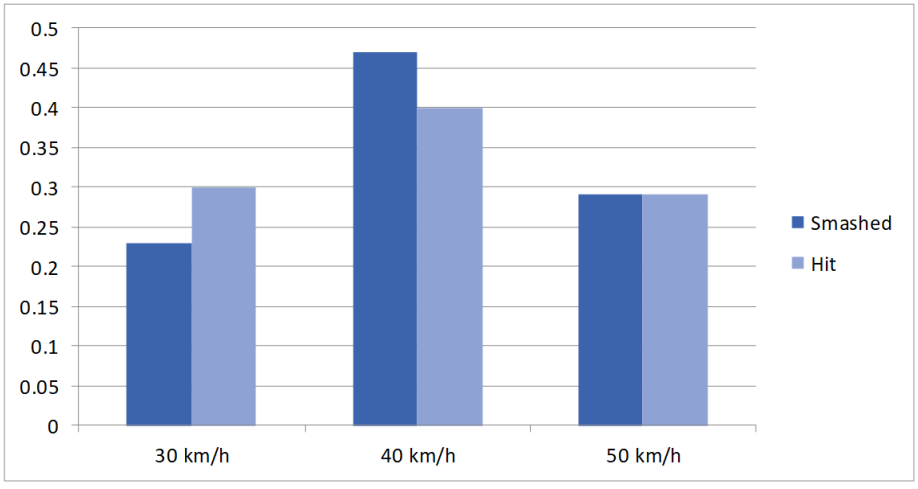


Fig. 1 – Mean proportions for each speed in both groups.

Participants tend to choose the middle speed estimation, 40 km/h, not the highest -50 km/h- or the lowest -30 km/h- speed estimation, regardless of the verb used in the question.

The Stop sign was seen by 0.09% of participants in the 'Smashed' group and 0.07% of participants in the 'Hit' group. So the probability, P (Y), to answer Yes to the question 'Did you see The Stop Sign when the cars smashed/hit each other?' is .09 for the verb 'Smashed', and .07 for the verb 'Hit'. An independent Chi-Square test indicated no significant results between the two groups, *Smashed* and *Hit*, for the participants that answer with Yes and No to the questions 'Did you see The Stop Sign in the car crash video?'.

Misinformation effect

In this part of the experiment, we wanted to assess if a misinformed suggestion example will lead to a false response in describing the photos, or a misinformation effect, in online setting. Participants from each group described first Picture A, then Picture B. The design was 2 (picture A X picture B) X 2 (group 1 X group 2). In order to have a quantitative analysis, responses were marked with 1 for false responses, 2 for neutral responses and 3 for correct responses. Means and standard deviations for responses are presented in Table 2. Fig 2 displays the chart representations of the responses.

Table 2. Mean proportions of the answers for each Picture and each Group

	Group 1 ('Smashed' as a verb')				**Group 2 ('Hit as a verb')**					
	Picture A		**Picture B**		**Picture A**		**Picture B**		**Total Responses**	
	M	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
False Responses	.19	.40	.19	.40	.22	.42	.19	.40	.19	.01
Neutral Responses	.33	.47	.36	.48	.31	.47	.30	.46	.32	.02
Correct Responses	.47	.50	.44	.50	.46	.50	.50	.50	.46	.02
Total Average	.33	.14	.33	.13	.33	.12	.33	.15	.32	.13

M= Mean; SD= Standard Deviation; *in brackets: Standard Deviations*

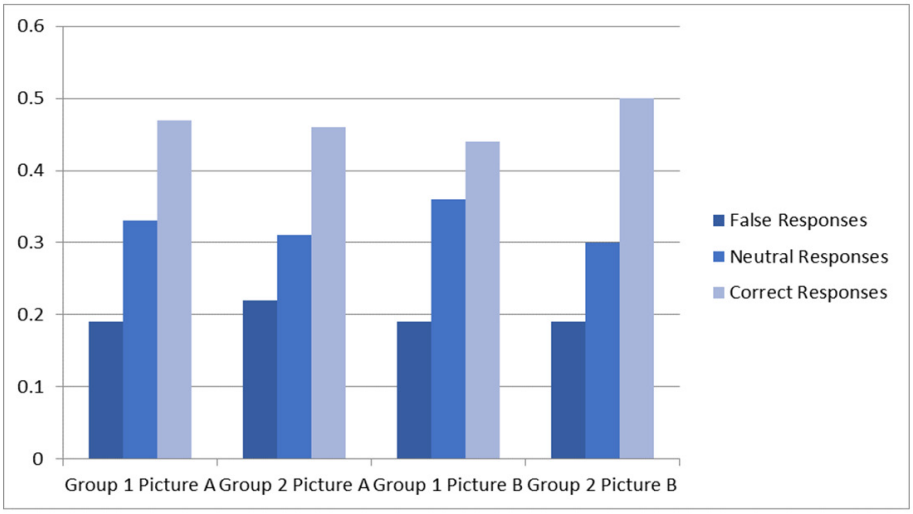


Fig. 2: Graphical representation of mean proportion of false, neutral and correct responses, for each Picture and Each Group.

A repeated measures two way Anova indicated a non-significant difference between the within-subjects variable, Picture A and B, and for between-subjects factor, Group 1 and 2 (1- 'Smashed', 2- 'Hit'), as a result of suggestive examples.

However, a One-way Anova resulted in a statistical significance effect between mean proportions of false, neutral and correct responses, F (2,9) = 141.242, p=.000, significant at p≤0. 01. Post-Hoc Tukey test indicates significant mean differences between neutral and false responses (M= .13, SD= .01), correct and neutral responses (M= .14, SD= .02), and correct and false responses (M= .27, SD= .02), p= .000, significant at p≤0. 01.

Results indicate no misinformation effect in leading questions through online setting/instruments. However, misinformation effect was present in the participants answers in describing the pictures, which in fact weren't part of the car crashed they watched before. The hypothesis that a higher effect will appear in Picture B for Group 1 and Picture A for Group 2 wasn't confirmed.

In conclusion, the results suggests than when given a certain suggestive example for a specific description, that suggestion, often false, becomes incorporated in people's responses, even in online context.

Discussions

Results indicate that in virtual or online setting, no influence of the verb on speed estimation exists. There is also no influence of the preposition 'the' on false memory of a Stop sign. In conclusion, in an online setting, a leading question could, indeed, not produce a leading effect. A possible explanation for the lack of any significant differences could also be the given estimated speed choices, 30-40-50km/h, which were too close in values and resulted in a median value of 40km/h. Maybe in the case of longer estimated speed distance value (for example 30-60-80 km/h), results would have been different. In the original study of Loftus & Palmer (1974), which took place in laboratory setting, open-ended responses of the participants were used, allowing the participants to estimate the speed, therefore the group for 'Smashed' verb has estimated a higher speed (40.8mph) than the participants in the 'Hit, Collied, Bumped, Contacted' verb group (31.8mph).

An online setting requires the absence of an interviewer, the absence of a spoken demand to answer the question. For our experiment, no spoken verbal label was addressed, participants read the verbal label (cars 'smashed', cars 'hit') and estimated the speed based on the memory of the collision, which they saw in the video. Another possible explanations for a lack of significant results could be the simplified procedure used in online setting, versus the slides presentation, more detailed procedure, used in normal setting (Loftus & Palmer, 1974; Loftus, 1975).

A verbal label directs attention of subjects and can produce changes in memory (Daniel, 1972), but for significant changes there is also a need of suitable sets of alternative labels or forms, and a delay time between the encoding and the memory test (Daniel, 1972; Santa & Ranken, 1972). Loftus and Palmer's experiment (1974) presents sets of alternative verbal labels, four types of verbs –smashed, collided, bumped, hit, contacted- which all participants were exposed to. The lack of spoken verbal label, the lack of sets of alternative forms of verbal label and the lack of time delay could be possible explanations for insignificant differences in online verb-speed estimation. Therefore, the change of independent variables opens the possibility to find significant misinformation effect in online context as well.

Another possible explanation could be that all participants responded through a force-choice test. If a free answer test were to be given instead, would that change the results? The difference between force-choice and free test in scientific literature is that force-choice test can lead to more correct responses (Macmillan & Creelman, 2004).

The demand characteristics of the experimental situation is another suitable explanation for the present results. In the present context, participants were in front of a virtual reality, with no spoken demand, reading by themselves all the instructions and answering as a result of reading instructions. In previous leading questions's experiments (Loftus & Palmer, 1974; Loftus, 1975; Loftus, Miller & Burns, 1978), participants were read aloud the instructions by an experimenter, and asked to answer the questions by an experimenter as well, therefore the influence of a social actor had been noticed. In online setting, there is no social need to confirm the interviewer beliefs, in order to obtain a social reward, because there is no interviewer. Also, in virtual setting no 'relatively high-speed answer' is required or indirectly perceived as required, for the purpose of being seen as a 'perceptive observer' by the interviewer, because there is no interviewer. Those demand explanations were observed by Loftus & Loftus (1980) as well. The present experiment, with online experimental characteristics, excludes demand characteristics as perceived social pressure, which could also be a possible cause for the lack of any found influnce of verbs on speed estimation.

Results also indicate that misinformation effect is possible in online setting as well, even though there is no interviewer and no demand pressure. The suggestive examples, primed with verbs 'Smashed' and 'Hit', mislead the participants to falsely describe Pictures A and B as beeing part of the online car crash previously presented. The Pictures had no real connection with the car crash presented in the video, but participants were mislead to think that they are connected through the suggested example used by the experimenter. The verbs, 'Smashed' and 'Hit', also appeared in their responses. Results indicated, however, no significant difference between misinformation effect of the interaction of groups and pictures, which can be interpreted that the wording didn't had a significant impact on participants false memory, and this is consistent with the no effect of wording found in section 1 -leading questions- of the present study. However, the tendency was for the misinformation effect to be higher in the pictures which better described the priming verb, Picture B for Group 1 ('Smashed' verb) and Picture A for Group 2 ('Hit' verb). Therefore, more research is need it to investigate the influence of wording in online setting for the misinformation effect.

Our study's results indicate misinformation effect in online setting throughout suggestive examples, and is concordant with multiple-trace theory (Nadel & Moscovitch, 1997), activation-based framework (Ayers & Reder, 1998) and source-monitoring framework (Kelly & Jacoby, 1996). The first trace, car crash video, activated through priming verbs ('Smashed' and 'Hit'), is incorporated in participants free answers, as well as the second trace, the false

suggested example that 'Pictures represents the cars from previous video'. Both traces are activated in the example given by the experimenter, 'the blue car smashed/hit the gray car'. Some participants falsely choose freely to express in pictures' description both traces, some of the participants expresses only one trace or some participants none. The majority of their answers are correct, or neutral, but between false and correct or neutral response there is a statistically significant differences, which means that false suggestive example were indeed incorporated in subjects answers, but still the majority of them did not falsely remembered the suggestive examples. A possible explanation is that maybe both traces are encoded and stored in memory, both traces were activated through the suggestive example, and confusion of activated sources (the pictures or the video primed with suggestive example) leads to memory errors. Nevertheless, the proportion of participants that gave the false responses is the smallest from the sample, and this is an aspect that is important to take into consideration when interpreting results in misinformation effect, because misinformation effect, although present, occurs in the smallest proportion from the sample.

Limits of the present study concern the lack of a control group. Groups were formed according to verbs, 'smashed' and 'hit', in order to asses false memories effect as a consequence of leading questions and suggestibility in misinformation paradigm. The present research focus on evaluating leading questions, and misinformation effect in an online setting, with no interviewer present and no verbal demand. Results clearly show the presence of misinformation effect, but the lack of distorted responses on leading questions.

Misinformation effect in online context gained attention and was also observed in other studies as well. Our results are consistent with results found in Del Vicario et al (2016), Nguyen et al (2012), Nguyen et al (2013), Shao et al (2018), Siewright et al. (2021), to name a few. Online media and social media, through rumor spreading, can create misleading information and divert any news in misleading information (Greenspan & Loftus, 2020). Some authors stipulate that homogeneity and polarization are the main determinants in predicting cascade's size in a misinformation effect (Del Vicario et al., 2016).

The impact of misinformation effect can be observed in real life context. As a practical implication, The Innocence Project, for example, estimated around 60% of false eyewitness identifications. The consequence was around 60% of erronated convictions (Innocence Project, 2021, as cited in Stoll, 2021). However, misleading informations are around us nowadays frequently, the internet and social media has become an exponential challenge because the increase in misinformation is higher and the audience is particularly targeted (Ecker et al., 2022). Therefore, misinformation effect has great

impact and implications, not only in the legal field, but also in everyday social interaction, that can result in everyday eronated decisions or poor communication. If a perception is formed through a false assumption, for example, which was created by a misleading information, the misinformation effect has great impact on that specific perception, which could lead to a specific eronated decision or to a spread of the misinformation effect. People's attention when sharing information is not focused on accuracy, which is the main reason of sharing misinformation (Pennycook et al., 2021). Moreover, misinformation effect is very persistent, especially if it's communicated implicitly (Reynolds, 2020).

Conclusions and future research directions

Implications of memory errors assessment for online communication address the role and impact of highly used online and media tools for learning purposes or for simple communication use. Nowdays, online setting has proved highly usefull in large domains, including in therapeutical interventions. Therefore, it is important to explore and know the effects or the implications for memory when working with online methods.

In conclusion, can we stipulate that online leading questions are, in fact, not misleading? More research is required in this type of experimental context, with the same variables involved, and maybe the same procedure. Future research could also investigate the effect of changing procedures in online leading questions experiments.

Implicit memory for altered memory events is a genuine fact to consider in further research as well, through online tools, because it raises doubts about unintentional altered effects of human memory. Source-monitoring framework displays source memory as an attribution, which consists of both conscious and unconscious processes (Zaragoza, Belli & Payment, 2007). Cognitive unconscious, defined as a failure of introspection (Opre, 2012), can and does confound memory sources, or activate memory traces.

Future research could also explore the adaptive role of implicit memory distortions, and the mechanism underlying misinformation effect and implicit memory distortions in online setting. Moreover, how misinformation contributes in the decision-making process could also be a line of future research, given that scientific quest on decisions implies emotional, cognitive, contextual and hormonal approach (Heilman, 2006). Memory distortions can also be investigated in further reasearch of short-term memory effect or metamemory effects (Visu-Petra, Cheie & Benga, 2008) or in assesing the effects of perceived well-beeing in school (Opre, Pintea, Opre & Bertea, 2018).

Future reasearch could also investigate the role of implicit memory distortions in information-processing mechanism (David, Miclea & Opre, 2004). However, implicit memory distortions could also have a possible cause or effect in expressing implicit emotional traits and behaviours (Jurchis, Costea, Dienes, Miclea & Opre, 2018), and in evaluating the perceived effect of cognitive-behvioral therapies (Jurchis & Opre, 2016; 2018; Jurchis, 2018), which are using online methods. Assesing the distinction between implicit and explicit memory distortions, in virtual reality or online learning, could also be a future line of reasearch (Voinescu & David, 2019).

Acknoledgements

This study was possible through research fellowship provided by the Doctoral School of "Applied Cognitive Psychology", Department of Psychology, Faculty of Psychology and Educational Sciences, Babes-Bolyai University.

REFERENCES

Berkowitz, S. R., & Loftus, E. F. (2018). Misinformation il the Courtron. In Otgaar, H., & Howe, M. L. (Eds). Finding the truth in the courtroom: Dealing with deception, lies, and memories. (pp. 11-30). New York, NY: Oxford University Press.

Chandler, C. C. (1991). How memory for an event is influenced by related events: Interference in modified recognition tests. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *17*(1), 115. DOI: https://doi.org/10.1037/0278-7393.17.1.115

Chandler, C. C., & Gargano, G. J. (1995). Item-specific interference caused by cue-dependent forgetting. *Memory & cognition*, *23*(6), 701-708. DOI: https://doi.org/10.3758/BF03200923

Daniel, T. C. (1972). Nature of the effect of verbal labels on recognition memory for form. *Journal of Experimental Psychology*, *96*(1), 152. DOI: https://doi.org/10.1037/h0033486

David, D., Miclea, M., & Opre, A. (2004). The information-processing approach to the human mind: Basics and beyond. *Journal of Clinical Psychology*, *60*(4), 353-368. DOI: https://doi.org/10.1002/jclp.10250

Deese, J. (1959). On the prediction of occurrence of particular verbal intrusions in immediate recall. *Journal of experimental psychology*, *58*(1), 17. DOI: https://doi.org/10.1037/h0046671

Deese, J. (1959). Influence of inter-item associative strength upon immediate free recall. *Psychological Reports*, *5*(3), 305-312. DOI: https://doi.org/10.2466/pr0.1959.5.3.305

Del Vicario, M., Bessi, A., Zollo, F., Petroni, F., Scala, A., Caldarelli, G., ... & Quattrociocchi, W. (2016). The spreading of misinformation online. *Proceedings of the National Academy of Sciences*, *113*(3), 554-559. DOI: https://doi.org/10.1073/pnas.1517441113

Dodd, D. H., & Bradshaw, J. M. (1980). Leading questions and memory: Pragmatic constraints. *Journal of Verbal Learning and Verbal Behavior*, *19*(6), 695-704. DOI: https://doi.org/10.1016/S0022-5371(80)90379-5

Doyle, C. M., & Lindquist, K. A. (2018). When a word is worth a thousand pictures: Language shapes perceptual memory for emotion. *Journal of Experimental Psychology: General*, *147*(1), 62. DOI: https://doi.org/10.1037/xge0000361

Ecker, U. K., Lewandowsky, S., Cook, J., Schmid, P., Fazio, L. K., Brashier, N., ... & Amazeen, M. A. (2022). The psychological drivers of misinformation belief and its resistance to correction. *Nature Reviews Psychology*, *1*(1), 13-29.

Geiselman, R. E., Fisher, R. P., Cohen, G., Holland, H., et al. (1986). Eyewitness responses to leading and misleading questions under the cognitive interview. *Journal of Police Science & Administration, 14*(1), 31–39.

Graf, P., & Schacter, D. L. (1985). Implicit and explicit memory for new associations in normal and amnesic subjects. *Journal of Experimental Psychology: Learning, memory, and cognition*, *11*(3), 501. DOI: https://doi.org/10.1037/0278-7393.11.3.501

Greenspan, R. L., & Loftus, E. F. (2021). Pandemics and infodemics: Research on the effects of misinformation on memory. *Human Behavior and Emerging Technologies*, *3*(1), 8-12.

Harris, R. J. (1973). Answering questions containing marked and unmarked adjectives and adverbs. *Journal of Experimental Psychology*, *97*(3), 399. DOI: https://doi.org/10.1037/h0034165

Heilman, R. M. (2006). The impact of emotions and individual differences upon economic decision-making: a review of experimental literature. *Cognitie, Creier, Comportament/Cognition, Brain, Behavior*, *10*(3).

Huang, L., & Awh, E. (2018). Chunking in working memory via content-free labels. *Scientific reports*, *8*(1), 1-10. DOI: https://doi.org/10.1038/s41598-017-18157-5

Huff, M. J., & Umanath, S. (2018). Evaluating suggestibility to additive and contradictory misinformation following explicit error detection in younger and older adults. *Journal of experimental psychology: applied*, *24*(2), 180. DOI: https://doi.org/10.1037/xap000013

Jurchiș, R., Costea, A., Dienes, Z., Miclea, M., & Opre, A. (2018). Evaluative conditioning of artificial grammars: Evidence that non-conscious structures bias affective evaluations of novel stimuli. DOI: 10.31234/osf.io/jkfu5

Jurchiș, R., & Opre, A. (2016). Unconscious learning of cognitive structures with emotional components: Implications for cognitive behavior psychotherapies. *Cognitive Therapy and Research*, *40*(2), 230-244. DOI https://doi.org/10.1007/s10608-015-9743-z

Jurchiș, R., & Opre, A. (2018). A dual process approach to current issues from cognitive behavior therapies: An integrative perspective. *International Journal of Cognitive Therapy*, *11*(4), 374-409. DOI https://doi.org/10.1007/s41811-018-0023-z

Jurchiș, R. (2018). Fundamental properties of implicit knowledge structures: Implications for Cognitive Behavior Therapies. *Journal of Evidence-Based Psychotherapies*, *18*(2).

Kelley, C. M., & Jacoby, L. L. (2014). Memory attributions: Remembering, knowing, and feeling of knowing. In *Implicit memory and metacognition* (pp. 299-320). Psychology Press.

Lindauer, M. S. (1970). Unambiguity of forms and inequality of labels in studies of effect of language on memory for form. *Perceptual and Motor Skills, 30*(1), 175–181. DOI: https://doi.org/10.2466/pms.1970.30.1.175

Loftus, E. F. (1974). Reconstructiong memory: Incredible eyewitness. *Psychology today*, *1974*, 116-119.

Loftus, E. F. (1975). Leading questions and the eyewitness report. *Cognitive psychology*, *7*(4), 560-572. DOI: https://doi.org/10.1016/0010-0285(75)90023-7

Loftus, E. F., & Loftus, G. R. (1980). On the permanence of stored information in the human brain. *American Psychologist*, *35*(5), 409. DOI: https://doi.org/10.1037/0003-066X.35.5.409

Loftus, E. F., Miller, D. G., & Burns, H. J. (1978). Semantic integration of verbal information into a visual memory. *Journal of experimental psychology: Human learning and memory*, *4*(1), 19. DOI: https://doi.org/10.1037/0278-7393.4.1.19

Loftus, E. F. (1979). Reactions to blatantly contradictory information. *Memory & Cognition*, *7*(5), 368-374. DOI: https://doi.org/10.3758/BF03196941

Loftus, E. F., & Palmer, J. C. (1974). Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of verbal learning and verbal behavior*, *13*(5), 585-589. DOI: https://doi.org/10.1016/S0022-5371(74)80011-3

Loftus, E. F. (1991). Made in memory: Distortions in recollection after misleading information. In *Psychology of learning and motivation* (Vol. 27, pp. 187-215). Academic Press. DOI: https://doi.org/10.1016/S0079-7421(08)60124-3

Loftus, E. F. (1991). Memory distortions. *Canadian Psychology/Psychologie canadienne*, *32*(4), 645. DOI: https://doi.org/10.1037/h0084648

Loftus, E. F., & Palmer, J. C. (1996). *Eyewitness Testimony. Introducing Psychological Research, 305–309.* DOI: http://doi.org/10.1007/978-1-349-24483-6_46

Loftus, E. F., & Zanni, G. (1975). Eyewitness testimony: The influence of the wording of a question. *Bulletin of the Psychonomic Society*, *5*(1), 86-88. DOI: https://doi.org/10.3758/BF03336715.

McCloskey, M., & Zaragoza, M. (1985). Misleading postevent information and memory for events: Arguments and evidence against memory impairment hypotheses. *Journal of Experimental Psychology: General*, *114*(1), 1. DOI: https://doi.org/10.1037/0096-3445.114.1.1

Macmillan, N. A., & Creelman, C. D. (2004). *Detection theory: A user's guide*. Psychology press.

Nadel, L., & Moscovitch, M. (1997). Memory consolidation, retrograde amnesia and the hippocampal complex. *Current opinion in neurobiology*, *7*(2), 217-227. DOI: https://doi.org/10.1016/S0959-4388(97)80010-4

Nguyen, N. P., Yan, G., Thai, M. T., & Eidenbenz, S. (2012, June). Containment of misinformation spread in online social networks. In *Proceedings of the 4th Annual ACM Web Science Conference* (pp. 213-222). DOI: https://doi.org/10.1145/2380718.2380746

Nguyen, N. P., Yan, G., & Thai, M. T. (2013). Analysis of misinformation containment in online social networks. *Computer Networks*, *57*(10), 2133-2146. DOI: https://doi.org/10.1016/j.comnet.2013.04.002

Opre, A. (2012). *Inconstientul Cognitiv*. Polirom.

Opre, D., Pintea, S., Opre, A., & Bertea, M. (2018). Measuring Adolescents'subjective Well-Being in Educational Context: Development and Validation of a Multidimensional Instrument. *Journal of Evidence-Based Psychotherapies*, *18*(2), 161.

Pennycook, G., Epstein, Z., Mosleh, M., Arechar, A. A., Eckles, D., & Rand, D. G. (2021). Shifting attention to accuracy can reduce misinformation online. *Nature*, *592*(7855), 590-595.

Pickrell, J. E., McDonald, D., Bernstein, D. M., & Loftus, E. F. (2016). Misinformation effect. *Cognitive illusions: Intriguing phenomena in judgement, thinking and memory*, 406-423.

Pahre, R. (1999). *Leading questions: How hegemony affects the international political economy*. University of Michigan Press.

Reynolds, R. M. (2020). *Why Does Misinformation Persist? Cognitive Explanations of the Implicit Message Effect*. Michigan State University.

Roediger, H. L., & McDermott, K. B. (1995). Creating false memories: Remembering words not presented in lists. *Journal of experimental psychology: Learning, Memory, and Cognition*, *21*(4), 803.

Roediger, H. L. (2003). Reconsidering implicit memory. In J,S, Bowers, C,J, Marsolek, *Rethinking implicit memory*, 3-18. Oxford University Press.

Russo, R., Nichelli, P., Gibertoni, M., & Cornia, C. (1995). Developmental trends in implicit and explicit memory: A picture completion study. *Journal of Experimental Child Psychology*, *59*(3), 566-578.

Santa, J. L., & Ranken, H. B. (1972). Effects of verbal coding on recognition memory. *Journal of Experimental Psychology, 93*(2), 268–278. DOI: https://doi.org/10.1037/h0032514

Sievwright, O., Philipp, M., Drummond, A., Knapp, K., & Ross, K. (2021). Misinformation effects in an online sample: results of an experimental study with a five day retention interval. *PeerJ*, *9*, e12299.

Schacter, D. L. (2002). *The seven sins of memory: How the mind forgets and remembers*. HMH

Shao, C., Hui, P. M., Wang, L., Jiang, X., Flammini, A., Menczer, F., & Ciampaglia, G. L. (2018). Anatomy of an online misinformation network. *PloS one*, *13*(4), e0196087. DOI: https://doi.org/10.1371/journal.pone.0196087

Stoll, E. M. (2021). Misinformation modality and its effects on memory.

Swann, W. B., Giuliano, T., & Wegner, D. M. (1982). Where leading questions can lead: The power of conjecture in social interaction. *Journal of Personality and Social Psychology*, *42*(6), 1025. DOI: https://doi.org/10.1037/0022-3514.42.6.1025

Su, Y. (2021). It doesn't take a village to fall for misinformation: Social media use, discussion heterogeneity preference, worry of the virus, faith in scientists, and COVID-19-related misinformation beliefs. *Telematics and Informatics*, *58*, 101547.

Zaragoza, M. S., Belli, R. F., & Payment, K. E. (2007). Misinformation effects and the suggestibility of eyewitness memory. *Do justice and let the sky fall: Elizabeth Loftus and her contributions to science, law, and academic freedom*, 35-63.

Weinberg, H.I., Wadsworth, J. & Baron, R.S. (1983). Demand and the impact of leading questions on eyewitness testimony. *Memory & Cognition* **11,** 101–104. DOI: https://doi.org/10.3758/BF03197667

Wells, G. L., & Olson, E. A. (2003). Eyewitness testimony. *Annual Review of Psychology*, *54*(1), 277-295. DOI: 10.1146/annurev.psych.54.101601.145028

Windschitl, P. D. (1996). Memory for faces: Evidence of retrieval-based impairment. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *22*(5), 1101. DOI: https://doi.org/10.1037/0278-7393.22.5.1101

Visu-Petra, L., Cheie, L., & Benga, O. (2008). Short-term memory performance and metamemory judgments in preschool and early school-age children: A quantitative and qualitative analysis. *Cognitie, Creier, Comportament/Cognition, Brain, Behavior*, *12*(1)

Voinescu, A., & David, D. (2019). The effect of learning in a virtual environment on explicit and implicit memory by applying a process dissociation procedure. *International Journal of Human–Computer Interaction*, *35*(1), 27-37.

STUDIA UBB PSYCHOL.-PAED., LXVII, 2, 2022, p. 25-63
(Recommended Citation)
DOI:10.24193/subbpsyped.2022.2.02

THE INVESTIGATION OF MAJOR PREDICTORS OF WELL-BEING IN A SAMPLE OF ROMANIAN UNIVERSITY STUDENTS IN THE POST-COVID-19 PERIOD

Éva KÁLLAY[1]

ABSTRACT. The Coronavirus-induced pandemic has had a significant impact on the physical and psychological functioning of the entire world's population. Research has indicated that besides the physical threat to health itself, the implications of constant uncertainty, separation from and/or loss of loved ones, loss of freedom to travel, shortage of food and financial resources, disruptions of usual life-routines, changing work and learning habits, further aggravate the effect of initial stressors, leading to increased levels of depressive symptoms, anxiety, PTSD, insomnia, lowered levels of well-being, and confusion. Unfortunately, just as the two-years long pandemic ended, the Ukrainian war started, and the Romanian population, since our country borders Ukraine, has experienced a novel type of stress, that of the possibility of being attacked, affected economically. Almost simultaneously, the online education has returned to classical form of teaching, amidst semester, being another stress factor for students.

Our results indicated that the two-year long pandemic was considered as having the greatest impact by almost two-thirds of the students. Furthermore, the lack of self-efficacy component of perceived stress was a constant and strong predictor of all components of well-being (subjective and psychological), and perceived helplessness for subjective well-being. Regarding emotion regulation strategies refocus on planning, positive reevaluation, self- and other blame, withdrawal and actively approaching the source of stress proved to be the most important predictors.

The results of our investigation may be beneficial for the tailoring of future prevention and intervention programs that would target the enhancement of psychological adaptation of students.

Keywords: stress, depressive symptoms, uncertainty, emotion regulation strategies, subjective and psychological well-being, post COVID-19.

[1] Department of Psychology, Babes-Bolyai University, Cluj-Napoca, Romania, evakallay@gmail.com

Introduction

Since the mid-20th century, the world has been afflicted by an increasing number of natural (e.g., floods, earthquakes, wildfires, major storms), and environmental disasters (e.g., toxic pollutants, industrial accidents) (Colwel & Machlis, 2019). The implied physical threats, and psychological, economic, social implications, as well as the unpredictable nature of most of these disasters has significantly affected the entire populations' mental health and well-being (Bao, Sun, Meng, Shi, & Lu, 2020; Limcaoco, Mateos, Fernandez, & Roncero, 2020; Salari, Khazaie, Hosseinian-Far, Khaledi, & Eskandari, 2020). Additionally, research has also documented that the adults' life in the late, or liquid modernity (Bauman, 2007) is characterized by more and more complex sources of stress, as: increasing economic uncertainty, changes in basic value-systems (moral values, guidelines for what means a well-lived life), changes in work-style (advantages and disadvantages of telework, the psychological costs of temporary employments), frequent relocations, weakening of real social-bonds, pressure for excellence, constant competition, etc. (Banyard, Edwards, & Kendall-Tackett, 2009; Curran & Hill, 2017; Moscone, Tosetti, & Vittadini, 2016; Tavares, 2017; Twenge & Kasser, 2013; Verhaeghe, 2014; Virtanen, Kivimaki, Joensuu, Virtanen, Elovainio, & Vahtera, 2005). The effect of these changes is reflected by the dramatic increase of mental health problems world-wide (anxiety, depression, loneliness, etc.) (Erzen & Çikrikçi, 2018; WHO, 2017).

Temporally closest to us, worldwide, the last two and a half years have abounded in events that each, individually exceed common, usual human experiences. In March 2020, the World Health Organization declared the COVID-19 infection a worldwide pandemic, which became an increasingly serious public health problem (Phelan, Katz, & Gostin, 2020; Vergara-Buenaventura, Chavez-Tuñon, & Castro-Ruiz, 2020). Beside the rapid spread of the Sars-Cov-19, the high threat of physical contagion, the significant short- and long-term physical health-related sequelae (e.g., abnormal pulmonary functions, fatigue, severe cardiologic, neurologic and cognitive symptoms) (Zeng, Zhao, Yan, Li, Lu, Liu, et al., 2022), the population had to confront severe implications of the pandemics in collateral spheres of functioning as well: psychological, social, professional, economic, etc.

The psychological toll the entire population has had to pay has been significant both on short- and long-term, both for those who have recovered from the SARS-CoV infections themselves (Daher, Balfanz, Cornelissen, Müller, Bergs, Marx, et al., 2020; Hasan, Tabssum, Ambia, Zaman, Rahman, & Khan, et al., 2021), or have not been infected, but have had to experience the pandemic's

psychological, social, and economic implications (Arora, Grey, Östlundh, Lam, Omar, & Arnone, 2022; Bourmistrova, Solomon, Braude, Strawbridge, & Carter, 2022). Increased rates of stress, depression, anxiety, posttraumatic stress, insomnia, elevated levels of uncertainty, loneliness, confusion, lowered levels of well-being, etc. have been reported in studies conducted all over the world during the COVID-19 pandemic (e.g., Cespuglio, Strekalova, Spencer, Román, Reis, Bouteille, et al., 2021; Fernández-Abascal & Martín-Díaz, 2021; Vindegaard & Benros, 2020; Zhu, Sun, Zhang, Wang, Fan, Yang, et al., 2020). Additionally, the loss or severe illness of a loved one may be perceived as traumatic experiences and lead to significant posttraumatic dysfunctions (clinically significant or subclinical levels of depression, anxiety, PTSD, acute stress disorder, etc.) (Giannopoulou, Galinaki, Kollintza, Adamaki, Kympouropoulos, Alevyzakis, et al., 2021).

Additionally, after two years of stress and uncertainty due to the COVID-19 infections' possible individual and social implications, on the 24th of February 2022, Russia invaded the Ukraine, beginning the largest military conflict since the second World War (ABC News, 2022). The economic consequences of the Ukrainian war, the threat of the possible implication into the war of the neighboring countries (as Romania, for example), has further significantly increased the psychological discomfort and uncertainty.

1. Psychological uncertainty

A vast body of literature indicates that long states of uncertainty may become serious stressors themselves (Greco & Rogers, 2003; Lanzetta & Driscoll, 1966; Pervin, 1963; Rosen, Ivanova, & Knäuper, 2013; Zlomke & Jeter, 2014). Some persons are more capable to endure uncertainties, hope for the best outcome, and actively search for opportunities in a specific situation, while others present elevated levels of intolerance of uncertainty, by activating thoughts and emotions related to different highly maladaptive vulnerabilities (Carleton, Mulvogue, Thibodeau, McCabe, Antony, & Asmundson, 2012).

Several approaches consider that Intolerance of uncertainty (IU) is oriented towards possible future events (Dugas & Robichaud, 2007; Grenier, Barrette, & Ladouceur, 2005), and may very well be represented as a bi-dimensional construct:

(i) **the prospective IU** – the cognitive component of IU (e.g., "*Unforeseen events upset me greatly*", "*It frustrates me not having all the information I need*"), and

(ii) **the inhibitory IU** – the behavioral component of IU (e.g., "*Uncertainty keeps me from living a full life*", "*When it's time to act, uncertainty paralyses me*") (McEvoy & Mahoney, 2011).

High levels of Intolerance of Uncertainty have been found to be associated with different mental health problems, as anxiety, depression, obsessive-compulsive disorder, etc. as well as physical ailments (Keane & Barlow, 2002; Tolin, Abramowitz, Brigidi, & Foa, 2003). Furthermore, persons with high levels of IU may frequently experience mental discomfort as well, as impaired problem-solving abilities, inability to take decisions, reduced capacity to take action, leading to systematic avoidance of the situation (Dugas, Freeston, & Ladouceur, 1997).

The COVID-19 pandemic and the recent Ukrainian war created a global context where uncertainty-generating situations abound, exerting an additional burden especially on those persons who have already experienced high levels of intolerance of uncertainty.

The negative impact of the COVID-19 pandemic was investigated within a large spectrum of different populations (e.g., general population, children, older adults, medical staff), and different areas of functioning (intimacy in couples, economy, mass media, etc.) (e.g., Fegert & Schulze, 2020; Kaye, Okeagu, Pham, Silva, Hurley, Arron, et al., 2021; Meherali, Punjani, Louie-Poon, Abdul Rahim, Das, Salam, et al., 2021; Mercier, Arquizan, & Roubille, 2020; Shah, Mann, Singh, Bangar, & Kulkarni, 2020; Tang, Xiang, Cheung, & Xiang, 2021; Walton, Murray, & Christian, 2020, etc.). A very important area of investigation was the way in which the COVID-19 pandemic impacted the psychological functioning of university students, since this population is at an age of considerable vulnerability to mental health problems (Blanco, Okuda, Wright, Hasin, Grant, Liu, et al., 2008). This problem becomes extremely salient especially if we take into consideration the fact that these youngsters have to successfully make the transition from adolescence to adulthood, and university years may play a decisive role in this process (Arnett, 2014; Husky, Kovess-Masfety, & Swendsen, 2020).

The mental health of students during the COVID-19 pandemic

As previously presented, the COVID-19 pandemic has affected the population of the world not only on the physical level, but even more profoundly on the psychological, professional, educational, economic levels (Gvozden, Baucal, Krstic, & Filipović, 2021). In this situation, it is not surprising if the university student population, the "*essential community-building blocks*"

(Ebrahim, Dhahi, Husain, & Jahrami, 2022) would be affected in similar ways as the rest of the population, experiencing significant levels of stress, depression, uncertainty, to which each would try to adapt as well as possible. University students additionally had to face the challenges of online education (lack of constant, secure connection to the internet, lack of access to performant digital devices especially during examination periods, lack of knowledge to efficiently handle online-platforms, prepare for and take online-examinations, etc.), which may also increase their levels of perceived stress.

The mental health problems that resulted from maladaptive reactions to the COVID-19 related stress and uncertainty are strongly dependent on the nature of coping and emotion-regulation strategies used by the individual. Moreover, maladaptive reactions not only reflect in increases in significant emotional dysfunctioning, but also in serious declines in well-being (Garnefski & Kraaij, 2006; Kraaij & Granefski, 2019; Ryff & Singer, 2000, 2008).

2. Emotion regulation strategies

Literature indicates that confrontations with negative, highly intense life events, demand the use of specific strategies through which one may attempt to adapt to the threat and its consequences (Sloan, Hall, Moulding, Bryce, Mildred, & Staiger, 2017). Coping strategies usually refer to the person's reactions to the stressful event itself, while emotion regulation strategies address the regulation of the emotions that arise as a consequence of adverse encounters (Compas et al., 2017). Furthermore, literature also indicates that emotions may be regulated both cognitively and behaviorally (Kraaij & Granefski, 2019).

Emotion regulation strategies have been approached by different research traditions (e.g., Garnefski, Kraaij, & Spinhoven, 2001, 2002; Gross & Thompson, 2007). Garnefski and colleagues' (Garnefski, Boon, & Kraaij, 2003; Garnefski & Kraaij, 2006; Kraaij & Granefski, 2019) approach differentiates between ***conscious cognitive*** and ***behavioral emotion regulation strategies***, and have developed well-functioning instruments in order to measure both of these concepts (Conscious Cognitive Emotion Regulation Questionnaire – CERQ, and Behavioral Emotion Regulation Questionnaire - BERQ), instruments we will also use in our study.

2.1. Conscious Cognitive Emotion Regulation Strategies

Garnefski and Spinhoven (2001) define cognitive emotion regulation processes as "*the cognitive way of managing the intake of emotionally arousing information*" (p. 1313). Based on this definition, Garnefski, Kraaij, and Spinhoven's (2002) developed an instrument entitled *Cognitive Emotion Regulation Questionnaire* (**CERQ**). With the CERQ, the authors are able to map the strategies used most frequently by individuals after confronting negatively valenced events, as well as more stable regulatory styles in dealing with daily hassles. The CERQ may be used to assess the conscious cognitive emotion regulation strategies in a diversity of populations: healthy adolescents, adults, elderly people, as well as adolescent, adult and elderly psychiatric patients. One of the advantages implied in investigating cognitive emotion regulation strategies lies in their ability to be changed (learned and unlearned) either through own experiences or psycho-therapeutic intervention (e.g., CBT) (Garnefski, Kraaij, & Spinhoven, 2001).

The CERQ is a 36-item self-report instrument, measuring through nine different cognitive emotion-regulation strategies "*what people think after having experienced a negative or traumatic event*" (Garnefski, Kraaij, & Spinhoven, 2001, p. 7). The nine dimensions measured by the CERQ are as follow:

1. **Self-blame:** thoughts through which one blames oneself for confronting the event.

2. **Acceptance:** is the individual's ability to accept the implications of the confrontation, and become reconciled with the implications (Garnefski et al., 2001).

3. **Rumination**: recurrent thinking about the feelings and thoughts associated with the traumatic event.

4. **Positive refocusing**: also known as '*mental disengagement*' includes the individual's attempt to focus on other, positive events in order to not think of the actual event (Endler & Parker, 1990).

5. **Refocus on planning:** refers to the process through which the person thinks ahead to identify the steps necessary to handle the negative situation (Folkman & Lazarus, 1989).

6. **Positive reappraisal**: the individual's attempt to find the positive aspects of the event, thus attaining personal growth (Carver et al., 1989).

7. **Putting into perspective**: a form of social comparison, it is the process through which the individual minimizes the seriousness of the event by comparing it and its implications to other, apparently more important events (Allan & Gilbert, 1995).

8. **Catastrophizing**: is the process through which the person explicitly exaggerates the terror implied in the experience (Sullivan, Bishop, & Pivik, 1995), being strongly related to maladaptation, emotional distress and depression.

9. **Other-blame:** accusing others for the occurrence of the event is strongly associated with reduced levels of emotional well-being (Tennen & Affleck, 1990).

2.2. Behavior Emotion Regulation Strategies

As already stated, besides the well-investigated emotion-regulation strategies, individuals also use behavioral strategies through which they can manage the intense negative emotions that arise during and after encounters with adverse events. Previous research documented that specific behavioral patterns following stressful encounters (e.g., seeking social support, distracting one's attention from the event and its consequences) modulate the unfolding of emotional reactions (Joormann & Stanton, 2016; Kato, 2015). Kraaij and Garnefski (2019) have developed an instrument similar to the CERQ, but this time focusing on the presupposed effects behaviors exert on the relationship between stressful encounters and experienced adaptive/maladaptive reactions (*Behavioral Emotion Regulation Questionnaire* - **BERQ**), which consists of the following five subscales:

1. **Seeking distractions:** distracting attention from emotions related to the stressful situation by concentrating on doing something else;
2. **Withdrawal**: in order to deal with the stressful event, one withdraws from the event and social relationships (social isolation);
3. **Actively approaching the stressful event**: one directly and actively approaches the stressful event in order to cope with its' implications and one's own reactions;
4. **Seeking social support:** one explicitly and actively asks for support and actively shares emotions generated by the confrontation with the stressful event;
5. **Ignoring**: one copes with the stressful encounter by totally ignoring it and behaving as if it did not happen;

Based on previous research (Joormann & Stanton, 2016), Kraaij and Garnefski (2019) postulate that withdrawal and ignoring would lead to maladaptive, while seeking distraction, actively approaching and seeking social support adaptive reactions.

Cognitive and behavioral emotion regulation strategies were found to play an important role in the relationship between stressful encounters and hedonic/subjective and psychological well-being, across different cultures and populations (Megreya, Latzman, Al-Attiyah, & Alrashidi, 2016; Potthoff, Garnefski, Miklósi, Ubbiali, Dominguez-Sanchez, Martins, et al., 2016).

3. Well-being

The ***hedonic*** approach equates well-being with the human tendency to seek pleasure and happiness, simultaneously avoiding pain and suffering (Kahneman, Diener, & Schwartz, 1999). **Hedonic/subjective well-being** is well measured with instruments that target individual experiences of happiness, as the 5-item scale of subjective well-being proposed by the World Health Organization (Staehr Johansen, 1998; WHO Collaborating Centre in Mental Health, 1999).

On the other hand, according to the ***eudaimonic*** view, a well-lived life transcends mere happiness, and aspires towards the actualization of different human potentials that would, in the long-run, assist adaptive processes during adversities (Waterman, 1993).

Ryff and Singer's approach (e.g., 1998, 2000, 2008) differentiates between six types of eudaimonic/psychological well-being, as follows:

1. Self-acceptance. The non-judgmental acceptance of one's self together with one's past has been considered as one of the central aspects of mental health, self-actualization, optimal functioning, and maturity.

2. Positive relations with others. The ability to maintain warm, affectionate relationships with others has repeatedly been found to be both related to superior positive functioning, as well as a protective factor in adversity.

3. Autonomy. Individuals high in this ability tend to function independently of other's approval, to regulate emotions and behavior from within, establishing personal standards and evaluating oneself towards this standard.

4. Environmental mastery consists of the individual's capacity to create an 'outside world', an external environment that would enhance his/her functioning and adaptation, and "take advantage of environmental opportunities" (Ryff, 1989, p. 1071).

5. Purpose in life. Finding meaning in and for one's life has repeatedly been found to be associated with better mental functioning (Skrabski, Kopp, Rozsa, Rethelyi, & Rahe, 2005; Wong & Fry, 1998).

6. Personal growth. Those high on this dimensions of the eudaimonic well-being conceive themselves as being able of constant development, of improving and becoming increasingly more adapted (flourishers), while low scorers feel that they are stagnating, are not improving, developing more appropriate abilities (languishers) (Ryff, 2014).

The present study

The last couple of decades indicated an ascending pattern of students experiencing poor mental health all around the world (Avotney, 2014; Brown, 2018), i.e., high levels of depression, worry, anxiety, loneliness, substance misuse and abuse, self-harm, suicide ideations and attempts (Kruisselbrink Flatt, 2013; Pereira, Reay, Bottell, Walker, Dzikiti, Platt, et al., 2019; Pereira, Early, Outar, Dimitrova, Walker, & Dzikiti, 2020; Sivertson, Hysing, Knapstad, Harvey, Reneflot, Lønning, et al., 2019). In normal life conditions, emotional and mental well-being were found to be strongly associated with students' academic success and achievements (Esch, Bocquet, Pull, Couffignal, Lehnert, Graas, et al., 2014). Further on, well-being was found to affect motivation, active implication in learning, memory, attention, and concentration, social relationships, etc. (Unger, 2007). Thus, if mental health and well-being of university students are important factors to investigate in relatively *normal* life conditions, they have become even more salient in intense and long-lasting conditions of cumulative stress, as the two-year long COVID-19 pandemic and its' long-lasting implications (Cao, Fang, Hou, Han, Xu, Dong, & Zheng, 2020), topped by the recently started Ukrainian war, and changes in the way the educational process unfolded.

Briefly put, the last two and a half years have abounded in major life-stressors, the encounters of which may have elicited intense stress and high levels of uncertainty in the student population. Supposedly, students have addressed these reactions by using specific adaptive and maladaptive emotion regulation strategies (cognitive and behavioral), thus trying to accommodate to the demands of this complex situation. As literature indicated (as presented above), prolonged levels of distress might in time erode both subjective and psychological well-being, which further on might negatively impact their academic performance.

Objectives

Our study is a cross-sectional exploratory investigation, having the following major objectives:

(i) to identify which was considered, by the assessed student population, the most frequent major stressor (COVID-19 pandemics, Ukrainian war, changes in learning conditions, etc.) of the last two and a half years;

(ii) to identify the most significant predictors of both subjective and psychological well-being of the assessed student population.

Study

Participants

Using G*Power 3.1.9.4, in order to investigate our objectives, with α=0.05, 1-β=0.85 and an effect size of r=0.18, the minimum number of participants generated was N= 271 for a two-tail test. We conducted our research in the period between 10th of April and 20th of May 2022. Our sample was a convenience sample, participants being included on a voluntary basis, after consenting to anonymously participate in the study.

After cleaning for missing data, our study included 388 participants with complete data sets, with a mean age in of 27.18 years (SD=9.32), all students at the Babes-Bolyai University, Cluj-Napoca, Romania. 245 students were enrolled to the regular education (M_{age}=22.93, SD=6.58), and 143 to long-distance education (M_{age}=34.47, SD=8.80). 86.12% of the regular education group were female, and 13.88% male participants. Similar percentage of female-male participants represented the long-distance education group: 85.31% female and 14.69% male participants.

Instruments

The assessed **demographic variables** were: age, gender, form of education (regular and long-distance), residence (urban and rural), satisfaction with family income.

Using a semi-open question, we also assessed the event which affected our participants most (the COVID-19 pandemic, the Ukrainian war, the possibility that the war may have expanded into Romania as well, changing learning forms: from online to face-to-face, and other possible sources of stress = an open question, which they were asked to fill).

Depression tendencies were measured with the Beck Depression Inventory-II (BDI, Beck, Rush, Shaw & Emery, 1979; Romanian adaptation David & Dobrean, 2012). The BDI is a 21-item, multiple-choice format inventory, designed to measure the presence of depression in adults and adolescents. Each of the 21 items assesses a symptom or attitudes specific to depression, inquiring its somatic, cognitive and behavioral aspects. For the present sample, the internal consistency of the BDI was .90.

Stress was measured with the Perceived Stress Scale (PSS, Cohen, Kamarck, & Mermelstein, 1983; translated and adapted into Romanian by the authors in 2020). The PSS measures the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The PSS is a 10-item self-report questionnaire, composed of two major subscales: Perceived Helplessness (the belief that one cannot do anything significant to enhance the situation – sense of lack of control over the situation) and Lack of Self Efficacy (one's belief in his/her capacities to efficiently deal with the stressor and his/her own emotions) (Golden-Kreutz, Browne, Frierson, & Andersen, 2004; Roberti, Harrington, & Storch, 2006). Cronbach's alpha for the present sample was: Perceived Helplessness=.86, Lack of Self Efficacy=.80

Intolerance of Uncertainty was assessed with the 12-item version of the Intolerance of Uncertainty Scale (IUS-12, Carleton, Norton, & Asmundson, 2007; translated and adapted into Romanian by the authors in 2020). The IUS-12 permits the calculation of total scores, as well scores on the Prospective Anxiety and the Inhibitory Anxiety Subscale. Participants are asked to answer the 12 items on a five-point Likert-type scale (1=not at all characteristic of me; 5=entirely characteristic of me). For the present sample the internal consistency of the IUS-12 α=.91, and the two subscales was: Prospective Anxiety α=.86, and the Inhibitory Anxiety α=.85.

Psychological well-being was measured by the 44-item scale developed by Ryff (1989) and adapted by Kállay & Rus (2014) (translated and adapted into Romanian and Hungarian by the authors). This scale has 6 sub-scales measuring the basic components of eudaimonic well-being: self-acceptance (PWB-SA), positive relations with others (PWB-PRO), autonomy (PWB-A), environmental mastery (PWB-EM), purpose in life (PWB-PL), and personal growth (PWB-PG). The internal consistency of the Psychological Well-being scale for the present sample ranged from .74 to 89.

Subjective well-being was assessed with the 5-item WHO well-being questionnaire (Staehr Johansen, 1998; WHO Collaborating Centre in Mental Health, 1999), scale that focuses the assessment of positive affective states. Cronbach's alpha for the present sample was .90.

Emotion regulation strategies were measured with the Cognitive Emotion Regulation Questionnaire (CERQ) (Garnefski, Kraaij, & Spinhoven, 2002; Romanian adaptation, Perte & Tincas, 2010). The CERQ is a self-report questionnaire designed to measure cognitive coping strategies, assessing what people think after confronting specific negative events, or to assess the way people generally react after confronting negative events. The scale is comprised of nine sub scales: self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, other blame, each subscale containing four items. The internal consistency of the subscales for the present student population range from .74 to .88.

Behavioral emotion regulation strategies were measured with the 20-item Behavioral Emotion Regulation Questionnaire (BERQ, Kraaij & Granefski, 2019; translation by the authors on 2021). BERQ consists of five subscales, each of which has 4 items, and measures individual responses on a five-point Likert scale (from 1-almost never to 5=almost always). The internal consistency of BERQ's subscale are high, ranging from 0.86 to 0.93 (Kraaij & Garnefski, 2019). The internal consistency of the subscales for the present student population range from .77 to .87.

Results

Descriptive statistics

Data were analyzed with IBM SPSS Statistics 20. Firstly, we present the descriptive characteristics of our data (see Table 1).

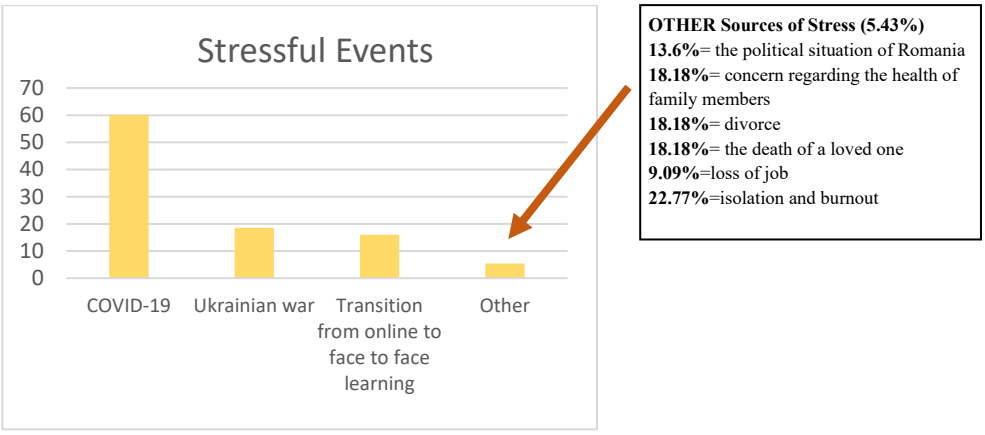
Table 1. Descriptive statistics

	N	**Min**	**Max**	**Mean**	**SD**	**Cr α**	**Kolmogorov-Smirnov**	
							Stat	Sig.
STRESS_TOT	388	.00	39	19.52	6.61	.86	.075	.000
STRESS_Perceived_Helplessness	388	.00	24	13.26	4.72	.86	.064	.001
STRESS_Lack_of_Self_Efficacy	388	.00	16	6.25	2.95	.80	.097	.000

	N	Min	Max	Mean	SD	Cr α	Kolmogorov-Smirnov	
							Stat	Sig.
BDI_TOT	388	.00	39	8.16	8.09	.90	.156	.000
UNCERTAINTY_TOT	388	12	60	32.39	10.00	.91	.069	.000
UNCERTAINTY_Prospective_Anxiety	388	7	35	19.63	5.977	.86	.080	.000
UNCERTAINTY_Inhibitory_Anxiety	388	5	25	12.75	4.65	.85	.103	.000
WHO_TOT	388	.00	100	57.05	20.17	.90	.084	.000
PWB_PRO	388	12	42	35.75	4.8	.74	.111	.000
PWB_EM	388	12	48	37.80	6.71	.87	.100	.000
PWB_PG	388	10	48	43.34	5.18	.86	.184	.000
PWB_PL	388	7	42	35.18	5.94	.88	.152	.000
PWB_SA	388	8	42	34.20	6.49	.89	.142	.000
PWB_AT	388	12	42	33.04	6.01	.83	.100	.000
CERQ_Self_Blame	388	4	20	10.56	3.44	.76	.089	.000
CERQ_Acceptance	388	4	20	13.63	3.47	.74	.091	.000
CERQ_Rumination	388	4	20	12.87	3.76	.81	.095	.000
CERQ_Positive_Refocus	388	4	20	11.35	3.98	.84	.091	.000
CERQ_Refocus_on_Planning	388	4	20	14.45	3.57	.81	.127	.000
CERQ_Positive_Reevaluation	388	4	20	14.95	3.94	.88	.169	.000
CERQ_Putting_into_Perspective	388	4	20	13.60	4.03	.84	.094	.000
CERQ_Catastrofization	388	4	20	8.43	3.53	.76	.107	.000
CERQ_Other_Blame	388	4	20	8.22	3.20	.81	.150	.000
BERQ_Seeking_Distraction	388	4	20	11.29	3.58	.77	.116	.000
BERQ_Withdrawal	388	4	20	9.06	3.84	.85	.174	.000
BERQ_Actively_Approaching	388	4	20	14.22	3.71	.87	.137	.000
BERQ_Seeking_Social_Support	388	4	20	12.55	4.27	.87	.068	.000
BERQ_Ignoring	388	4	20	7.94	3.47	.79	.135	.000

Note: *STRESS-TOT=Perceived Stress Total score, BDI – Beck Depression Inventory, WHO TOT= subjective well-being, PWB-AUT = Psychological Well-Being – Autonomy, PWB-EM =Psychological Well-Being – Environmental Mastery, PWB-PG = Psychological Well-Being – Personal Growth, PWB-PRO = Psychological Well-Being Positive Relations with Others, PWB-PL = Psychological Well-Being – Purpose in Life, PWB-SA = Psychological Well-Being – Self-Acceptance, CERQ = Conscious Cognitive Emotion Regulation Questionnaire), BERQ = Behavioral Emotion Regulation Questionnaire*

Next, we intended to investigate which stressful event was considered by most participants as being stressful. Our results indicate that 60.05% of the participants reported to have been most affected by the implications of the COVID-19 pandemics, 18.55% by the Ukrainian war (13.14% being affected by the possibility that the war would extend into Romania as well), 15.97% being affected by the relatively recent transition from online to face to face learning, and the rest of 5.43% of other by self-reported stressors (see Figure 1).



For our second objective, we conducted correlational analyses in order to identify association patterns between the assessed variables. The yielded results are presented in Tables 2, 3, and 4.

Table 2. Zero-order correlations between subjective well-being, mental health indicators (perceived stress, depressive symptoms, uncertainty) and emotion regulation strategies (conscious cognitive and behavioral)

	Subjective well-being (WHO)
Subjective well-being (WHO)	1
STRESS Perceived Helplessness	-.591**
STRESS Lack of Self-Efficacy	-.541**
BDI TOT	-.579**
UNCERTAINTY Prospective Anxiety	-.362**
UNCERTAINTY Inhibitory Anxiety	-.467**

	Subjective well-being (WHO)
CERQ Self Blame	-.249**
CERQ Acceptance	NS
CERQ Rumination	-.223**
CERQ Positive Refocus	.216**
CERQ Refocus on Planning	NS
CERQ Positive Reevaluation	.175**
CERQ Putting into Perspective	NS
CERQ Catastrofization	-.279**
CERQ Other Blame	-.139**
BERQ Seeking Distraction	NS
BERQ Withdrawal	-.392**
BERQ Actively Approaching	.146**
BERQ Seeking Social Support	NS
BERQ Ignoring	-.161**

Next, we conducted correlation analyses in order to investigate association patterns between the six components of psychological well-being and mental health indicators (perceived stress, depressive symptoms, and uncertainty). Results are presented in Table 3.

Table 3. Zero-order correlations between the six components of psychological well-being and mental health indicators (perceived stress, depressive symptomatology, and uncertainty)

	1	2	3	4	5	6	7	8	9	10	11
1.PWB_PRO	1										
2.PWB_EM	.61**	1									
3.PWB_PG	.61**	.66**	1								
4.PWB_PL	.56**	.82**	.71**	1							
5.PWB_SA	.60**	.81**	.72**	.80**	1						
6.PWB_AT	.46**	.70**	.62**	.63**	.71**	1					
7.STR_Perceived_Helpl	-.24**	-.44**	-.23**	-.33**	-.40**	-.37**	1				

	1	2	3	4	5	6	7	8	9	10	11
8.STR_Lack_of_Self_Eff	-.38**	-.58**	-.46**	-.50**	-.58**	-.52**	.45**	1			
9.BDI_TOT	-.34**	-.62**	-.43**	-.56**	-.59**	-.53**	.56**	.55**	1		
10.IU_Prospective_Anx	-.16**	-.30**	-.23**	-.23**	-.30**	-.31**	.53**	.33**	.42**	1	
11.IU_Inhibitory_Anx	-.23**	-.45**	-.33**	-.37**	-.44**	-.46**	.60**	.48**	.53**	.76**	1

Note: 1-PWB Positive Relations with Others; 2-PWB Environmental Mastery; 3-PWB Personal Growth; 4-PWB Purpose in Life; 5-PWB Self-Acceptance; 6-PWB Autonomy; 7-Stress Perceived Helplessness; 8-Stress Lack of Self Efficacy; 9-BDI TOT; 10-IU Prospective Anxiety; 11-IU Inhibitory Anxiety
***p<.01*

Our results indicate that all components of psychological well-being presented significant negative correlations with perceived helplessness, lack of self-efficacy, depressive symptoms, and the two components of intolerance of uncertainty.

In Table 4 we present correlations between the six components of psychological well-being and the subcomponents of conscious cognitive emotion regulation strategies (CERQ) and behavioral emotion regulation strategies (BERQ).

Table 4. Zero-order correlations between the six components of psychological well-being and mental health indicators (perceived stress, depressive symptomatology, and uncertainty)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.	1																			
2.	.61**	1																		
3.	.61**	.66**	1																	
4.	.56**	.82**	.71**	1																
5.	.60**	.81**	.72**	.80**	1															
6.	.46**	.70**	.62**	.63**	.71**	1														
7.	NS	-.27**	-.11*	-.28**	-.28**	-.24**	1													
8.	.17**	NS	.22**	NS	.12*	NS	.40**	1												
9.	.NS	-.12*	NS	NS	NS	-.11*	.49**	.58**	1											
10.	.22**	.31**	.28**	.32**	.33**	.27**	NS	.33**	.13**	1										
11.	.33**	.29**	.42**	.31**	.32**	.27**	.28**	.56**	.49**	.49**	1									

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12.	.35**	.40**	.48**	.44**	.49**	.38**	.11*	.55**	.34**	.57**	.79**	1								
13.	.23**	.25**	.30**	.29**	.36**	.20**	.12*	.47**	.25**	.51**	.56**	.67**	1							
14.	-.14**	-.26**	-.25**	-.26**	-.33**	-.28**	.41**	.11*	.28**	NS	NS	-.17	.01	1						
15.	-.20**	-.15**	-.19**	-.16**	-.18**	-.15**	.22**	.11*	.18**	.14**	NS	NS	NS	.51	1					
16.	.11*	NS	.14**	NS	.10*	.11*	.12*	.30**	.18**	.43**	.31**	.32**	.32**	.15**	.17**	1				
17.	-.32**	-.38**	-.27**	-.37**	-.38**	-.35**	.31**	.16**	.30**	NS	NS	-.14**	NS	.39	.26	.26	1			
18.	.29**	.33**	.40**	.32**	.35**	.31**	.14**	.40**	.31**	.33**	.66**	.61**	.37**	-.12*	NS	.40**	NS	1		
19.	.16**	NS	.10*	NS	NS	NS	.21**	.30**	.37**	.14**	.39**	.29**	.19**	.12*	.13**	.23**	NS	.43**	1	
20.	-.14**	-.13**	-.13**	-.15**	-.13**	-.15**	.14**	.10*	NS	.15**	NS	NS	.14**	.31**	.34**	.55**	.46**	NS	NS	1

Note: 1-PWB Positive Relations with Others; 2-PWB Environmental Mastery; 3-PWB Personal Growth; 4-PWB Purpose in Life; 5-PWB Self-Acceptance; 6-PWB Autonomy; 7-CERQ Self Blame; 8-CERQ Acceptance; 9-CERQ Rumination; 10-CERQ Positive Refocus; 11-CERQ Refocus on Planning; 12-CERQ Positive Reevaluation; 13-CERQ Putting into Perspective; 14-CERQ Catastrofization; 15-CERQ Other Blame; 16-BERQ Seeking Distraction; 17-BERQ Withdrawal; 18-BERQ Actively Approaching; 19-BERQ Seeking Social Support; 20-BERQ Ignoring
**p<.05; **p<.01*

As results presented in Table 4 indicate that all the six components of psychological well-being present significant positive correlations with: acceptance, positive refocus, refocus on planning, putting into perspective, seeking distraction, actively approaching the source of stress, seeking social support, and significant negative association patterns with: self-blame, catastrofization, other blame, withdrawal, and ignoring.

Next, we proceeded to investigate the best predictors of subjective and psychological well-being. Thus, we conducted seven hierarchical multiple regression (HMR) analyses in order to investigate the degree to which subjective/hedonic well-being (as measured with the WHO 5-item scale) (Table 5) and the six components of psychological well-being (as measured with PWB scale) (Table 6-11) are predicted by the variables that correlated with them.

The results of all HMRs models presented below follow the same procedure:

(i) variables (predictors) were entered stepwise in the model based on the correlation matrix for the variable to be predicted (the dependent variable);

(ii) preliminary analyses would be conducted to ensure no violation of the assumptions of normality, collinearity, and homoscedasticity.

(iii) after running and rerunning the regression analyses, we would select in the final model those variables which significantly predict each dependent variable.

Thus, for **subjective well-being**, in the first step of the HMR we entered demographic variables. In step two we introduced the two components of perceived stress (perceived helplessness and lack of self-efficacy). In the third step, we introduced depressive symptomatology, in the fourth step we introduced the two components of intolerance of uncertainty (prospective and inhibitory anxiety), in the fifth step we introduced those conscious emotion regulation strategies that were significantly associated with subjective well-being (self-blame, rumination, positive refocus, catastrofization), and in the final step, the withdrawal and ignorance components of behavioral emotion regulation that correlated significantly with subjective well-being. The results of the final HR model for subjective well-being are presented in Table 5.

Table 5. Hierarchical Regression Model with satisfaction with family income, perceived helplessness, lack of self-efficacy, and depressive symptoms as predictors of subjective well-being for the assessed student population

	R	**R^2**	**R^2 Change**	**B**	**SE**	**ß**	**t**
Step 1	.25	.065***	.065				
Satisfaction with family income				7.57	1.42	.25	5.18(***)
Step 2	.67	.45***	.39				
Satisfaction with family income				3.42	1.14	.11	2.98 (**)
Perceived helplessness				-1.77	.18	-.41	-9.72(***)
Lack of self-efficacy				-2.27	.29	-.33	-7.82(***)
Step 3	.69	.48***	.031				
Satisfaction with family income				2.55	1.13	.08	2.25(*)
Perceived helplessness				-1.40	.19	-.32	-7.22(***)
Lack of self-efficacy				-1.69	.30	-.24	-5.51(***)
Depression symptoms				-.58	.12	-23	-4.80(***)

Model one with satisfaction with family income as predictor of subjective well-being proved to be statistically significant [$F_{(1,386)}$=26.86, *p<.001*], predicting 6.5% of the variance in subjective well-being. Next we introduced the two components of the perceives stress (perceived helplessness and lack of self-efficacy) which also proved statistically significant [$F_{(3,384)}$=106.89, *p<.001*], explaining an additional 39% of the variance in subjective well-being (of which helplessness explaining an additional 30.3% and lack of self-efficacy an additional 8.7%). In the third, final step we introduced depressive symptoms. This final model was also statistically significant [$F_{(4,383)}$=90.5, *p<.001*], explaining an additional 3.1% of the variance in subjective well-being. The three variables together (satisfaction with family income, perceived stress and depressive symptoms) explain a total of 48% of the variance in subjective well-being.

We continued our investigation with conducting hierarchical multiple regression analyses for the six components of psychological well-being. Based on the correlation matrix for psychological well-being (see Tables 3 and 4), in the first step of the HMR we entered demographic variables. In step two we introduced the two components of perceived stress (perceived helplessness and lack of self-efficacy). In the third step, we introduced depressive symptomatology, and in the fourth step we introduced the two components of intolerance of uncertainty (prospective and inhibitory anxiety), in the fifth step we introduced those conscious emotion regulation strategies that were significantly associated with the specific component of psychological well-being), and in the final step, the components of behavioral emotion regulation that presented significant correlations with the variable to be predicted. The results of the final HR models for the six components of psychological well-being are presented in Tables 6 to 11.

Regarding **positive relations with others,** based on the correlation matrix, in the first step of the HMR we entered demographic variables. In step two we introduced he two components of perceived stress (perceived helplessness and lack of self-efficacy), next depressive symptomatology, in the fourth step we introduced the two components of intolerance of uncertainty, in the fifth step we introduced those conscious emotion regulation strategies that were significantly associated with positive relations with, and in the final step, the components of behavioral emotion regulation that correlated significantly with positive relations with others. The results of the final HR model for positive relations with others are presented in Table 6.

Table 6. Hierarchical Regression Model of psychological well-being **positive relations with others**, with gender, satisfaction with family income, lack of self-efficacy, CERQ Refocus on planning, and withdrawal as predictors for the assessed student population

	R	R^2	R^2 Change	B	SE	ß	t
Step 1	**.32**	**.10*** **	**.108**				
Gender				-2.23	.66	-.16	-3.32(**)
Satisfaction with family income				1.92	.34	.27	5.59(**)
Step 2	**.49**	**.24*** **	**.134**				
Gender				-2.86	.62	-.20	-4.61(***)
Satisfaction with family income				1.45	.32	.20	.4.51(***)
Lack of self-efficacy				-.61	.07	-.37	-8.25(***)
Step 3	**.52**	**.27*** **	**.036**				
Gender				-2.80	.60	-.20	-4.65(***)
Satisfaction with family income				1.09	.32	.15	3.42(**)
Lack of self-efficacy				-.37	.08	-.22	-4.26(***)
CERQ Refocus on planning				.27	.06	.20	4.47(***)
Step 4	**.56**	**.32*** **	**.042**				
Gender				-2.74	.59	-.19	-4.63(***)
Satisfaction with family income				1.05	.31	.14	3.34(**)
Lack of self-efficacy				-.34	.08	-.21	-4.00(***)
CERQ Refocus on planning				-.29	.06	.21	4.81(***)
Withdrawal				-.24	.06	-.19	-3.99(***)

Model one with gender and satisfaction with family income as predictor of positive relations with others proved to be statistically significant [$F_{(2,385)}$=23.40, *p<.001*], explaining 10.8% of the variance in positive relations with others. Next we introduced the lack of self-efficacy component of the perceived stress which also proved statistically significant [$F_{(3,384)}$=41.04, *p<.001*], explaining an additional 13.3% of the variance in positive relations with others. In the third step we introduced the refocus on planning component of the conscious cognitive emotion regulation strategies; this model also proved to be statistically significant, [$F_{(4,383)}$=36.92, *p<.001*], explaining an additional 3.4% of the variance in the positive relations with others component of psychological well-being. In the

final model, we introduced the withdrawal component of the behavioral emotion regulation strategy. This model also proved statistically significant [$F_{(5,382)}$=36.07, *p<.001*], explaining an additional 4.1 % of the variance. The five variables together (gender, satisfaction with family income, lack of self-efficacy, refocus on planning, and withdrawal) explain a total of 31.2% of the variance in the positive relations with others component of psychological well-being.

We continued with **the environmental mastery** of psychological well-being**,** where, based on the correlation matrix, in the first step of the HMR we entered demographic variables. In step two we introduced the two components of perceived stress (perceived helplessness and lack of self-efficacy). In the third step, we introduced depressive symptomatology, and in the fourth step we introduced the two components of intolerance of uncertainty), in the fifth step we introduced those conscious emotion regulation strategies that were significantly associated with environmental mastery, and in the final step, those components of behavioral emotion regulation that correlated significantly with environmental mastery. The results of the final HR model for global scores of environmental mastery are presented in Table 7.

Table 7. Hierarchical Regression Model of psychological well-being **environmental mastery** with gender, satisfaction with family income, lack of self-efficacy, depressive symptoms, seeking distraction, and actively approaching the source of stress, as predictors for the assessed student population

	R	R^2	R^2 Change	B	SE	ß	t
Step 1	**.32**	**.10*****	**.106**				
Gender				-1.17	.93	-.06	-1.26 (NS)
Satisfaction with family income				3.09	.47	.31	6.45(**)
Step 2	**64**	**.41*****	**.30**				
Gender				-2.52	.76	-.13	-3.30(**)
Satisfaction with family income				2.10	.39	.21	5.32(***)
Lack of self-efficacy				-1.28	.09	-.56	-14.06(***)
Step 3	**.71**	**.51*****	**.108**				
Gender				-2.94	.69	-.15	-4.25(***)
Satisfaction with family income				1.38	.36	.14	3.77(**)
Lack of self-efficacy				-.81	.09	-.35	-8.35(***)
BDI				-.33	.03	-.40	-9.24(***)

	R	R^2	R^2 Change	B	SE	ß	t
Step 4	**.72**	**.53*** **	**.015**				
Gender				-3.00	.68	-.15	-4.38(***)
Satisfaction with family income				1.31	.36	.13	3.57(***)
Lack of self-efficacy				-.72	.10	-.31	-6.97(***)
BDI				-.32	.03	.39	-9.05(***)
BERQ-Seeking distraction				-.14	.07	-.07	-1.92(*)
BERQ-Actively approaching the source of stress				.25	.07	.14	3.36(**)

Model one with gender and satisfaction with family income as predictor of environmental mastery proved to be statistically significant [$F_{(2,385)}$=22.72, *p<.001*], explaining 10.6%% of the variance in environmental mastery. Next we introduced the lack of self-efficacy component of the perceived stress which also proved statistically significant [$F_{(3,384)}$=88.86, *p<.001*], explaining an additional 30.4% of the variance in environmental mastery. In the third step we introduced depressive symptoms, model that also proved to be statistically significant, [$F_{(4,383)}$=102.70, *p<.001*], explaining an additional 10.8% of the variance in environmental mastery. In the final model, we introduced the distraction seeking and active approach of the source of stress components of the behavioral emotion regulation strategy. This model also proved statistically significant [$F_{(65,381)}$=72.23, *p<.001*], explaining an additional 1.4% of the variance. The six variables together (gender, satisfaction with family income, lack of self-efficacy, depressive symptoms, seeking distraction and actively approaching the source of stress) explain a total of 53.2% of the variance in environmental mastery.

What concerns the **personal growth** component of psychological well-being**,** based on the correlation matrix, in the first step of the HMR we entered demographic variables. In step two we introduced he two components of perceived stress. In step three, we introduced depressive symptomatology, in the fourth step we introduced the two components of intolerance of uncertainty in the fifth step we introduced those conscious emotion regulation strategies that were significantly associated with personal growth, and in the final step those components of behavioral emotion regulation that correlated significantly with personal growth. The results of the final HR model for personal growth are presented in Table 8.

Table 8. Hierarchical Regression Model of psychological well-being **personal growth** with gender, lack of self-efficacy, depressive symptoms, positive reevaluation, other blame, and actively approaching the source of stress as predictors for the assessed student population

	R	R^2	R^2 Change	B	SE	ß	t
Step 1	**.13**	**.01****	**.017**				
Gender				-1.19	.74	-.31	-2.59 (**)
Step 2	**.49**	**.24*****	**.229**				
Gender				-2.69	.66	-.18	-4.08(**)
Lack of self-efficacy				-.84	.07	-.48	-10.83(***)
Step 3	**.54**	**.29*****	**.047**				
Gender				-2.82	.64	-.19	-4.41(***)
Lack of self-efficacy				-.59	.09	-.34	-6.59(***)
BDI				-.16	.03	-.26	-5.05(***)
Step 4	**.62**	**.39*****	**.096**				
Gender				-2.28	.60	-.15	-3.80(***)
Lack of self-efficacy				-.37	.08	-.21	-4.15(***)
BDI				-.13	-.20	-.20	-4.30(***)
CERQ-Positive reevaluation				.42	.32	.32	7.34(***)
CERQ-Other blame				-.20	-.12	-.12	-3.08(**)
Step 5	**.63**	**.39****	**.012**				
Gender				-2.39	.59	-.16	-4.01(***)
Lack of self-efficacy				-.31	.09	-.17	-3.42(***)
BDI				-.14	.03	-.22	-4.60(***)
CERQ-Positive reevaluation				.32	.06	.24	4.75(***)
CERQ-Other blame				-.20	.06	-.12	-3.13(**)
BERQ-Actively approaching the source of stress				.19	.07	.14	2.75(***)

Model one with gender as predictor of personal growth proved to be statistically significant [$F_{(1,386)}$=6.73, *p<.01*], explaining 1.7% of the variance. Next we introduced the lack of self-efficacy component of the perceived stress which also proved statistically significant [$F_{(2,385)}$=63.02, *p<.001*], explaining an additional 23% of the variance in personal growth. In the third step we introduced depressive symptoms, model that also proved to be statistically significant, [$F_{(3,384)}$=53.22, *p<.001*], explaining an additional 4.7% of the variance in

environmental mastery. In the fourth step we introduced other blame and positive reevaluation components of conscious cognitive motion regulation strategies. This model also proved statistically significant [$F_{(5,382)}$=48.85, *p<.001*], explaining an additional 9.6 % of the variance. In the final model, we introduced the active approach of the source of stress component of the behavioral emotion regulation strategy. This model also proved statistically significant [$F_{(6,381)}$=42.67, *p<.001*], explaining an additional 1.2% of the variance. The six variables together explain a total of 40.2% of the variance in personal growth.

For **purpose in life,** in the first step of the HMR we entered demographic variables. In step two we introduced the two components of perceived stress, in step three depressive symptomatology, in the fourth step we introduced the two components of intolerance of uncertainty, in the fifth step we introduced those conscious emotion regulation strategies that were significantly associated with purpose in life, and in the final step those components of behavioral emotion regulation that correlated significantly with purpose in life. The results of the final HR model for purpose in life are presented in Table 9.

Table 9. Hierarchical Regression Model of psychological well-being **purpose in life** with gender, lack of self-efficacy, depressive symptoms, other-blame, and positive reevaluation as predictors for the assessed student population

	R	R^2	R^2 Change	B	SE	ß	t
Step 1	**.11**	**.01***	**.013**				
Gender				-1.93	.86	-.11	-2.27 (*)
Step 2	**.53**	**.28*****	**.267**				
Gender				-2.88	.73	-.17	-3.90(***)
Lack of self-efficacy				-1.04	.08	-.52	-11.95(***)
Step 3	**.63**	**.40*****	**.126**				
Gender				-3.12	.67	-.18	-4.64(***)
Lack of self-efficacy				-.57	.09	-.28	-6.08(***)
BDI				-.31	.03	-.42	-9.02(***)
Step 4	**.68**	**.46*****	**.061**				
Gender				-2.55	.64	-.15	-3.96(***)
Lack of self-efficacy				-.38	.09	-.18	-3.98(***)
BDI				-.24	.03	-.33	-6.99(***)
CERQ- Self blame				-.25	.07	-.14	-3.48(***)
CERQ- Positive reevaluation				.41	.06	.27	6.38(**)

Model one with gender as predictor of purpose in life proved to be statistically significant [$F_{(1,386)}$=5.15, *p<.01*], explaining 1.3% of the variance. Next we introduced the lack of self-efficacy component of the perceived stress which also proved statistically significant [$F_{(2,385)}$=75.04, *p<.001*], explaining an additional 26.7% of the variance in purpose in life. In the third step we introduced depressive symptoms, model that also proved to be statistically significant, [$F_{(3,384)}$=87.64, *p<.001*], explaining an additional 12.6% of the variance in purpose in life. Finally, we introduced self-blame and positive reevaluation components of conscious cognitive motion regulation strategies. This model also proved statistically significant [$F_{(5,382)}$=67.14, *p<.001*], explaining an additional 6.2 % of the variance. The five variables together explain a total of 46.8% of the variance in purpose on life.

For **self-acceptance,** in the first step of the HMR we entered demographic variables. In step two we introduced he two components of perceived stress, step three we introduced depressive symptomatology, in step four the two components of intolerance of uncertainty, in step five those conscious emotion regulation strategies that were significantly associated with self-acceptance, and in the final step those components of behavioral emotion regulation that correlated significantly with self-acceptance. The results of the final HR model for self-acceptance are presented in Table 10.

Table 10. Hierarchical Regression Model of psychological well-being **self-acceptance** with lack of self-efficacy, depressive symptoms, putting into perspective, self-blame, positive reevaluation, and withdrawal as predictors for the assessed student population

	R	R^2	R^2 Change	B	SE	ß	t
Step 1	**.58**	**.33*** **	**.33**				
Lack of self-efficacy				-1.28	.09	-.58	-14.05(***)
Step 2	**.66**	**.44*** **	**.10**				
Lack of self-efficacy				-.80	.10	-.36	-8.03(***)
BDI				-.31	.03	-.39	-8.69(***)
Step 3	**.73**	**.53*** **	**.08**				
Lack of self-efficacy				-.57	.09	-.26	-5.88(***)
BDI				-.24	.03	-.29	-6.62(***)
CERQ Putting into perspective				-.31	.07	-.16	-4.23(***)
CERQ self-blame				.39	.08	.24	4.70(***)
CERQ positive reevaluation				.17	.07	.10	2.31(*)

	R	R^2	R^2 Change	B	SE	ß	t
Step 4	**.73**	**.54*** **	**.006**				
Lack of self-efficacy				-.56	.09	-.25	-5.79(***)
BDI				-.21	.03	-.126	-5.53(***)
CERQ Putting into perspective				-.28	.07	-.25	-3.88(***)
CERQ self-blame				.37	.08	.23	-4.45(***)
CERQ positive reevaluation				.20	.07	.12	2.62(**)
BERQ Withdrawal				-.14	.06	-.08	-2.14(*)

Model one with lack of self-efficacy proved statistically significant [$F_{(1,386)}$=197.55, *p<.001*], explaining 33.9% of the variance in self-acceptance. In the second step we introduced depressive symptoms, model that also proved to be statistically significant, [$F_{(2,385)}$=155.68, *p<.001*], explaining an additional 10.8% of the variance in self-acceptance. In the third model, with the following conscious cognitive emotion regulation strategies: putting into perspective, self-blame, and positive reevaluation also proved statistically significant [$F_{(5,382)}$=88.12, *p<.001*], explaining an additional 8.9 % of the variance. In the final model we introduced the withdrawal component of the behavioral emotion regulation strategies. This model also proved statistically significant [$F_{(6,381)}$=74.89, *p<.001*], explaining an additional 0.5 % of the variance These six variables together explain a total of 54.1% of the variance in self-acceptance.

Finally, for **autonomy,** in the first step of the HMR we entered demographic variables. In step two we introduced he two components of perceived stress, in the third step depressive symptomatology, in step four the two components of intolerance of uncertainty, in the fifth step those conscious emotion regulation strategies that were significantly associated with autonomy, and in the final step those components of behavioral emotion regulation that correlated significantly with autonomy. The results of the final HR model for autonomy are presented in Table 11.

Table 11. Hierarchical Regression Model of psychological well-being **autonomy** with lack of self-efficacy, depressive symptoms, positive reevaluation, withdrawal, and seeking social support as predictors for the assessed student population

	R	R^2	R^2 Change	B	SE	ß	t
Step 1	**.52**	**.28*** **	**.280**				
Lack of self-efficacy				-1.07	.08	-.52	-12.24 (***)
Step 2	**.60**	**.36*** **	**.085**				
Lack of self-efficacy				-.68	.09	-.33	-6.91(***)
BDI				-.26	.03	-.35	-7.19(***)

	R	R^2	R^2 Change	B	SE	ß	t
Step 3	**.62**	**.38*** **	**.023**				
Lack of self-efficacy				-.56	.10	-.27	-5.46(***)
BDI				-.24	.03	-.33	-6.95(***)
CERQ positive reevaluation				.25	.06	.16	3.82(***)
Step 4	**.63**	**.40*** **	**.021**				
Lack of self-efficacy				-.56	.10	-.27	-5.51(***)
BDI				-.19	.03	-.25	-4.85(***)
CERQ positive reevaluation				.32	.07	.21	4.62(***)
BERQ Withdrawal							
BERQ Seeking Social Support				-.17	.07	-.11	-2.43(**)
				-.17	.05	-.12	-2.91(**)

Model one with lack of self-efficacy component of the perceived stress proved statistically significant [$F_{(1,386)}$=149.83, *p<.001*], explaining 28% of the variance in autonomy. In the second step we introduced depressive symptoms, model that also proved to be statistically significant, [$F_{(2,385)}$=110.67, *p<.001*], explaining an additional 8.5% of the variance in autonomy. In the third model we introduced the positive reevaluation component of conscious cognitive motion regulation strategies. This model also proved statistically significant [$F_{(3,384)}$=81.25, *p<.001*], explaining an additional 2.3% of the variance. In the final model we introduced the withdrawal component of the behavioral emotion regulation strategies. This model also proved statistically significant [$F_{(5,382)}$=52.85, *p<.001*], explaining an additional 2.1% of the variance. These five variables together explain a total of 40.9% of the variance in autonomy.

Discussions

Recently, the research community turned its attention towards the investigation of the factors and subjacent mechanisms that sustain and promote mental health in students (Brown, 2018; Flatt, 2013). This interest was kindled by the increasing number of students experiencing poor mental health all around the world (Avotney, 2014; Brown, 2018): high levels of depression, worry, anxiety, loneliness, substance misuse and abuse, self-harm, suicide ideations and attempts (Drum, Brownson, Denmark, & Smith, 2009; Kruisselbrink Flatt, 2013; Pereira, et al., 2019; Pereira, et al., 2020; Sivertson,

Hysing, Knapstad, Harvey, Reneflot, Lønning, et al., 2019; Storrie, Ahern, & Tuckett, 2010). Most mental health problems begin early in life, and many of them start to manifest between 18 and 24 years of age (which coincides with average student enrollment) (Kessler, Amminger, Aguilar-Gaxiola, Alonso, Lee, and Ustün, 2007), and are highly predictive for psychological dysfunctions in adulthood (Otto, Reiss, Voss, Wüstner, Meyrose, Hölling, et al., 2021). Thus, the investigation of mental health in college years becomes crucial, and has seriously increased scientific, public and health-policy concerns (Auerbach, Mortier, Bruffaerts, Alonso, Benjet, Cuijpers, et al., 2018; Barden & Caleb, 2019; Brown, 2018; Dogan, 2018). In normal life conditions, emotional and mental well-being were found to be strongly associated with students' academic success and achievements (Esch, et al., 2014; Lipson & Eisenberg, 2017). More specifically, well-being was found to affect motivation, active implication in learning, memory, attention, and concentration, social relationships, etc. (Unger, 2007). Research also indicates that due to developmental characteristics, adolescents and young adults may be seriously affected not only by the inherent life-threatening aspects of different highly-stressful situations, but also by the resulting social restrictions as well (Fegert & Schulze, 2020).

Thus, if mental health and well-being of university students are important factors to investigate in relatively normal life conditions, they have become even more salient in intense and long-lasting conditions of cumulative stress and uncertainty, as the two-year long COVID-19 pandemic (Cao, Fang, Hou, Han, Xu, Dong, & Zheng, 2020), topped by the recently started Ukrainian war, and their long-lasting implications.

Our cross-sectional exploratory investigation had two major objectives: to identify which was considered, by the assessed student population, the most frequent major stressor (COVID-19 pandemics, Ukrainian war, changes in learning conditions, etc.) of the last two and a half years, and to identify the most significant predictors of both subjective and psychological well-being of the assessed student population.

Our results indicate that despite at the moment of our investigation the COVID-19 pandemic has officially ended, its massive psychological reverberations have persisted in over 60% of the students. The Ukrainian war, the possibility that it may extend in our country (which is neighboring Ukraine), and the changes that accompanied the return to face-to-face education, were experienced as having the greatest impact by almost 35% of the students. The remaining 5% reported to be impacted most by other sources of stress, as illness/loss of loved ones, divorce, the political situation of the country. These results may be

interpreted through the major impact the long-term, multifaceted threats and uncertainties characterizing the COVID-19 pandemic. These results are in consensus with the vast number of studies, presented in the introductory part of this study. Interestingly however, our results indicated no significant differences in any of the assessed mental health indicators (depressive symptoms, intolerance of uncertainty, perceived Stress, subjective and psychological well-being).

Further, we proposed to investigate the variables that predict best the two major forms of well-being (subjective and psychological), which according to the above-mentioned literature are strongly related to the academic performance of university students. Consequently, we conducted seven hierarchical multiple regression (HMR) analyses that indicated as follows: **subjective well-being,** the construct of well-being that is mostly associated with satisfaction, the experience of happiness, positive emotions, and infrequent experience of negative affective states, was found to be best predicted by the perceived stress, especially by perceived helplessness (the sense that one cannot actively and efficiently control the source or reactions to a stressor), and of lack of self-efficacy (the belief that one does no possess the abilities necessary to regulate one's own reactions to the source of stress). Furthermore, contentment with the financial situation of the family seems to matter for our sample in this complex situation, since it is the only demographic variable that significantly contributes to the experiencing of positive emotions. Briefly put intense, maladaptive levels of stress involving lack of control over the situation and lack of self-efficacy reduce the perceived levels of subjective well-being, which may be further impacted by the shortage of financial resources that in times of distress are an important means through which one may procure instrumental support. These results are in line with previous research that indicates the major role perceived stress on subjective well-being (Atanes, Andreoni, Hirayama, Montero-Marin, Barros, Ronzani, et al., 2015).

Regarding the six components of **psychological well-being**, our results indicate that one of the common best predictors is the lack of self-efficacy component of perceived stress (in the case of positive relations with others, environmental mastery, personal growth, in purpose in life, self-acceptance, and autonomy. We may conclude that the stronger one's ability to actively control and regulate one's own reactions to the source of stress, and one's belief in his/her capacities to efficiently deal with the stressor and his/her own emotions is a very important factor in the components of well-being that transcend the mere experience of positive affective states in the complex situations created after the debut of the COVID-19 pandemic. Moreover, various emotion regulation strategies

also significantly contributed to the variance in these six components of psychological well-being. For instance, refocus on planning proved to significantly predict positive relations with others, a component that was found to be related to flourishing, and being a powerful protective factor during adversity (Ryff & Keyes, 1995). Positive reevaluation and other blame proved to be significant predictors of personal growth, which is one of the core components of psychological well-being, through which the person perceives life as a continuous process of change and adaptation to challenges, as opportunities through which one may enhance, and less as a fixed, stable situation. Positive reevaluation and self-blame best predicted purpose in life, a component that was repeatedly found to be related to better mental functioning (Skrabski, Kopp, Rozsa, Rethelyi, & Rahe, 2005). Regarding emotion regulation strategies, self-acceptance was best predicted by high levels of putting into perspective and positive reevaluation, as well-as low levels of self-blame, which are in line with previous research (Kállay & Vonas, 2011). Of the six emotion regulation strategies, positive reevaluation predicts best autonomy, the ability to function independently of other's approval, to regulate emotions and behavior from within, establishing personal standards and evaluating oneself towards this standard, a very important component especially in times of turmoil, where it is extremely difficult to take adaptive decisions. Environmental mastery and personal growth on the other hand were significantly predicted by behavioral emotion regulation strategies as actively approaching the source of stress and seeking distractions, while autonomy and self-acceptance by low levels of withdrawal. These results are also in line with previous research as presented in the introductory part of this paper. Of the demographic variables only gender proved to be a significant predictor in the case of positive relations with others, environmental mastery, personal growth and purpose in life. Satisfaction with family income predicted only positive relations with others and environmental mastery. The role of contentment with the financial situation of the family in environmental mastery seems extremely plausible, since the capacity to deal with concrete situations oftentimes requires instrumental means, as sufficient financial resources.

Based on these findings, we may consider perceived stress, and especially perceived helplessness, a very important factor that may play a significant role in the way subjective and psychological well-being unfold in such times of great psychological turmoil. Future studies may focus on the investigations of factors that are subjacent to the way university students may enhance their abilities and beliefs in these abilities to deal efficiently with stressful situations.

Naturally, our study has several limitations that have to be taken into account. First of all, we have to emphasize the fact that our results were obtained through retrospective, self-report measures that might have had biased to some degree the authenticity of the collected data. Secondly, we have concentrated on a narrow segment of intrinsic student characteristics (emotion regulation strategies) that obviously offers a partial image of the situation. However, as literature indicates, student well-being is dependent on a much larger number of intrapersonal factors (e.g., personality, attachment styles, resilience, hardiness, cognitive flexibility, etc.), as well as inter-personal and micro/macro-cultural factors related to the cultural and social specificities characteristic to the proximal and distal environment students live (family, friends), and study (academic milieu, specificities of the academic culture, of the entire educational system, the requirements of the job market, etc.). Thus, we propose that future studies concentrate to treat in-depth these aspects as well.

Finally, we consider that our results may be useful in the development of prevention and intervention programs, targeting the enhancement of the psychological functioning of Romanian students in such difficult periods.

Acknowledgement

This research was supported by a 2022 Domus Hungarica senior research scholarship/grant (87/23/2022/HTMT) awarded by the Hungarian Scientific Academy to Éva Kállay.

REFERENCES

ABC News (2022). Russia presses invasion to outskirts of Ukrainian capital. ABC News. Retrieved on the 30th of April 2022. https://abcnews.go.com/International/wireStory/russia-attacks-ukraine-defiant-putin-warns-us-nato-83078619.

Allan, S., & Gilbert, P. (1995). A social comparison scale: psychometric properties and relationship to psychopathology. *Journal of Personality and Individual Differences, 19,* 293-299.

Arnett, J. J. (2014). *Emerging adulthood: The winding road from the late teens through the twenties.* New York: Oxford University Press.

Arora, T., Grey, I., Östlundh, L., Lam, K. B. H., Omar, O. M., & Arnone, D. (2022). The prevalence of psychological consequences of COVID-19: A systematic review and meta-analysis of observational studies. *Journal of Health Psychology, 27*(4), 805-824. https://doi.org/10.1177/1359105320966639

Atanes, A.C.M., Andreoni, S., Hirayama, M.S., Montero-Marin, J., Barros, V. V., Ronzani, T. M., Kozasa, E. H., Soler, J., Cebolla, A., Garcia-Campayo, J., & Demarzo, M. M. P. (2015). Mindfulness, perceived stress, and subjective well-being: a correlational study in primary care health professionals. *BMC Complementary and Alternative Medicine, 15,* 303. https://doi.org/10.1186/s12906-015-0823-0

Auerbach, R. P., Mortier, P., Bruffaerts, R., Alonso, J., Benjet, C., Cuijpers, P., ... Kessler, R. C. (2018). WHO World Mental Health Surveys International College Student Project: Prevalence and distribution of mental disorders. *Journal of Abnormal Psychology, 127*(7), 623–638. https://doi.org/10.1037/abn0000362

Avotney A. (2014). Students under pressure. *Monit Psychol, 45*, 36.

Bao, Y., Sun, Y., Meng, S., Shi, J., & Lu, L. (2020). 2019-nCoV epidemic: Address mental health care to empower society. *Lancet, 395*(10224), e37-e8.

Barden, N., & Caleb, R. (Eds.). (2019). *Student mental health and wellbeing in higher education: A practical Guide*. London, UK: Sage.

Bauman, Z. (2007). *Liquid times: Living in an age of uncertainty*. Cambridge: Polity.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive Therapy of Depression.* New York: The Guilford Press.

Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S. M., & Olfson, M. (2008). Mental health of college students and their non-college-attending peers: Results from the National Epidemiologic Study on Alcohol and Related Conditions. *Archives of General Psychiatry, 65*(12), 1429-37. https://doi.org/10.1001/archpsyc.65.12.1429

Bourmistrova, N. W., Solomon, T., Braude, P., Strawbridge, R., & Carter, B. (2022). Long-term effects of COVID-19 on mental health: A systematic review. *Journal of Affective Disorders, 299,* 118-125. https://doi.org/10.1016/j.jad.2021.11.031

Brown, J. S. L. (2018). Student mental health: some answers and more questions. *Journal of Mental Health, 27*(3), 193-196.

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research, 287,* 112934. https://doi.org/10.1016/j.psychres.2020.112934

Carleton, R. N., Mulvogue, M. K., Thibodeau, M. A., McCabe, R. E., Antony, M. M., & Asmundson, G. J. G. (2012). Increasingly certain about uncertainty: Intolerance of uncertainty across anxiety and depression. *Journal of Anxiety Disorders, 26*(3), 468-479, https://doi.org/10.1016/j.janxdis.2012.01.011

Carleton, R. N., Norton, P. J., & Asmundson, G. J. G. (2007). Fearing the unknown: A short version of the Intolerance of Uncertainty Scale. *Journal of Anxiety Disorders, 21,* 105-117.

Carleton, R. N., Sharpe, D., & Asmundson, G. J. G. (2007). Anxiety sensitivity and intolerance of uncertainty: requisites of the fundamental fears? *Behavior Research and Therapy, 45,* 2307–2316. https://doi.org/10.1016/j.brat.2007.04.006

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56,* 267-283.

Cespuglio, R., Strekalova, T., Spencer, P., Román, G., Reis, J., Bouteille, B., & Buguet, A. (2021). SARS-CoV-2 infection and sleep disturbances: nitric oxide involvement and therapeutic opportunity. *Sleep, 44*(3). https://doi.org/10.1093/sleep/zsab009

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385–396. https://doi.org/10.2307/2136404

Colwell, R. R., & Machlis, G. E. (2019). *Science During Crisis: Best Practices, Research Needs, and Policy Priorities* (pp. 32). Cambridge, MA: American Academy of Arts and Sciences.

Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., ... Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological Bulletin, 143,* 939–991. https://doi.org/10.1037/bul0000110

Curran, T., & Hill, A.P. (2017). Perfectionism is increasing over time: A metaanalysis of birth cohort differences from 1989 to 2016. *Psychological Bulletin, 145*(4), 410-42.

Daher, A., Balfanz, P., Cornelissen, C., Müller, A., Bergs, I., Marx, N., Müller-Wieland, D., Hartmann, B., Dreher, M., Müller, T., (2020). Follow up of patients with severe coronavirus disease 2019 (COVID-19): Pulmonary and extrapulmonary disease sequelae. *Respiratory Medicine, 174,* 106197. https://doi.org/10.1016/j.rmed.2020.106197

David, D., & Dobrean, A. (2012). *Inventarul de Depresie Beck - (BDI - II).* Romanian Psychological Testing Services.

Dogan, T. (2018). Problem areas of students at a university psychological counselling centre: A 16- year analysis. *British Journal of Guidance & Counselling, 46,* 429–440. https://doi.org/10.1080/03069885.2018.1437255

Drum, D. J., Brownson, C., Denmark, A. B., & Smith, S. E. (2009). New data on the nature of suicidal crises in college students: shifting the paradigm. *Professional Psychology: Research and Practice, 40*(3), 213-222.

Dugas, M. J., & Robichaud, M. (2007). *Cognitive-behavioral treatment for generalized anxiety disorder: from science to practice.* New York, NY: Routledge.

Dugas, M. J., Freeston, M. H., & Ladouceur, R. (1997). Intolerance of uncertainty and problem orientation in worry. *Cognitive Therapy & Research, 21,* 593–606.

Ebrahim, A. H., Dhahi, A., Husain, M. A., & Jahrami, H. (2022). The Psychological Well-Being of University Students amidst COVID-19 Pandemic. Scoping review, systematic review and meta-analysis. *Sultan Qaboos University Medical Journal, 22(*2), 179–197. https://doi.org/10.18295/squmj.6.2021.081

Endler, N. S., & Parker, J. D. A. (1990). Multidimensional assessment of coping: A critical evaluation. *Journal of Personal and Social Psychology, 58,* 844–854.

Erzen, E., & Çikrikçi Ö. (2018). The effect of loneliness on depression: A meta-analysis. *International Journal of Social Psychiatry, 64*(5), 427–435. https://doi.org/10.1177/0020764018776349

Esch, P., Bocquet, V., Pull, C., Couffignal, S., Lehnert, T., Graas, M., et al. (2014). The downward spiral of mental disorders and educational attainment: A systematic review on early school leaving. *BMC Psychiatry 14,* 237. https://doi.org/10.1186/s12888-014-0237-4

Fegert, J. M., & Schulze, U. M. E. (2020). COVID-19 and its impact on child and adolescent psychiatry - a German and personal perspective. *Irish Journal of Psychological Medicine, 37,* 243-245. https://doi.org/10.1017/ipm.2020.43

Fernández-Abascal, E. G., & Martín-Díaz, M. D. (2021). Longitudinal study on affect, psychological well-being, depression, mental and physical health, prior to and during the COVID-19 pandemic in Spain. *Personality and Individual Differences, 17*. https://doi.org/110591.10.1016/j.paid.2020.110591

Folkman, S., & Lazarus, R. S. (1989). *Manual of the Ways of Coping Questionnaire*. Palo Alto: Consulting Psychologists Press.

Garnefski, N., & Kraaij, V. (2006). Relationships between cognitive emotion regulation strategies and depressive symptoms: A comparative study of five specific samples. *Personality and Individual Differences, 40,* 1659–1669.

Garnefski, N., Boon, S., & Kraaij, V. (2003). Relationships between cognitive strategies of adolescents and depressive symptomatology across different types of life event. *Journal of Youth and Adolescence, 32,* 401–408.

Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences, 30,* 1311–1327.

Garnefski, N., Kraaij, V., & Spinhoven, P. (2002). *Manual for the use of the Cognitive Emotion Regulation Questionnaire. A questionnaire measuring cognitive coping strategies.* Leiderdorp: DATEC.

Garnefski, N., Teerds, J., Kraaij, V., Legerstee, J. & Van den Kommer, T. (2003). Cognitive emotion regulation strategies and depressive symptoms: Differences between males and females. *Personality and Individual Differences, 25*, 603-611.

Giannopoulou, I., Galinaki, S., Kollintza, E., Adamaki, M., Kympouropoulos, S., Alevyzakis, E., Tsamakis, K., Tsangaris, I., Spandidos, D. A., Siafakas, N., Zoumpourlis, V., & Rizos, E. (2021). COVID-19 and post-traumatic stress disorder: The perfect 'storm' for mental health (Review). *Experimental and Therapeutic Medicine, 22*(4), 1162. https://doi.org/10.3892/etm.2021.10596

Golden-Kreutz, D. M., Browne, M. W., Frierson, G. M., & Andersen, B. L. (2004). Assessing stress in cancer patients: a second-order factor analysis model for the perceived stress scale. *Assessment 11,* 216–223. https://doi.org/10.1177/1073191104267398

Greco, V., & Rogers, D. (2003). Uncertainty, stress, and health. *Personality and Individual Differences, 34,* 1057–1068.

Grenier, S., Barrette, A.-M., & Ladouceur, R. (2005). Intolerance of uncertainty and intolerance of ambiguity: similarities and differences. *Personality and Individual Differences, 39,* 593–600. https://doi.org/10.1016/j.paid.2005.02.014

Gross, J. J., & Thompson, R. A. (2007). Emotion Regulation: Conceptual Foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–24). The Guilford Press.

Gvozden, T. V., Baucal, A., Krstic, K., & Filipović, S. (2021). Intolerance of Uncertainty and Tendency to Worry as Mediators Between Trust in Institutions and Social Support and Fear of Coronavirus and Consequences of the Pandemic. *Frontiers in Psychology, 12,* 737188. https://doi.org/10.3389/fpsyg.2021.737188

Hasan, M. J., Tabssum, T., Ambia, N. E., Zaman, M. S., Rahman, M., & Khan, A. S. (2021). Mental Health of the COVID-19 Patients in Bangladesh. *Mymensingh Medical Journal, 30*(1), 189–195. https://doi.org/10.1016/j.jad.2021.11.031

Husky, M. M., Kovess-Masfety, V., & Swendsen, J. D. (2020). Stress and anxiety among university students in France during Covid-19 mandatory confinement. *Comprehensive Psychiatry, 102,* 152191. https://doi.org/10.1016/j.comppsych.2020.152191

Joormann, J., & Stanton, C. H. (2016). Examining emotion regulation in depression: A review and future directions. *Behavior Research and Therapy, 86,* 35–49.

Kahneman, D., Diener, E., & Schwartz, N. (Eds.). (1999). *Well-being: The foundations of hedonic psychology.* New York: Russell Sage Found.

Kállay, É., & Rus, C. L. (2014). Psychometric properties of the 44-item version of Ryff's Psychological Well-Being Scale. *European Journal of Psychological Assessment, 30*(1), 15-21. https://doi.org/10.1027/1015-5759/a000163

Kállay, É., & Vonas, G. (2011). Demographic and intrapersonal characteristics of well-being in a sample of Romanian adults. *Journal of Cognitive and Behavioral Psychotherapies, 11*(2), 253-273.

Kato, T. (2015). Frequently used coping scales: A meta-analysis. *Stress Health, 31,* 315–323.

Kaye, A. D., Okeagu, C. N., Pham, A. D., Silva, R. A., Hurley, J. J., Arron, B. L., Sarfraz, N., Lee, H. N., Ghali, G. E., Gamble, J. W., Liu, H., Urman, R. D., & Cornett, E. M. (2021). Economic impact of COVID-19 pandemic on healthcare facilities and systems: International perspectives. *Best Practice & Research Clinical Anaesthesiology, 35*(3), 293-306, https://doi.org/10.1016/j.bpa.2020.11.009

Keane, T. M., & Barlow, D. H. (2002). Posttraumatic stress disorder. In: D. H. Barlow (Ed.), *Anxiety and its disorders* (pp. 418–453). New York: Guilford.

Kessler, R., Amminger, P. G., Aguilar-Gaxiola, S., Alonso, J., Lee, S., & Ustün, T. B. (2007). Age of onset of mental disorders: A review of recent literature. *Current Opinions in Psychiatry, 20*, 359–364.

Kraaij, V., & Garnefski, N. (2019). The Behavioral Emotion Regulation Questionnaire: Development, psychometric properties and relationships with emotional problems and the Cognitive Emotion Regulation Questionnaire. *Personality and Individual Differences, 137,* 56–61. https://doi.org/10.1016/j.paid.2018.07.036

Kruisselbrink Flatt, A. K. (2013). A suffering generation: Six factors contributing to the mental health crisis in North American higher education. *College Quarterly, 16*(1). Retrieved on the 10th of August 2022, from https://files.eric.ed.gov/fulltext/EJ1016492.pdf

Lanzetta, J. T., & Driscoll, J. M. (1966). Preference for information about an uncertain but unavoidable outcome. *Journal of Personality and Social Psychology, 3,* 96–102.

Limcaoco, R. S. G., Mateos, E. M., Fernandez, J. M., & Roncero, C. (2020). Anxiety, worry and perceived stress in the world due to the COVID-19 pandemic. Preliminary results. *medRxiv*. https://doi.org/10.1101/2020.04.03.20043992

Lipson, S., & Eisenberg, D. (2017). Mental health and academic attitudes and expectations in university populations: Results from the healthy minds study. *Journal of Mental Health, 27*(3), 205-213. https://doi.org/10.1080/09638237.2017.1417567

Megreya, A. M., Latzman, R. D., Al-Attiyah, A. A., & Alrashidi, M. (2016). The robustness of the nine-factor structure of the Cognitive Emotion Regulation Questionnaire across four Arabic-speaking Middle Eastern countries. *Journal of Cross-Cultural Psychology, 47*, 875–890.

Meherali, S., Punjani, N., Louie-Poon, S., Abdul Rahim, K., Das, J. K., Salam, R. A., & Lassi, Z. S. (2021). Mental Health of Children and Adolescents Amidst COVID-19 and Past Pandemics: A Rapid Systematic Review. *International Journal of Environmental Research and Public Health*, *18*(7), 3432. https://doi.org/10.3390/ijerph18073432

Mercier, G., Arquizan, C., & Roubille, F. (2020). Understanding the effects of COVID-19 on health care and systems. *The Lancet, 5,* e536. https://doi.org/10.1016/S2468-2667(20)30213-9

Moscone, F., Tosetti, E., & Vittadini, G. (2016). The impact of precarious employment on mental health: The case of Italy. *Social Science & Medicine, 158*, 86-95. https://doi.org/10.1016/j.socscimed.2016.03.008

Otto, C., Reiss, F., Voss, C., Wüstner, A., Meyrose, A-K., Hölling, H., & Ravens-Sieberer, U. (2021). Mental health and well-being from childhood to adulthood: design, methods and results of the 11-year follow-up of the BELLA study. *European Child and Adolescent Psychiatry, 30,* 1559–1577. https://doi.org/10.1007/s00787-020-01630-4

Pereira, S., Early, N., Outar, L., Dimitrova, M., Walker, L., & Dzikiti, C. (2020). University Student Mental Health Survey 2020 A large scale study into the prevalence of student mental illness within UK universities. Retrieved on the 10th of August 2022 from https://assets.website-files.com/602d05d13b303dec233e5ce3/60305923a557c3641f1a7808_Mental%20Health%20Report%202019%20(2020).pdf

Pereira, S., Reay, K., Bottell, J., Walker, L., Dzikiti, C., Platt, C., & Goodrham, C. (2019). University Student Mental Health Survey 2018: A large scale study into the prevalence of student mental illness within UK universities. Retrieved on the 10th of August 2022 from https://uploads-ssl.webflow.com/561110743bc7e45e78292140/5c7d4b5d314d163fecdc3706_Mental%20Health%20Report%202018.pdf

Pervin, L. A. (1963). The need to predict and control under conditions of threat. *Journal of Personality, 31*, 570–587.

Phelan, A. L., Katz, R., & Gostin, L. O. (2020). The novel coronavirus originating in Wuhan, China: Challenges for global health governance. *JAMA*. https://doi.org/10.1001/jama.2020.1097

Pothoff, S., Garnefski, N., Miklósi, M., Ubbiali, A., Dominguez-Sanchez, F. J., Martins, E. C., ... Kraaij, V. (2016). Cognitive emotion regulation and psychopathology across cultures: A comparison between six European countries. *Personality and Individual Differences, 98,* 218–224.

Roberti, J. W., Harrington, L. N., & Storch, E. A. (2006). Further psychometric support for the 10−item version of the perceived stress scale. *Journal of College Counseling, 9,* 135–147. https://doi.org/10.1002/j.2161-1882.2006.tb00100.x

Rosen, N. O., Ivanova, E., & Knäuper, B. (2013). Differentiating intolerance of uncertainty from three related but distinct constructs. *Anxiety Stress Coping, 27,* 55–73.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57,* 1069-1081.

Ryff, C. D. (2014). Psychological Well-Being Revisited: Advances in the Science and Practice of Eudaimonia. *Psychotherapy and Psychosomatics, 83,* 10–28. https://doi.org/10.1159/000353263

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69,* 719-727.

Ryff, C. D., & Singer, B. H. (1998). The contours of positive human health. *Psychological Inquiry, 9,* 1-28.

Ryff, C. D., & Singer, B. H. (2000). Interpersonal flourishing: A positive health agenda for the new millennium. *Personality and Social Psychology Review, 4*, 30-44.

Ryff, C. D., & Singer, B. H. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies, 9,* 13-39.

Salari, N., Khazaie, H., Hosseinian-Far, A., Khaledi, B., and Eskandari, S. (2020). The prevalence of stress, anxiety and depression within front-line healthcare workers caring for COVID-19 patients: a systematic review and meta-regression. *Human Resources for Health, 18*, 1–14. https://doi.org/10.1186/s12960-020-00544-1

Shah, K., Mann, S., Singh, R., Bangar, R., & Kulkarni, R. (2020). Impact of COVID-19 on the Mental Health of Children and Adolescents. *Cureus 12*(8), e10051. https://doi.org/10.7759/cureus.10051

Sivertson, B., Hysing, M., Knapstad, M., Harvey, A. G., Reneflot, A., Lønning, K. J., & O'Connor, R. C. (2019). Suicide attempts and non-suicidal self-harm among university students: Prevalence study. *British Journal of Psychology (Open), 5*(2), e26. https://doi.org/10.1192/bjo.2019.4

Skrabski, A., Kopp, M., Rozsa, S., Rethelyi, J., & Rahe, R. H. (2005). Life meaning: an important correlate of health in the Hungarian population. *International Journal of Behavioral Medicine, 12,* 78-85.

Sloan, E., Hall, K., Moulding, R., Bryce, S., Mildred, H., & Staiger, P. K. (2017). Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: A systematic review. *Clinical Psychology Review, 57,* 141–163.

Staehr Johansen, K. (1998). The use of well-being measures in primary health care - the DepCare project; in World Health Organization, Regional Office for Europe: Well-Being Measures in Primary Health Care - the DepCare Project. *Geneva: World Health Organization, 12,* E60246.

Storrie, K., Ahern, K., & Tuckett, A. (2010). A systematic review: Students with mental health problems – a growing problem. *International Journal of Nursing Studies, 16*(1), 1-6.

Sullivan, M. J. L., Bishop, S. R., & Pivik, J. (1995). The Pain Catastrophizing Scale: Development and validation. *Psychological Assessment, 7*(4), 524–532. https://doi.org/10.1037/1040-3590.7.4.524

Tang, S., Xiang, M., Cheung, T., & Xiang, Y-T. (2021). Mental health and its correlates among children and adolescents during COVID-19 school closure: The importance of parent-child discussion. *Journal of Affective Disorders, 279,* 353-360. https://doi.org/10.1016/j.jad.2020.10.016

Tavares, A. I. (2017). Telework and health effects review. *International Journal of Healthcare, 3*(2), 30-36. https://doi.org/10.5430/ijh.v3n2p30

Tennen, H., & Affleck, G. (1990). Blaming others for threatening events. *Psychological Bulletin, 108*, 209-232.

Tolin, D. F., Abramowitz, J. S., Brigidi, B. D., & Foa, E. B. (2003). Intolerance of uncertainty in obsessive-compulsive disorder. *Journal of Anxiety Disorders, 17,* 233–242.

Twenge, J. M., & Kasser, T. (2013). Generational changes in materialism and work centrality, 1976-2007: Associations with temporal changes in societal insecurity and materialistic role modeling. *Personality and Social Psychology Bulletin, 39*(7), 883-897.

Unger, K. (2007). *Handbook on supported education: Providing services for students with psychiatric disabilities.* Charleston SC: Book Surge Publishing.

Vergara-Buenaventura, A., Chavez-Tuñon, M., & Castro-Ruiz, C. (2020). The mental health consequences of Coronavirus disease 2019 Pandemic in dentistry. *Disaster Medicine and Public Health Preparedness, 5*, 1-4. https://doi.org/10.1017/dmp.2020.190

Verhaeghe, P. (2014). *What about me? The Struggle for identity in a market based society*. London, UK: Scribe Publications.

Vindegaard, N., & Benros, M. E. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain Behavior, and Immunity, 89,* 531–542. https://doi.org/10.1016/j.bbi.2020.05.048

Virtanen, M., Kivimaki, M., Joensuu, M., Virtanen, P., Elovainio, M., & Vahtera, J. (2005). Temporary employment and health: A review. *International Journal of Epidemiology, 34,* 610-622. https://doi.org/10.1093/ije/dyi024

Walton, M., Murray, E., & Christian, M. D. (2020). Mental health care for medical staff and affiliated healthcare workers during the COVID-19 pandemic, *European Heart Journal. Acute Cardiovascular Care*, *9*(3), 241–247, https://doi.org/10.1177/2048872620922795

Waterman, A. S. (1993). Two conceptions of happiness: Contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *Journal of Personality and Social Psychology, 64,* 678-691.

WHO (2017). *Depression and other common mental disorders – Global health estimates.* Geneva: WHO Document Production Services.

Wong, P. T. P., & Fry, P. S. (Eds.). (1998). *The Human quest for meaning: A handbook of psychological research and clinical applications.* Mahwah, NJ: Erlbaum.

Zeng, N., Zhao, Y. M., Yan, W., Li, C., Lu, Q-D., Liu, L., *et al.* (2022). A systematic review and meta-analysis of long term physical and mental sequelae of COVID-19 pandemic: Call for research priority and action. *Molecular Psychiatry*. https://doi.org/10.1038/s41380-022-01614-7

Zhu, J., Sun, L., Zhang, L., Wang, H., Fan, A., Yang, B., et al. (2020). Prevalence and influencing factors of anxiety and depression symptoms in the first-line medical staff fighting against COVID-19 in Gansu. *Frontiers in Psychiatry, 11,* 386. https://doi.org/10.3389/fpsyt.2020.00386

Zlomke, K. R., and Jeter, K. M. (2014). Stress and worry: Examining intolerance of uncertainty's moderating effect. *Anxiety Stress Coping, 27,* 202–215. https://doi.org/10.1080/10615806.2013.835400

STUDIA UBB PSYCHOL.-PAED., LXVII, 2, 2022, p. 65-87
(Recommended Citation)
DOI:10.24193/subbpsyped.2022.2.03

DEPRESSION, ANXIETY, STRESS, AND COPING MECHANISM DURING COVID-19 PANDEMIC

Alexandru-Filip POPOVICI[1*], Sebastian VAIDA[2*]

ABSTRACT. The current pandemic due to the COVID-19 virus has caught the entire world by surprise, on all aspects of life, from economic and work-related ones to education and online communication. Psychological health issues are not an exception to this rule, as people have been forced to either stay indoors during lockdown periods, or completely change their habits for longer periods of time. In this study, we investigated the effects of the pandemic on a sample of 241 adults, on several concepts. The study is relevant for understanding the factors that can contribute to maintaining a balance in life, especially in times of hardship.

Keywords: anxiety, coping, Covid-19, depression, stress.

Introduction

The impact of COVID-19 pandemic on mental health is greater for people with anxiety-related disorders. Wang et al. (2020) found that during the initial response to the pandemic outbreak in China, from 1210 respondents more than half (53.8%) rated the psychological impact of the outbreak as moderate or severe. In a study on 500 respondents from Hong Kong, Choi et al. (2020) found that 19% of them had experienced depression and 14% symptoms related to anxiety. In Ireland, more than 27,7% from 1041 respondents were screened positive for depression and generalized anxiety during the first week of

[1] Faculty of Psychology and Educational Sciences, Department of Psychology, University of Bucharest, 90 Panduri Street, Bucharest, Romania, filip.popovici@unibuc.ro
[2] Faculty of Psychology and Educational Sciences, Department of Psychology, Babeş-Bolyai University, No. 37, Republicii Street, Cluj-Napoca, Romania, sebastianvaida@psychology.ro
* Corresponding authors: filip.popovici@unibuc.ro; sebastianvaida@psychology.ro

lockdown measures (Hyland et al., 2020). It is important to note that these percentages are higher than similar reports from studies conducted before the COVID-19 pandemic. In another large study from China from multiple provinces, the results showed that the level of psychological distress was higher, 29.9% of the respondents experienced mild to moderate symptoms associated with depression (Qiu et al., 2020). These results are emphasized by a recent meta-analysis on studies conducted during the COVID-19 that screened for depression. Results showed that the prevalence of depression was 7 times higher, from 3.44% in 2017 to 25% in 2020 (Bueno-Notivol, 2021).

One explanation for higher depression, stress and anxiety during the COVID-19 lies in the information overload characterized by contradictory information issued by various international or local authorities (Choi et al., 2020). At the same time, a higher exposure to social media is another variable that can explain an increased level of anxiety (Choi et al., 2020; Gao et al., 2020). Asmundson et al. (2020) found that people with anxiety-related disorders were more predisposed to isolation reporting increased fear of contamination, xenophobia, or high-stress levels.

During the Covid-19 Pandemic, people have used all sorts of coping strategies, from problem focused strategies to emotion focused ones, socially supported strategies (Zacher & Rudolph, 2021), or avoidance coping ones (Carver et al., 1989). A study by Taylor et al. (2020) on people with a high level of stress regarding the strategies used for coping with COVID-19 showed that they preferred to be active in trying to cope with isolation. They tried to cope in an adaptive manner by setting a routine or connecting with other people online but also experienced maladaptive strategies such as over-eating or consuming drugs and alcohol (Taylor et al., 2020).

Related to the behavior of those who were in stressful conditions, Barziley et al. (2020) found that respondents reported more worries about others and not about themselves, fear that one of their family members will get Covid-19, and a fear about the possibility of spreading the virus. These prosocial behaviors when external circumstances are stressful are considered a form of resilience in the face of the pandemic outbreak, and a form of altruism for overcoming adversity (Barzilay et al., 2020; Southwick et al., 2005).

In a sample of adults from the Spanish general population results showed that following a balanced diet, not reading the news, engaging in a pleasant activity, and staying outdoors were predictors of a low level of anxiety and depression (Fullana et al., 2020). Among the factors that generated a high level of anxiety was the loss of job, symptoms associated with COVID-19, negative life events and following a treatment related to mental health problems in the last three months, as well as caring for a person (Fullana et al., 2020).

In a longitudinal study from Serbia during the emergency state due to pandemics that assessed the changes in four emotional states (worry, fear, boredom, and anger) for five weeks, results showed a decrease in all four emotional states over time, starting with worry, followed by fear and boredom (Sadiković et al., 2020). Being in an unfamiliar situation increases the degree of fear and worry, but at the same time new strategies of coping are emerging which modify behavioral reactions in relation to the negative circumstances (Sadiković et al., 2020).

Among the most predisposing factors to anxiety, stress and depression were the female gender, student status, and having physical symptoms (Wang et al., 2020). In a study conducted by Fitzpatrick, Harris, and Drawve (2020) on US sample adults, results showed that socially vulnerable respondents (women, unmarried, not working, or Hispanic) were the most prone to depression due to the lack of resources to help them to get through this period. Fear of COVID-19 was the most prevalent feeling having a direct influence on symptoms associated with depression (Fitzpatrick et al. 2020). Also, in Italy, during the initial phase of the COVID-19 pandemic, results from a study showed high levels of distress, females being more prone to increased anxiety, stress, and depression (Mazza et al., 2020). Losada-Baltar et al. (2020) obtained similar results on 1310 Spanish people where female participants reported higher distress associated with the COVID-19 outbreak. In another research, the authors have found that women are more predisposed to a high level of anxiety and depression, meaning that the impact of the COVID-19 pandemic is more powerful on women than on men (Özdin & Özdin, 2020).

The impact of rational and irrational beliefs on depression, anxiety and stress

In the ABC model of Rational Emotional Behavioral Therapy (REBT), people live positive or negative experiences developing rational and irrational beliefs about them (Balkis & Duru, 2019). Also, these beliefs have an impact on emotional, cognitive, and behavioral reactions (Balkis & Duru, 2019). Rational beliefs have an adaptive character, they are healthier and have a protective role in terms of response to stress, depression, or anxiety (David et al., 2005; Hyland et al., 2014; Balkis & Duru, 2019).

At the opposite pole are irrational beliefs that refer to the absolutist demands, catastrophizing thoughts, the need to be liked by others, or the lack of tolerance regarding tension or emotions (Balkis & Duru, 2019). Previous research showed that irrational beliefs are associated with depression, anxiety,

and symptoms related to post-traumatic stress disorder (Oltean et al., 2017; Vîslă et al., 2016; Balkis & Duru, 2019; Chan & Sun, 2020). Moreover, in a meta-analysis regarding the relationship between irrational beliefs and distress, results showed that overall irrational beliefs were positive associated with anxiety, depression, and stress (Vîslă et. al., 2016).

Rational beliefs can act as protective factors against negative experiences, current findings showing a positive association with happiness and optimism due to a greater acceptance of oneself and flexibility (Oltean et al., 2019). Related to COVID-19 pandemic the research is somehow limited regarding the effects of irrational beliefs on depression, anxiety and stress. A study done by Hashemi et al. (2020) found a significant indirect effect of irrational beliefs on fear of COVID-19, this finding being attributed to the fact that there may be some individual psychological variables, such as the level of sensitivity to anxiety that may lead to fear or other emotional reactions. Moreover, the effect of irrational beliefs through catastrophic thinking could be found in cases of suicide due to COVID-19 pandemic and also in the increased concern regarding mental health during the pandemic (Goyal et al., 2020; Gunnel et al., 2020; Mamun & Griffits, 2020).

Methodology and sampling

Participants

A total of 241 people responded to the questionnaire's items, with demographic factors as seen in Table 1 and as following: 16.5% males and 83.5 females, with age ranging from 18 to 78, a mean age of 30.34 (SD=10.63), with 87% coming from urban areas and 13% from rural ones. As for the marital status, 35% declared to be married, 60% not married and 5% have not declared any option.

Table 1. Demographics of the sample

Demographic		**N / (%)**
Age		18-78 (M = 30.34, SD = 10.63)
Gender identity		
	Males	40 / 16.5%
	Females	241 / 83.5%
Provenience		
	Urban	210 (87%)
	Rural	31 (13%)

Demographic		**N / (%)**
Marital Status		
	Married	85 (35%)
	Not married	145 (60%)
	Not replying	11 (5%)
Isolated with		
	Alone	30 (12.5%)
	Family	165 (68.5%)
	Partner / Friends	46 (19%)
Living during the Pandemic		
	Apartment	142 (58.7%)
	House	93 (38.4%)
	Other	7 (2.9%)
Now living in… area		
	Urban	42 (17.4%)
	Rural	199 (82.6%)
Education		
	Highschool	100 (41.3%)
	Faculty	81 (33.5%)
	Masters' / MBA	50 (20.6%)
	PhD	10 (4.5%)

Instruments

For this research, we used a set of four validated instruments: General Attitude Beliefs Scale (Lindner, Kirkby, Wertheim, & Birch, 1999), Brief Cope (Carver, 1997; Carver, Scheier, & Weintraub, 1989), Social Emotional Competences Development Inventory (Seal, Beauchamp, Miguel, Scott, Naumann, Dong, & Galal, 2012), and DASS21 (Lovibond & Lovibond, 1995). The purpose was to assess how people deal with the stress and anxiety triggered by the current worldwide pandemic, and the influence that their thinking style and social-emotional competences might have. We will briefly discuss each scale, in the interest of understanding their core measures and psychometrics.

General Attitude Beliefs Scale. This scale has good psychometric properties (Bernard, 1988), with a total of 26 items structured around 7 factors (Rationality, Self-Downing, Need for Achievement, Need for Approval, Need for Comfort, Demands for Fairness, Other Downing). The scale can be administered both individually and collectively, on a 5-points Likert scale, ranging from 1=strongly disagree to 5=strongly agree.

Brief COPE. The Brief-COPE scale is a self-report, 28 item measure, that assesses how effective or ineffective someone is at coping with stressful situations. The scale can be used to measure both how the general population copes with adversity such as bad personal news, and how patients deal with negative diagnosis news (Carver, 1997). Initial and subsequent analysis (Carver et al., 1989; Eisenberg, Shen, Schwarz, & Mallon, 2012), indicated two main factors for this scale: Avoidant Coping and Approach Coping, where the first factor shows a style that is less effective for managing anxiety, while the ladder is mainly associated with a better response to adversity and a more stable emotional response. Avoidant Coping includes the following subscales: Self-distraction, Denial, Substance use, Behavioral disengagement, Venting, and Self-blame, while the Approach Coping includes: Active coping, Emotional support, Use of informational support, Positive reframing, Planning, and Acceptance. There are two subscales, Humor and Religion, that do not load on either Avoidance or Approach coping.

Social Emotional Competences Development Inventory (SECDI). This instrument has 32 items, self-report inventory developed by Seal et al. (2012) that measures how people perceive themselves and how others might perceive them, measuring 8 competences (emotions, aptitude, empathy, monitoring, sociability, intimacy, initiative, and inspiration) on four factors (Self Awareness, Consideration of Others, Connection to Others and Influence Orientation). Self-Awareness is seen as the ability to understand your own emotions, to assess your strengths and weaknesses and to recognize your preferences, and it includes three categories: emotional self-awareness, a correct self-evaluation, and a tendency identification. A second factor is Consideration of Others, which includes empathy and monitoring your thoughts and actions. A third factor is Connection to Others and involves sociability and intimacy, namely the ease of building relations and communicating with trust and honesty. The fourth factor is Influence Orientation, which includes initiative and inspiration, or the ability to motivate and inspire others (Seal, Naumann, Scott, & Royce-Davis, 2011).

DASS21. The name of this scale is an acronym that stands for Depression Anxiety and Stress Scale and encompasses 21 items, along three axes (depression, anxiety, and stress). The scale has an excellent internal consistency of .94, very good convergent validity and diagnostic utility (Gloster, Rhoades, Novy, Klotsche, Senior, Kunik, Wilson, & Stanley, 2008).

Procedure

The study was approved by the Babeş-Bolyai University Ethical Committee (No. 2214/5.03.2021) and was conducted in compliance with the declaration of Helsinki. This research involved an anonymous survey administered online. There were no email addresses, names or personal identifiers requested. Data was collected in the months of April and May 2020, targeting adults from Romania, Europe. In the introductory part of the survey, we provided an informed consent, and the completion of the survey was considered as a consent for participation in the study. Participants in the study were found through convenience and snowball sampling, using methods such as personal contact, social media, and diverse professional networks.

Results

Distress in the Covid-19 Pandemic context

At the moment of the evaluation, a number of 158 respondents (65.6%) indicated an above average level of rationality on the GABS scale, while 29 respondents (9.9%) showed a very low or low level of rationality, and 54 respondents (22.4%) showed an average rationality. As for the level of irrationality, there were 112 respondents (46.5%) that had a very low or low level of irrationality, 75 (31.1%) of the respondents with an average level and 54 (22.4%) with a high or very high level or irrationality. The rest of the values for the scales that comprise the level of irrationality, can be seen in Table 2.

Table 2. Values for GABS scale

	Rationality	**Own global evaluation**	**Achievement**	**Approval**	**Comfort**	**Demand for justice**	**Others global evaluation**	**Irrationality**
Very low or low	29 12%	79 32.8%	64 33.2%	73 30,3%	113 46,8%	98 40,7%	74 30,8%	112 46,5%
Average	54 22.4%	98 40,7%	75 31%	83 34,4%	88 36,6%	57 23.7%	103 42,7	75 31,1%
High or very high	158 65.6%	64 26,5%	102 35,8%	85 35,3%	40 16,6%	86 35,6%	64 26,5%	54 22,4%

Coping strategies in the Covid-19 Pandemic

As for the data recorded on the Brief Cope scale, we have decided to divide the results in half - a lower half, consisting of answers of 1 and 2, and an upper half, consisting of answers of 3 and 4, as seen in Table 3. Since the scale does not have a clear cutoff point, we have decided upon this approach, to help gain clarity in comparison. A number of 72 respondents (30%) have engaged in an avoidance type of coping behaviors, whilst the majority of the respondents (70%) have scored in the lower half of the results on the Avoidance Coping subscale of the Brief Cope scale. Similarly, 62.7% of the respondents had results in the upper half of the scale. This shows that most of our respondents used strategies that are beneficial to them and engaged less in harming or avoiding behaviors. Regarding self-distraction, 69% of the respondents have used this strategy, while 65% have seeked emotional support. Also, the use of informational support can be seen in our study too, as 60% of the respondents have used this coping strategy.

In our sample, religion was not a strategy used by most of the respondents, instead humor was, with 71.4% of respondents using humor as a coping strategy. Although in this scale, humor is not included in either avoidance or approach scales, it is still a widely used self-protection strategy (Fritz, Russek & Dillon, 2017). Moreover, positive reframing was used by 82.2% of the respondents, planning by 75% of the respondents and acceptance coping by 85%.

Table 3. Respondent's values to Brief Cope scale

Subscale	Lower half	Upper half
Self-distraction (Avoidant)	66 (31%)	175 (69%)
Active coping (Approach)	37 (15.3%)	204 (84.7%)
Denial (Avoidant)	197 (82%)	44 (18%)
Substance use (Avoidant)	207 (86%)	34 (14%)
Emotional support (Approach)	84 (35%)	157 (65%)
Use of informational support (Approach)	97 (40%)	144 (60%)
Behavioural disengagement (Avoidant)	208 (86.3%)	33 (13.7%)
Venting (Avoidant)	103 (42.7%)	138 (57.3%)
Positive reframing (Approach)	43 (17.8%)	198 (82.2%)
Planning (Approach)	53 (22%)	188 (78%)
Acceptance (Approach)	36 (15%)	205 (85%)
Self-blame (Avoidant)	129 (53.5%)	112 (56.5%)
AVOIDANCE	169 (70%)	72 (30%)
APPROACH	90 (37.3%)	151 (62.7%)
Religion*	133 (55.2%)	108 (44.8%)
Humor*	69 (28.6%)	172 (71.4%)

*Humor and Religion are neither Approach or Avoidance coping

Coping strategies in the Covid-19 Pandemic

It is safe to say that no one was truly prepared for what the Covid-19 Pandemic brought, not just in terms of health and economic problems, but also in terms of socializing and dealing with emotional issues that otherwise might have not been noticed. The fact that roughly the entire world population had to work from home, avoid meeting with other people, and changing habits, meant that some might adapt better than others. And if social emotional competences are useful in normal times, then in times like the pandemic, they have become a must, and this can be best done in educational settings, that can teach children and adolescents such skills (Hadar, Ergas, Alpert & Ariav, 2020).

In the model proposed by Seal et al. (2011), the results achieved in the Social Emotional Competences Development Inventory (SECDI) are to be ranked from the highest to the lowest, where the value ranking first is considered a level of mastery, the one ranked second is a competence, third is a threshold and the last one is to be developed. As can be seen in table 4, the respondents have mastery in social awareness, namely in emotions control and the aptitude of identifying those emotions and knowing why they feel how they feel. Then, they have competences in empathy and monitoring, which belong to the factor - consideration of others.

Table 4. Mean values for the main factors and competences of SECDI

		Ranking order							
Factor	**Competence**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Self-Awareness	Emotions	29.31							
Self-Awareness	Aptitude		27.92						
Consideration of Others	Empathy			27.69					
Consideration of Others	Monitoring				27.23				
Consideration of Others	Intimacy					26.81			
Influence Orientation	Inspiration						23.78		
Connection to Others	Sociability							22.99	
Influence Orientation	Initiative								21.75
		Mastery		Competence		Threshold		Development	

They have the threshold for intimacy and inspiration. And the need for development is for sociability and initiative, which makes total sense, since one of the main characteristics of the pandemic was the inability to socialize and take new initiative, due to restrictions and unpredictability. Of course, there is

cautiousness needed when looking at these results, since the differences are not that large between the results for each category, except perhaps between the first and last two.

Depression, anxiety, and stress in the Covid-19 Pandemic context

These three psychological constructs (depression, anxiety, and stress) have been measured with DASS21 and the results can be seen in Table 5. In relation with depression, 50.2% (n = 121) of the sample had normal levels of depression and 21.6% (n = 52) moderate levels. Only 9.1% (n = 22) and 7.9% (n = 19) of the sample had experienced severe or extremely severe depressive symptoms. Regarding anxiety, 51% (n = 111) had normal levels, 10.4% (n = 25) had severe anxiety, and 5.8% (n = 14) of the respondents experienced extremely severe anxiety. As for stress, 51% (n = 123) had normal levels, 10.4% (n = 25) severe, and 5.8% (n = 14) extremely severe symptoms.

Table 5. Percentages of people experiencing depression, anxiety, and stress

	Depression	**Anxiety**	**Stress**
Normal	121 (50.2%)	111 (46%)	123 (51%)
Low	27 (11.2%)	35 (14.5%)	30 (12.4%)
Moderate	52 (21.6%)	33 (13.7%)	49 (20.4%)
Severe	22 (9.1%)	27 (11.3%)	25 (10.4%)
Extremely severe	19 (7.9%)	35 (14.5%)	14 (5.8%)

Correlational Analysis

Table 6. Pearson correlations, descriptive statistics, and α coefficients (N = 241)

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Measure**	**Mean**	**SD**	**α**
Age	-.151*	.002	-.137*	-.258**	-.011	.018	.061	-.215	-.223**	-.195**				
1. Avoidance coping		.158*	-.090	.799**	-.011	-.031	.393**	.557**	.480**	.474**	Brief Cope	25.44	4.88	.70
2. Approach coping			.355**	.548**	.400**	.312**	-127*	-.175**	.005	-.013	Brief Cope	36.79	5.23	.80
3. Self-Awareness					.655**	.491**	-.126*	-.240**	-.138*	-.132*	SECDI	57.24	9.04	.88
4. Consideration of Others						.328**	-.216**	-.227**	-.174**	-.181**	SECDI	54.93	8.23	.82
5. Connection to Others						.667**	-.185**	-.333***	-.132*	-.116	SECDI	49.80	9.86	.83
6. Influence Orientation							-.024	-.183**	-.051	-.080	SECDI	45.54	11.35	.88
7. Irrationality								.331**	.339**	.359**	GABS	22.67	4.17	.91

Variables	1	2	3	4	5	6	7	8	9	10	Measure	Mean	SD	α
8. Depression									.415**	.713**	DASS 21	17.39	4.31	.88
9. Anxiety										.648**	DASS 21	22.77	2.84	.85
10. Stress											DASS 21	22.08	5.13	.89

*p < .05, **p < .01.

Table 6 presents correlations between the studied variables, and also lists descriptive statistics and internal consistency coefficients (Cronbach Alpha).

Age indicated a significant and negative association with depression (*r* = - .21, p < .01), anxiety (r = -.22, p < .01) and stress (*r* = -.19 p < .01), meaning that the younger the age, the more prone someone is to experience those states, and they decrease as people advance in age. As expected, avoidance coping was significantly and positively associated with irrationality (*r* = .39, p < .01), depression (*r* = .55, p < .01), anxiety (*r* = .48, p < .01), and stress (*r* = .47, p < .01). The relation between irrationality and approach coping was significant yet negative (*r* = -.12, p < .05), showing that the lower the level of irrationality, the more someone will use an approach coping.

Approach coping was positively and significantly associated with self-awareness (*r* = .35, p < .01), consideration of others (*r* = .40, p < .01), connection to others (*r* = .41, p < .01) and influence orientation (*r* = .31, p < .01) and negatively significantly associated with the depression factor of DASS21 (*r* = - .17, p < .01) which means that the better someone is at coping the less prone is to become depressed.

Connection to others, which is characterized by sociability and intimacy, was significantly and negatively connected to depression (*r* = - .33, p< .01). Influence Orientation was negatively and significantly associated with depression (*r* = - .18, p < .01) which means that the more prone you are in taking initiative, trying new things, and motivating others to be inspired by your example, the less depressed you will be. Age was negatively associated with avoidance coping (*r* = - .15, p < .05), and positively associated with self-awareness (*r* = .13, p < .05). Irrationality was positively and significantly associated with depression (*r* = .33, p < .01), anxiety (*r* = .33, p < .01), and stress (*r* = .35, p < .01). Self-awareness, consideration of others and connection to others were negatively and significantly associated with irrationality (*r* = - .12, p < .05; *r* = - .21, p < .01; *r* = - 18, p < .01) and anxiety (*r* = - .13, p < .05; (*r* = - .17, p < .01; *r* = - .13, p < .05) (only in connection to self-awareness), showing that someone with a low level of irrational thinking can have a better control over emotions.

In terms of differences between men and women, we noticed no differences on any of the scales or subscales used in the study (Table 7). Because there was a big difference in the sample size regarding men and women, we randomized samples from the women group several times, and each time, the results indicated no differences from the men. Which means that both men and women used the same coping strategies and social-emotional competences. Also, the levels of depression, anxiety and stress are very similar for both genders.

Table 7. Gender differences

Scale/subscale	t	Sig.	Scale/subscale	t	Sig.	Scale/subscale	t	Sig.
GABS			B COPE			B COPE		
Rationality	.936	.352	Self-distraction	-.309	.758	Positive reframing	-.253	.801
Own global evaluation	-.730	.467	Active coping	-1.662	.100	Planning	-1.095	.277
Achievement	-.888	.377	Denial	-2.631	.010	Acceptance	.404	.688
Approval	-1.096	.277	Substance use	1.485	.142	Self-blame	1.523	.132
Comfort	-.812	.419	Emotional support	-.245	.731	Avoidance	.096	.924
Demand for justice	-1.031	.306	Use of info support	.073	.942	Approach	-.747	.457
Others global evaluation	.449	.655	Behavioral disengagement	1.223	.225	Religion	-1.305	.196
Irrationality	-.957	.341	Venting	-2.007	.048	Humor	2.384	.020
SECDI			SECDI			DASS21		
Self-awareness emotions	-1.173	.244	Connection with others – Sociability	-1.072	.287	Depression	.709	.480
Self-awareness Aptitude	-.622	.536	Connection with others – Intimacy	-2.974	.400	Anxiety	-.814	.418
Consideration of others - Empathy	-1.537	.128	Influence orientation - Initiative	.049	.961	Stress	-1.343	.183
Consideration of others - Monitoring	-2.133	.036	Influence orientation - Inspiration	-.356	.723			

Regression analysis of rationality/irrationality

Because we noticed a significant and positive association between irrationality and the concepts of depression, anxiety, and stress, we continued our analysis with an in-depth correlation analysis between all the dimensions of irrationality (need for achievement, need for approval, need for comfort, demand for fairness, self-downing, other downing) and the three previously mentioned concepts. Also, we noticed a negative and significant association between depression, anxiety and stress and rationality. Simply put, these data show what the REBT theory also proved, that if you approach a rational thinking style, then it is less probably to suffer from depression, anxiety, or stress and vice versa, an irrational thinking style will increase the likelihood of such problems.

Table 8. Correlation analysis or rationality/irrationality and depression, anxiety, and stress

Variables	1	2	3	4	5	6	7	8	9	10	11	Mean	SD
1. Rationality		-.240**	-.100	-.258**	-.276**	-.038	-.322**	-.159*	-.279*	-.241**	-.236**	15.95	2.23
2. Total Irrationality			.811**	.799**	.832**	.788**	.672*	.639*	.331**	.339**	.359**	60.48	13.01
3. Need of achievement				.548**	.626**	.599**	.472**	.322**	.336**	.318**	.346**	12.07	3.43
4. Need of approval					.616**	.569**	.502**	.480**	.195**	.260**	.265**	7.86	2.36
5. Need for comfort						.539**	.585**	.418**	.309**	.314**	.321**	10.71	2.82
6. Demand for fairness							.270**	.532**	.213**	.242**	.278**	13.07	3.32
7. Self-downing								.267**	.275**	.273**	.271**	8.98	2.75
8. Other downing									.150**	.108**	.121**	7.79	2.39
9. Depression										.713**	.736**	5.79	4.68
10. Anxiety											.747**	4.94	4.32
11. Stress												7.98	4.70

*p < .05, **p < .01

Then, we decided upon conducting multiple regression analysis to establish which of the irrational beliefs categories better predict depression, anxiety, and stress significantly. As can be seen in table 9, results show that depression was significantly predicted by the need for achievement (B = .363, *SE* = .094, *p* < .001) and self-downing (B = .255, *SE* = .117, *p* < .05). These two dimensions of irrational beliefs (need for achievement and self-downing) account for 13% of the variance for depression. Anxiety was significantly predicted by the need for achievement (B = .400, *SE* = .077, *p* < .001) and need for comfort (B = .290, *SE* = .119, *p* < .05). These two dimensions of irrational beliefs (need for achievement and need for comfort) account for 12% of the variance for anxiety. Stress was significantly predicted by the need for achievement (B = .326, *SE* = .106, *p* < .001) and need for comfort (B = .287, *SE* = .129, *p* < .05). These two dimensions of irrational beliefs (need for achievement and need for comfort) account for 14% of the variance for stress.

Table 9. Regression analysis for irrationality subscales and depression, anxiety and stress

		Depression		
Predictor	**B**	**SE**	**t**	**R^2 model**
Need for achievement	.363	.094	3.87**	13**
Self-downing	.255	.117	2.7*	
		Anxiety		
Need for achievement	.400	.077	5.18**	12**
Need for comfort	.290	.119	2.43*	
		Stress		
Need for achievement	.326	.106	3.08**	14**
Need for comfort	.287	.129	2.23*	

*p < .05; **p < .001

To investigate the research question about the relationship between cognitive processes and depression, anxiety and stress, a moderation analysis was performed using PROCESS macro in SPSS. The outcome variable of the analysis was the level of depression, anxiety and stress, the predictor variable was the level of irrationality, and the moderator variable was the level of rationality (Table 10).

Table 10. Moderation role of rational beliefs

	Depression			
Predictor	**B**	**SE**	**t**	**R^2 model**
Irrational beliefs (IB)	.36	.11	3.11**	17**
Rational beliefs (RB)	.57	.46	1.23*	
IB x RB	-.01	.00	.02	
	Anxiety			
Irrational beliefs (IB)	.26	.11	2.42**	12**
Rational beliefs (RB)	.31	.42	.72*	
IB x RB	-.01	.00	-1.5	
	Stress			
Irrational beliefs (IB)	.31	.11	2.65**	14**
Rational beliefs (RB)	.42	.46	.91*	
IB x RB	-.01	.00	-1.7*	

For the relationship between irrational beliefs and depression, the results of the moderation analysis showed that irrational beliefs (B = .36, SE = .11, p < .001), and the interaction effect of the irrational and rational beliefs was significant too (B = -.01, SE = .01, p < .05). Regarding the relationship between irrational beliefs and anxiety, the results of the moderation analysis indicated a significant effect of irrational beliefs (B = .26, SE = .11, p < .05), and the interaction effect between the irrational and rational beliefs. As for the relationship between irrational beliefs and stress, the results of the moderation analysis showed that irrational beliefs (B = .31, SE = .11, p < .001), and the interaction effect of the irrational and rational beliefs was significant too (B = -.01, SE = .01, p < .05).

As can be seen from figure 1, the results show that the relationship between irrational beliefs and depression / anxiety / stress is stronger when the level of rational beliefs is low.

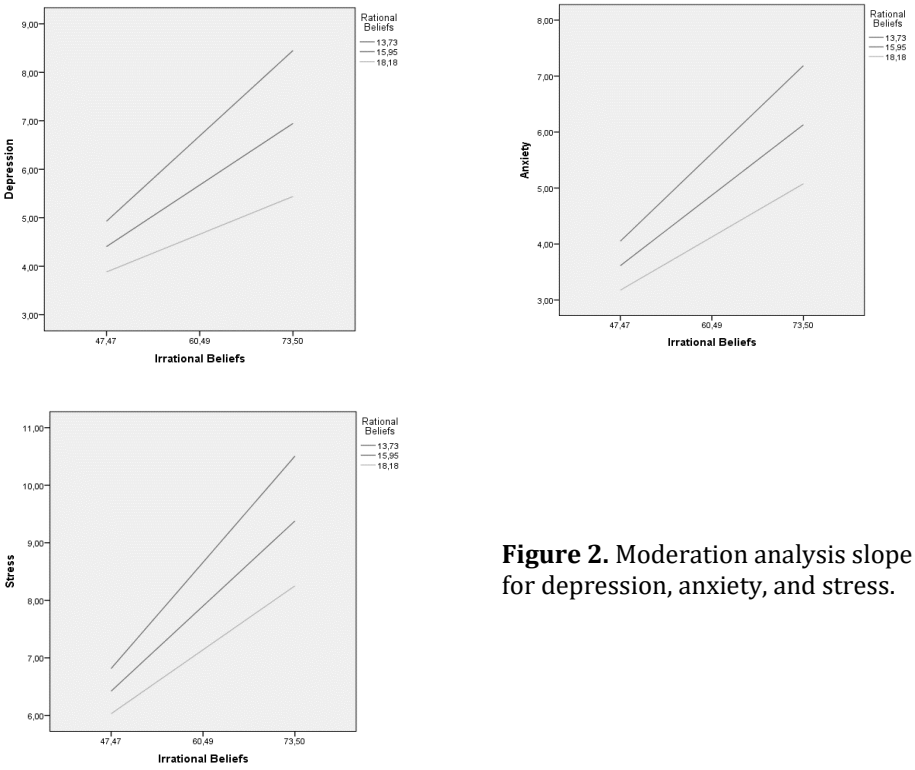


Figure 2. Moderation analysis slope for depression, anxiety, and stress.

Discussion

GABS scale

Related to GABS scale, results showed that most of the sample had an above average level of rationality (158 respondents or 65,6%), while 54 respondents (22.4%) indicated an average rationality. This is conclusive with the results achieved on the same scale on the level of irrationality, where almost half of the respondents (46.5%) experienced a very low or low level of irrationality, while 31.1% had an average level and 22.4% a high or very high level or irrationality. We remind the reader that this scale measures the general attitudes beliefs as seen in the Rational Emotive Behavior Therapy developed by Ellis (1979), on 7 factors (Rationality, Self-Downing, Need for Achievement, Need for Approval, Need for Comfort, Demands for Fairness, Other Downing).

Since we made the evaluation at the beginning of the pandemic, it is expected to have a lower level of irrationality and a high or moderate level of rationality in the respondents. Future investigations are needed to evaluate whether the level of irrationality has increased, now when more than one year has passed since the beginning of the worldwide pandemic.

Coping strategies

Most respondents used positive strategies in coping with Covid-19 and were less engaged in harming behaviors. Our results are conclusive with other recent studies (Park, Russell, Fendrich, Finkelstein-Fox, Hutchinson, & Becker, 2020) which unveiled that some of the main strategies for coping with the Covid-19 situation were self-distraction, active coping, and social-emotional support. Emotional support regards empathy, encouragement, and kindness (Saha, Torous, Caine, & De Choudhury, 2020) and is paramount in times of crisis, along with informational support, which is about information and guidance.

Positive reframing, planning and acceptance were three other types of approach coping strategies used by the participants in this study, and they are significantly and positively associated with reducing stress and adapting to aversive situations (Shanahan, Steinhoff, Bechtiger, Murray, Nivette, Hepp, Ribeaud, & Eisner, 2020). Positive reframing is the ability or behavior of perceiving in a positive light something that was previously seen as negative (Lambert, Fincham & Stillman, 2012) and was used by 82.2% of the respondents in our study. Planning is seen as a means of devising a strategy and considering the necessary steps to take, and in our study, it was used by 75% of the respondents, which is consistent with other studies on the topic (MacIntyre, Gregersen, & Mercer, 2020).

Acceptance coping is seen as a strategy that allows you to relate to uncontrollable events in an accepting manner, by learning to change the narrative concerning those events and adopting an adaptive response (Polizzi, Lynn & Perry, 2020). In our study, the acceptance coping was used by a large number of respondents (85%), thus proving that people turned to the right type of strategies to cope with the unknown and adapt to adversity (Linley & Joseph, 2004; Zhang, Chung & Bu, 2017).

It seems that religion is not seen as a strategy in coping with Covid-19 pandemic, in opposition with humor which acts as a mechanism of coping and has an important role in dealing with pandemic threat. Somehow, our results can be explained by Kranz et al. (2020) who found that higher levels of religiosity predict unreasonable behavior in relation to Covid-19 pandemic and emotional responses, which for our sample was not the case.

Depression, anxiety, and stress

Like other studies our results showed that severe and moderate levels of depression, anxiety, and stress are present but in our case for a low percentage of respondents (Alzueta et al., 2020; Wang et al., 2020). Half of the respondents experienced normal levels of depression, anxiety, and stress, which means that there are no concerns. Regardless of the results, it is important to remember that DASS21 is a quantitative measure of distress and not a measure for clinical diagnosis. Therefore, even a moderate level is still below a clinical threshold. With this information in mind, it is comforting to notice that a small proportion of the respondents have experienced depression, anxiety, or stress at an extremely severe level. This has to do, of course, with their approach coping style and social-emotional competences, which allow them to use specific coping strategies such as positive reframing and acceptance, or emotional regulation. This does not mean that people in the Covid-19 Pandemic have not been affected by the situation. Rather than, with the proper coping style and competences, any adversity can be overcome.

Correlational analysis and regression

Results showed negative association between age and depression, anxiety and stress and positive association between avoidance coping and irrationality, depression, anxiety, and stress. This is something to be expected because, compared to approach coping, this type of avoidance coping is less effective at managing anxiety and stress. Avoidance coping is comprised by the subscales of denial, substance use, venting, behavioral disengagement, self-distraction, and self-blame, most of which are also encountered in the concept of irrationality, as approached in the theory of Rational Emotive Behavior Therapy or REBT (DiGiuseppe, Doyle, Dryden, & Backx, 2013).

Approach coping was positively and significantly associated with subscales of self-awareness, consideration of others, connection to others and influence orientation, and negatively significantly associated with the depression factor of DASS21, which means that the better someone is at coping the less prone is to become depressed. This is also expected, since the approach coping encompasses scales of active coping, positive reframing, acceptance and seeking emotional control, which lead to a better response to adversity and better emotional responses. This is similar to other research which found that in coping with the pandemic, people are not passive but are putting all their efforts into making the context more tolerable (Taylor et al., 2020).

Moreover, connection to others was negatively correlated with depression, meaning that the more social respondents were to other people in general and in times of adversity such as the Covid-19 pandemic, the less prone they were to become depressed. Also, one of the SECDI subscale, the influence orientation which refers to the ability to motivate others was negatively associated with depression. These results are in line with previous research which showed that social connection has the potential to mitigate the negative psychological consequences of the pandemic (Tull et al., 2020; Wu, 2020).

In line with previous studies, we observed positive correlations between irrationality and depression, anxiety, and stress, meaning that the more someone is predisposed to irrational beliefs, the more they will face depression, stress and anxiety (Oltean et al., 2017; Vîslă et al., 2016; Balkis & Duru, 2019; Chan & Sun, 2020; Goyal et al., 2020). In the ABC model of REBT therapy, irrational beliefs refer to catastrophizing thoughts about the self. In the context of Covid-19 pandemic, among other factors the fear about personal health or the fear of infecting others or the stigma associated with having the disease can act as triggers for psychological stress which may develop anxiety and depression (Brooks et al., 2020; Rajkumar, 2020; Sanderson et al., 2020).

In relation to this the results of the regression analysis are congruent with data from other studies (Balkis & Duru, 2019), and the REBT theory (Ellis, 2003b). Also, they are expected in the times of novelty and uncertainty such as the Covid-19 pandemic when most of the world population was confined to work from home and adapt to a new reality of communication and telework. In this new reality, we see three main predictors for depression, anxiety, and stress, and those are the irrational beliefs of need for achievement, need for comfort and self-downing. Since everyone became their own boss in the work from home reality, we see no need for approval as a predictor for depression, anxiety, and stress, and the demand for fairness is lacking, since everyone is in the same situation. Also, other downing is also low or non-significant because there is no one to blame, except for the virus itself. Of course, we exclude from this equation the people that believe in the conspiracy theories, and which might consider others to blame for the whole virus situation.

Although worldwide an increase in the level of irrationality and other psychological problems was expected, our study shows that it is not the case. People managed to maintain their level of irrationality low and their level or rationality moderate or quite high. Also, we did not encounter an increase in the levels of depression, anxiety, or stress, investigated with DASS21. Only 9.1% experienced severe depressive symptoms, 5.8% experienced severe anxiety and 5.8% extreme stress, which is way below the general worldwide average.

Another variable is related to the area of living. For those living in urban areas, the COVID-19 pandemic is affecting more strongly the mental health status (Özdin & Özdin, 2020). Moreover, the environment in which the person is in isolation is another important factor. Those who lived alone had lower stress scores than those who lived with one or more other people (Taylor et al., 2020). On the contrary, we did not find any data to support the previous statement, and there were no differences between those who lived alone and those who lived with someone, in terms of depression, anxiety or stress. However, interesting enough is that we noticed a significant difference in the scores between those who lived alone and those who lived with someone in the same house, during the pandemic lockdown, namely that those living with other people used more often positive reframing ($t(239)=2.349$, $p=.05$) and experienced a higher level of rationality ($t(239)=2.065$, $p=.05$).

Also, the place that people were isolated in had a great importance. Those who lived in apartments experienced a stronger feeling of injustice, because they felt that a basic right was taken away, namely the right to travel or go outside their house. Those living in a house, experienced a much lower level of injustice or none. An independent-samples t-test was conducted to compare the level of general attitude beliefs, in two conditions - people living in apartments during the pandemic lockdown and people living in houses (with or without a yard). There was a significant difference in the scores for *need for justice* subscale, from the General Attitude Beliefs Scale (GABS): $t(239)=-3.323$, $p=.001$. Besides this, there were no other differences regarding the respondents, on the other scales and subscales.

Of course, there is caution when looking at these data, because of the lower number of respondents and the timing of the evaluation. It is possible that re-evaluating these concepts one year later, we will discover different values, with a possible increase in depression, especially for the categories of people that live marginalized from society, in remote areas or for elderly people. Also, an increase in anxiety and stress is expected because more time has passed than most of us have initially estimated it would, regarding the pandemic. We therefore intend to do this study again on a larger sample, to analyze whether things have changed one year later. Also, we are interested to discover what people have learned after living for one year with the Covid-19 virus and this sort of new world order.

Funding: No funding was received for the completion of this study.

Conflicts of interest/Competing interests: The authors have no conflict of interest to declare.

Availability of data and material: Data available on request.

Author contribution: All authors contributed equally.

REFERENCES

Asmundson, G. J., Paluszek, M. M., Landry, C. A., Rachor, G. S., McKay, D., & Taylor, S. (2020). Do pre-existing anxiety-related and mood disorders differentially impact COVID-19 stress responses and coping?. *Journal of Anxiety Disorders*, 102271.

Alzueta, E., Perrin, P., Baker, F. C., Caffarra, S., Ramos-Usuga, D., Yuksel, D., & Arango-Lasprilla, J. C. (2021). How the COVID-19 pandemic has changed our lives: A study of psychological correlates across 59 countries. *Journal of clinical psychology*, *77*(3), 556–570. https://doi.org/10.1002/jclp.23082

Balkıs, M., Duru, E. (2019). The Protective Role of Rational Beliefs on the Relationship Between Irrational Beliefs, Emotional States of Stress, Depression and Anxiety. J Rat-Emo Cognitive-Behav Ther 37, 96–112. https://doi.org/10.1007/s10942-018-0305-7

Barzilay, R., Moore, T. M., Greenberg, D. M., DiDomenico, G. E., Brown, L. A., White, L. K., Gur, R. C., & Gur, R. E. (2020). Resilience, COVID-19-related stress, anxiety and depression during the pandemic in a large population enriched for healthcare providers. *Translational psychiatry*, *10*(1), 1-8. https://doi.org/10.1038/s41398-020-00982-4

Bernard, M. (1998). Validation of General Attitude and Belief Scale. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*. 16. 183-196. 10.1023/A:1024911014579.

Brasseur, S., Grégoire, J., Bourdu, R, Mikolajczak, M. (2013). The Profile of Emotional Competence (PEC): Development and Validation of a Self-Reported Measure that Fits Dimensions of Emotional Competence Theory. PLoS ONE 8(5): e62635. doi:10.1371/journal.pone.0062635

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The lancet*, *395*(10227), 912-920.

Bueno-Notivol, J., Gracia-García, P., Olaya, B., Lasheras, I., López-Antón, R., & Santabárbara, J. (2021). Prevalence of depression during the COVID-19 outbreak: a meta-analysis of community-based studies. *International journal of clinical and health psychology*, *21*(1), 100196. https://doi.org/10.1016/j.ijchp.2020.07.007

Carver, C. S. (1997). You want to measure coping but your protocol is too long: Consider the brief cope. International journal of behavioral medicine, 4(1), 92-100.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: a theoretically based approach. Journal of personality and social psychology, 56(2), 267.

Chan, H. W. Q., & Sun, C. F. R. (2020). Irrational beliefs, depression, anxiety, and stress among university students in Hong Kong. *Journal of American College Health*, 1-15. https://doi.org/10.1080/07448481.2019.1710516

Choi, E. P. H., Hui, B. P. H., & Wan, E. Y. F. (2020). Depression and anxiety in Hong Kong during COVID-19. *International journal of environmental research and public health*, *17*(10), 3740. https://doi.org/10.3390/ijerph17103740

David, D., Montgomery, G. H., Macavei, B., & Bovbjerg, D. H. (2005). An empirical investigation of Albert Ellis's binary model of distress. *Journal of Clinical Psychology, 61*(4), 499–516.

DiGiuseppe, R., Doyle, K., Dryden, W., & Backx, W. (2013). A Practitioner's Guide to Rational-Emotive Behavior Therapy. New York, NY: Oxford University Press.

Ellis, A. (1979). The Theory of Rational Emotive Therapy. In A. Ellis, J.M. Whiteley (Eds). *Theoretical and Empirical Foundation of Rational Emotive Therapy*, Monterey, CA, Broos Cole.

Ellis, A. (2003b). Discomfort anxiety: A new cognitive-behavioral construct (part I). *Journal of Rational-Emotive & Cognitive-Behavior Therapy,* 21(3–4), 183–191.

Eisenberg, S. A., Shen, B. J., Schwarz, E. R., & Mallon, S. (2012). Avoidant coping moderates the association between anxiety and patient-rated physical functioning in heart failure patients. *Journal of behavioral medicine*, 35(3), 253-261.

Fitzpatrick, K. M., Harris, C., & Drawve, G. (2020). Living in the midst of fear: Depressive symptomatology among US adults during the COVID-19 pandemic. *Depression and anxiety,* 1-8. https://doi.org/10.1002/da.23080

Fritz, H. L., Russek, L. N., & Dillon, M. M. (2017). Humor use moderates the relation of stressful life events with psychological distress. *Personality and Social Psychology Bulletin, 43*(6), 845–859. https://doi.org/10.1177/0146167217699583.

Fullana, M. A., Hidalgo-Mazzei, D., Vieta, E., & Radua, J. (2020). Coping behaviors associated with decreased anxiety and depressive symptoms during the COVID-19 pandemic and lockdown. *Journal of Affective Disorders*. https://doi.org/10.1016/j.jad.2020.06.027

Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., Wang Y., Fu, H., & Dai, J. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *Plos one*, *15*(4), e0231924. https://doi.org/10.1371/journal.pone.0231924

Gloster, A. T., Rhoades, H. M., Novy, D., Klotsche, J., Senior, A., Kunik, M., Wilson, N., & Stanley, M. A. (2008). *Psychometric properties of the Depression Anxiety and Stress Scale-21 in older primary care patients. Journal of Affective Disorders, 110(3), 248–259.* doi:10.1016/j.jad.2008.01.023

Gunnell, D., Appleby, L., Arensman, E., Hawton, K., John, A., Kapur, N., Khan, M., O'Connor, R., Pirkis, J. (2020). Suicide risk and prevention during the COVID-19 pandemic. *The Lancet Psychiatry*, *7*(6), 468-471. https://doi.org/10.1016/S2215-0366(20)30171-1

Goyal, K., Chauhan, P., Chhikara, K., Gupta, P., & Singh, M. P. (2020). Fear of COVID 2019: First suicidal case in India !. *Asian journal of psychiatry*, *49*, 101989. https://doi.org/10.1016/j.ajp.2020.101989

Hadar, L.L., Ergas, O., Alpert, B., & Ariav, T. (2020) Rethinking teacher education in a VUCA world: student teachers' social-emotional competencies during the Covid-19 crisis, European Journal of Teacher Education, 43:4, 573-586, DOI: 10.1080/02619768.2020.1807513

Hashemi, S. G. S., Hosseinnezhad, S., Dini, S., Griffiths, M. D., Lin, C. Y., & Pakpour, A. H. (2020). The mediating effect of the cyberchondria and anxiety sensitivity in the association between problematic internet use, metacognition beliefs, and fear of COVID-19 among Iranian online population. *Heliyon*, *6*(10), e05135. https://doi.org/10.1016/j.heliyon.2020.e05135

Hyland, P., Shevlin, M., McBride, O., Murphy, J., Karatzias, T., Bentall, R. P., Vallières, F. (2020). Anxiety and depression in the Republic of Ireland during the COVID-19 pandemic. *Acta Psychiatrica Scandinavica*, *142*(3), 249-256.https://doi.org/10.1111/acps.13219

Hyland, P., Shevlin, M., & Adamson, G. (2014). The moderating role of irrational beliefs in the relationship between irrational beliefs and posttraumatic stress symptomology. *Behavioural and Cognitive Psychotherapy, 42*, 312–326.

Lambert, N. M., Fincham, F. D., & Stillman, T. F. (2012). *Gratitude and depressive symptoms: The role of positive reframing and positive emotion. Cognition & Emotion, 26(4), 615–633.* doi:10.1080/02699931.2011.595393

Lindner, H., Kirkby, R., Wertheim, E., & Birch, P. (1999). *Cognitive Therapy and Research, 23(6), 651–663.* doi:10.1023/a:1018741009293

Linley, P. A., & Joseph, S. (2004). *Positive change following trauma and adversity: A review. Journal of Traumatic Stress, 17(1), 11–21.* doi:10.1023/b:jots.0000014671.27856.7e

Losada-Baltar, A., Jiménez-Gonzalo, L., Gallego-Alberto, L., Pedroso-Chaparro, M. D. S., Fernandes-Pires, J., & Márquez-González, M. (2021). "We Are Staying at Home." Association of self-perceptions of aging, personal and family resources, and loneliness with psychological distress during the lock-down period of COVID-19. *The Journals of Gerontology: Series B*, *76*(2), e10-e16. https://doi.org/10.1093/geronb/gbaa048

Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety & Stress Scales. (2nd Ed.) Sydney: Psychology Foundation.

Mamun, M. A., & Griffiths, M. D. (2020). First COVID-19 suicide case in Bangladesh due to fear of COVID-19 and xenophobia: Possible suicide prevention strategies. *Asian journal of psychiatry*, *51*, 102073. https://doi.org/10.1016/j.ajp.2020.102073

Mazza, C., Ricci, E., Biondi, S., Colasanti, M., Ferracuti, S., Napoli, C., & Roma, P. (2020). A nationwide survey of psychological distress among italian people during the COVID-19 pandemic: Immediate psychological responses and associated factors. *International Journal of Environmental Research and Public Health*, *17*(9), 3165.

MacIntyre, P. D., Gregersen, T., & Mercer. S. (2020). Language teachers' coping strategies during the Covid-19 conversion to online teaching: Correlations with stress, wellbeing and negative emotions, System, Volume 94, 102352, ISSN 0346-251X, https://doi.org/10.1016/j.system.2020.102352.

Oltean, H. R., Hyland, P., Vallières, F., & David, D. O. (2017). An empirical assessment of REBT models of psychopathology and psychological health in the prediction of anxiety and depression symptoms. *Behavioural and Cognitive Psychotherapy*. https://doi.org/10.1017/S1352465817000133.

Oltean, H. R., Hyland, P., Vallières, F., & David, D. O. (2019). Rational beliefs, Happiness and optimism: an empirical assessment of REBT's model of psychological health. *International Journal of Psychology*, *54*(4), 495-500. https://doi.org/10.1002/ijop.12492

Park, C.L., Russell, B.S., Fendrich, M., Finkelstein-Fox, L., Hutchinson, M., & Becker, J. (2020). Americans' COVID-19 Stress, Coping, and Adherence to CDC Guidelines. *J GEN INTERN MED* 35, 2296–2303. https://doi.org/10.1007/s11606-020-05898-9

Polizzi, C., Lynn, S.J., Perry, A. (2020). Stress and Coping in the Time of COVID-19: Pathways to Resilience and Recovery. Clinical Neuropsychiatry, 17 (2), 59-62. https://doi.org/10.36131/

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General psychiatry*, *33*(2).doi: 10.1136/gpsych-2020-100213

Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. *Asian Journal of Psychiatry, 52*, 1–5. https://doi.org/10.1016/j.ajp.2020.102066.

Saha, K., Torous, J., Caine, E.D., De Choudhury, M. (2020). Psychosocial Effects of the COVID-19 Pandemic: Large-scale Quasi-Experimental Study on Social Media. *J Med Internet Res*; 22(11):e22600. DOI: 10.2196/22600

Sanderson, W. C., Arunagiri, V., Funk, A. P., Ginsburg, K. L., Krychiw, J. K., Limowski, A. R., ... & Stout, Z. (2020). The nature and treatment of pandemic-related psychological distress. *Journal of contemporary psychotherapy*, *50*(4), 251-263.

Seal, C.R., Naumann, S., Scott, A. & Royce-Davis, J. (2011). *Social-emotional development: a new model of student learning in higher education*. Research in Higher Education Journal, 10, 1 – 13.

Seal, C. R., Beauchamp, K.L., Miguel, K., Scott, A., Naumann, S.E., Dong, Q., Galal, S. (2012). Validation of a self-report instrument to assess social and emotional development, *Research in Higher Education Journal*, 15, 1-20.

Shanahan, L., Steinhoff, A., Bechtiger, L., Murray, A., Nivette, A., Hepp, U., Ribeaud, D., & Eisner, M. (2020). Emotional distress in young adults during the COVID-19 pandemic: Evidence of risk and resilience from a longitudinal cohort study. *Psychological Medicine,* 1-10. doi:10.1017/S003329172000241X

Southwick, S., Vythilingam, M. & Charney, D. (2005). The psychobiology of depression and resilience to stress: Implications for prevention and treatment. Annu. Rev. Clin. Psychol. 1, 255–291.

Sadiković, S., Branovački, B., Oljača, M., Mitrović, D., Pajić, D., & Smederevac, S. (2020). Daily monitoring of emotional responses to the coronavirus pandemic in Serbia: A citizen science approach. *Frontiers in psychology*, *11*, 2133. https://doi.org/10.3389/fpsyg.2020.02133

Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., & Asmundson, G. (2020). COVID stress syndrome: Concept, structure, and correlates. *Depression and anxiety*, *37*(8), 706–714. https://doi.org/10.1002/da.23071

Tull, M. T., Edmonds, K. A., Scamaldo, K. M., Richmond, J. R., Rose, J. P., & Gratz, K. L. (2020). Psychological outcomes associated with stay-at-home orders and the perceived impact of COVID-19 on daily life. *Psychiatry research*, *289*, 113098.

Özdin, S., & Bayrak Özdin, Ş. (2020). Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. *The International journal of social psychiatry*, *66*(5), 504–511. https://doi.org/10.1177/0020764020927051

Vîslă, A., Flückiger, C., Grosse Holtforth, M., & David, D. (2016). Irrational beliefs and psychological distress: A meta-analysis. *Psychotherapy and Psychosomatics, 85*(1), 8–15.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International journal of environmental research and public health*, *17*(5), 1729.

Wu, B. (2020). Social isolation and loneliness among older adults in the context of COVID-19: a global challenge. *Global health research and policy*, *5*(1), 1-3.

Zacher, H., & Rudolph, C. W. (2021). Individual differences and changes in subjective wellbeing during the early stages of the COVID-19 pandemic. *American Psychologist, 76*(1), 50-62. http://dx.doi.org/10.1037/amp0000702

Zhang, C.-Q., Si, G., Chung, P.-K., & Bu, D. (2017). *A three-stage adversity coping model for Chinese athletes. Journal of Sport Psychology in Action, 8(2), 87–95.* doi:10.1080/21520704.2017.1287143

STUDIA UBB PSYCHOL.-PAED., LXVII, 2, 2022, p. 89-98
(Recommended Citation)
DOI:10.24193/subbpsyped.2022.2.04

Opinion Article

CONCEPTS IN PSYCHOLOGY AND THE NEED TO CRITICALLY REFLECT ON THEM

Thea IONESCU[1]

ABSTRACT. This opinion article raises the issue of conceptual crisis in psychology, i.e. the problem of having several meanings underlying many of the concepts we study. After exemplifying with the concepts of "flexibility" and "cognition", I propose three avenues on the way to conceptual clarity, and stress the need for a stronger theoretical psychology.

Keywords: concepts in psychology, cognition, flexibility.

1. Introduction

Why should we be concerned with conceptual clarity in psychology? One answer is that working with "coherent sets of concepts" (Overton, 2015, p. 10) is believed to be fundamental for the advancement of any science. Another one can refer to the efficiency of interventions based on agreed-upon concepts. In this essay, I will tackle this issue, because in current psychology we might envisage a conceptual crisis, not only a reproducibility crisis, i.e. a major problem with the concepts we study due to the many conceptualizations one and the same construct has. The aims are to invite the readers to critically reflect on this issue, and to underline the need of a stronger theoretical psychology.

[1] Faculty of Psychology and Educational Sciences, Department of Psychology, Babeş-Bolyai University, Cluj-Napoca, Romania, theaionescu@psychology.ro

The concepts psychologists study are not clear. As Hunt (2007, p. 765) aptly asserted, "In psychology nothing is simple, nothing is clear; the field nicely mirrors the untidy, complex human mind that it studies." Let us imagine another science and its current state. If a biologist examines heart cells and liver cells, does he study the same thing? One could argue that no, because heart and liver cells have specificities that make them different. However, we can argue for the affirmative answer too, because cells are agreed-upon entities in biology. It is this latter aspect that we need to achieve in psychology too: to agree on processes, mechanisms and the like, which then can manifest themselves differently in different contexts.

The present essay will start with two concepts as examples and pinpoint the diverse meanings they currently have. Then I argue for the need for shared ground in psychology, so that researchers can agree on models that will offer the consistency required to build solid interventions (for development, optimization or interventions). Three avenues are proposed for achieving conceptual clarity. In the end, critical analysis is stressed as an optimal way to help our science mature.

2. The lack of conceptual clarity: two examples

I will illustrate what I call the conceptual crisis in psychology with two important concepts. The first one is *flexibility,* highly praised as a unique human quality (Kraft, Rademacher, Eckart, & Fiebach, 2020). When looking for a paradigm to study flexibility, one can find at least four of them: flexibility as the ability to shift (Chan, Shum, Toulopoulou, & Chen, 2008; Cragg & Chevalier, 2012; Diamond, 2006); flexibility as a measure in creativity tests (Dietrich & Kanso, 2010); flexibility as a part of the trait "openness to experience"(Chung, Su, & Su, 2012; Kalbitzer et al., 2009); and flexibility as a property, either of various processes or a general one (Hollenstein, 2015; T. Ionescu, 2007, 2012; Naigles, Hoff, & Vear, 2009). Several expressions are used interchangeably, like flexibility, cognitive flexibility, and psychological flexibility, or subtypes are derived based on different measures, like cognitive flexibility, affective flexibility, and cognitive affective flexibility.

The most common synonym in the literature for cognitive flexibility is shifting, a well-known executive function (Diamond, 2006). In this approach, some authors present shifting and cognitive flexibility as being the same ability, namely the ability to switch from one task to another or from one rule to another (Cragg & Chevalier, 2012; Garcia & Dick, 2013; van Holstein et al., 2011). While this seems at first sight adequate, when searching deeper for what does it mean

to flexibly solve a problem or to create in a domain, reality bites: the ability to switch is not enough by itself. One needs to reconfigure the background knowledge for the problem, then to identify new solutions, and only after that to maybe switch back and forth from one solution to another, until the right solution is found. So we may speak about flexibility being a property of the solver at a certain developmental phase in certain contexts (T. Ionescu, 2012, 2017a). And the "cognitive" from "cognitive flexibility" can refer to language being flexible or attention being flexible or memory being flexible and so on, because they are all cognitive processes, aren't they? When one equates cognitive flexibility with shifting it may seem that the flexibility of language for example is not also cognitive flexibility.

To complicate things even further, another problem that remains is: do we equate cognitive flexibility to psychological flexibility? When turning to personality and psychotherapy studies or to studies on creativity, we find "psychological flexibility" or "flexibility" (Levin, Haeger, Pierce, & Cruz, 2017; Kalbitzer et al., 2009; Kleibeuker, De Dreu, & Crone, 2013). In the analysis of cultural dimensions we recently find flexibility versus monumentalism, where flexibility refers to the willingness to adapt to others and learn from them, keeping a low profile, and attempting to solve personal issues by yourself (Minkov, & Kaasa, 2021). Are these the same with cognitive flexibility? Why shouldn't they be? The cognitive component is a psychological one, so cognitive flexibility is psychological flexibility. So maybe we should only use the term "flexibility" for all. For sure, for the time being, they are not investigated in the same way (i.e. cognitive flexibility as shifting and psychological flexibility as personal adaptability), and more importantly the measures consisting in tasks and in self-reports do not correlate at all (Howlett et al., 2022).

One remains easily puzzled by such diversity. Is there a "true" flexibility? Which one should we consider synonym with which and which one as different? Most educators want to develop flexibility in children, but what is it that we should develop? And most therapists want to develop flexibility in their clients' world views, but what does this mean? Also organizations would love to have flexible team members, but again who is the flexible individual?

The second concept for illustration is *cognition*, a crucial one because it is the object of focus in cognitive psychology. Recent hot debates in cognitive psychology have revolved around the question of how to conceptualize it: Is it a separate "entity," independent of the sensorimotor system, feelings, and context (as in classic cognitive psychology, Pylyshyn, 1980; Wilson, 2002) or is it dependent in any moment on the complex interactions of the sensorimotor system in the brain with the states of the body and with the surroundings (as in the embodied/grounded cognition approach, Barsalou, 2003, 2008a, 2020).

Different meanings and research programs arise based on each of these approaches. For example, in the cognitive paradigm, representations separate themselves from the sensorimotor system that brought the information in the mind and have independent existence. Grounded cognition has a different view, namely, one in which representations stay multimodal (Barsalou, 2017; Gallese & Lakoff, 2005). In other words, instead of being independent of the brain's modalities once they are formed, they are simulations of the initial learning situation in the same brain networks (Barsalou, 2008b).

An agreed-upon conceptualization is highly desirable especially because it is about the core element of contemporary psychology. Do we investigate cognition separately or in constant relationship with many non-cognitive elements? Do we build models that separate every mechanisms and process or models that look at interactions? Do we continue to teach children only "cognitively" or do we teach the cognitive via several non-cognitive means (Ionescu and Vasc, 2014; Ionescu and Glava, 2015). And do we address cognition and emotions separately in therapy and for organizational performance or do we look at these in tandem?

Examples for the lack of conceptual clarity can continue with many concepts. In a recent paper, Simonton (2016) stated that the study of creativity cannot be rigorous if there is no precise definition of it. One main issue in the investigation of creativity is that some define it by the processes it entails while others refer to it by its products (Chermahini & Hommel, 2010) and this has led to disagreement about how to measure it, too. Having multiple theories about creativity (Dietrich & Kanso, 2010) makes it difficult to know the best approach to studying it. Another example is giftedness: several authors point to the need of changing the paradigm for its study (T. Ionescu, 2014; Subotnik et al., 2011; Ziegler, Stoeger, & Vialle, 2012). For the moment, the definition of giftedness is mainly descriptive, and oftentimes left at the latitude of the selecting board based on the specific abilities the school measure (Robinson & Clinkenbeard, 2008). As a consequence programs designed to foster giftedness are very often inefficient. And if we think about attention and its role in problem solving, skill development or emotion regulation, how are we able to develop good attentional abilities for example in children, if the questions that still puzzles us about attention look like these: "If attention participates in all those functions, is it separate from each or is it an integral part of them? Or is attention epiphenomenal? Alternatively, if attention is not a single entity with a single definition, is it not an ill-conceived concept?" (Parasuraman, 2000, p. 3).

Thus it becomes obvious why conceptual clarity is at stake: With no common views about many of the fundamental concepts in the field, how can we design efficient measures and interventions in schools, clinical or organizational settings?

3. The road forward

Such great heterogeneity in the conceptualization of many notions in psychology is hindering thorough investigation: what method to use for what conceptualization. Moreover, and maybe more importantly, it also hinders the development of sound psychological applications: what to develop or what to optimize if we have 5 conceptualizations for one process. For the moment, psychology seems to be stuck in having several meanings under the same name (Ansarinia, Schrater, & Cardoso-Leite, 2022; T. Ionescu, 2012). This begs the question: how to move further?

As a first avenue, I suggest that theoretical psychology should become stronger (T. Ionescu, 2017). Unlike biology or physics, to my knowledge theoretical psychology as a field of psychology is very rare if not totally absent. In other words there are not groups of researchers who focus on concepts and their investigation across sub-domains. I do not refer to researchers who before experimentation perform their search for the concept of interest and write very nice and useful theoretical reviews. I am also not referring to only teaching students to analyze concepts (Bringmann et al., 2022), but to having research groups turning to the difficult task of clarifying concepts in our science.

The theoretical analysis may include for instance linguistic analysis, as some of the terms seem to have different meanings historically than in the current psychological scientific literature. For example, "flexibility" comes from the Latin *flecto*, which means to bend, turn, or curve (V. Ionescu, 1993). These meanings have little to do with the number of ideas that can be generated by a person or with shifting from one rule to another, the approaches we saw above. It is interesting to reflect thus on what it means to be flexible: it may perhaps mean that individuals become capable of bending or twisting their knowledge about the problem or about the strategies to be used for arriving at a new solution. In this possible scenario, flexibility is not just about changing viewpoints, which relies heavily on shifting as the mechanism that changes the focus attention on different elements of knowledge, but it may be about turning the same knowledge over and over until a new use for it is found. As such, twisting may require stable knowledge before entering the stage in problem solving (T. Ionescu, 2017a, 2019). It may also be the case that it is automatic after expertise is aquired. Twisting can thus prove to be a new interesting mechanism for reaching flexible outcomes.

A similar search leads us to interesting insights about representation. It comes from the Latin *repraesento*, meaning to display, depict, or revive (V. Ionescu, 1993). Interestingly, these meanings are closer to the grounded cognition approach (i.e., reactivating the same sensorimotor states of the brain

as those that were activated when a person first learned about a concept, Barsalou, 2003, akin to a re-presentation, a repetition of the first presentation). The puzzling question is how did the concept of representation in classic cognitive psychology come to mean something that is not linked to sensorimotor elements at all (especially in the case of abstract representations). Because vocabulary matters (Overton, 2015), we can speculate that all of these changes in meaning contribute fundamentally to the lack of clarity in psychology today. Theoretical analysis could shed light on changes in meaning, on how models were developed, and lead to agreed-upon, unitary models.

A second important avenue is methodological. Comparing directly current methodological approaches of one and the same concept could shed light on commonalities and differences among these. Some recent comparisons for cognitive flexibility have found that on the one hand, measures based on tasks do not correlate with measures based on self-report, even if both are intended to measure the same construct (Howlett et al., 2022). On the other hand, measures that vary the type of stimuli such as neutral versus emotional stimuli in the task-switching paradigm measure the same underlying mechanism (Kraft et al., 2020); as a consequence maybe we should not give different names to these, like cognitive flexibility and affective flexibility. Moreover, children are being flexible in one kind of task (flexible categorization task) but not in another (set-shifting task) at the same age, hinting to the fact that the task context may in fact add to the manifestation of flexibility (Ionescu, 2017b). With regard to cognition, deciding whether cognition is independent or dependent on non-cognitive aspects is vital, and the distinction cognitive flexibility vs. affective flexibility would naturally vanish if cognition and emotions will prove not to be separable entities (Damasio, 2018).

Furthermore, if we conceive the human psychological system as a dynamic system, then we should abide by the assumption that it is the relations among parts that matter most (von Bertalanffy, 1972). As a consequence we should devise new measures to investigate cognition as a result of multiple interactions at multiple time scales (Smith & Thelen, 2003) or flexibility as a property that results from the interplay of multiple mechanisms (Ionescu, 2012). While this is not an easy task, devising new methods may be imperative if we want to move forward as a field. It may well be that machine learning as a new tool will help a lot (Ansarinia et al., 2022), but I think that the human mind is still best suited to tackle the two avenues described above, and that we should teach young researchers that it is a rewarding career path.

A third avenue is the feedback from practitioners. Once a model is in place and a test or an intervention is developed, practitioners should be bolder in signaling when these do not work in practice, when change is not as desired

so that researchers can work on improvements. Moreover, practitioners have the advantage of taking the pulse directly when implementing an intervention, of knowing the specific context in which it is implemented, and of being able to perform thorough observations. These in return would inform the available models and measures, and offer important clues for what to keep, what to change, and what to abandon.

4. Concluding remarks

Experimentation is vital in science, but so is conceptual work (Overton, 2015). It is my belief that by having a coherent set of concepts, psychologists can also change the way the field is moving forward. Conceptual clarity is leading to methodological advances and then to better suited applications. One could say that we are in a normal phase in our science's development: as a young science, we do not know yet what some concepts are exactly and this is why we have to investigate them further. This is absolutely true. However, I argue that based on the years of experimentation there are already in place, we can begin to eliminate some of the paradigms and to change others a 180 degrees. If not, psychology will continue with parallel conceptualizations and the conceptual crisis will grow deeper feeding further the "theory crisis" (Eronen, & Bringmann, 2021).

Jerome Bruner said that "any story we tell about human infancy grows as much out of ideological convictions and cultural beliefs as out of observations" (Bruner 1986 in Glăveanu, 2011, p. 123). This may be true about everything we investigate in psychology. And it may well be the time to mature as a science and to agree on both our convictions and our observations. And what a categorization and language researcher once said, that "it may not be clear where research on categorization is going, but it *is* moving, and that is good" (Smith, 2005, p. 170) can be extrapolated to the whole field of psychology: One may not be sure where it is heading, but for sure it is awaiting some important changes, and this is very exciting, not least because of the tremendous implications it can have for the betterment of humanity. The time may be ripe for deep critical reflection in our field as this can only facilitate positive change.

REFERENCES

Aldao, A., Sheppes, G., & Gross, J. J. (2015). Emotion regulation flexibility. *Cognitive Therapy and Research*, *39*(3), 263-278.

Ansarinia, M., Schrater, P., & Cardoso-Leite, P. (2022). Linking Theories and Methods in Cognitive Sciences via Joint Embedding of the Scientific Literature: The Example of Cognitive Control. *arXiv preprint arXiv:2203.11016*.

Barsalou, L.W. (*2003).* Situated simulation in the human conceptual system. *Language and Cognitive Processes, 18,* 513-562.

Barsalou, L. W. (2008a). Grounded Cognition*, Annual Review of Psychology, 59,* 617-645.

Barsalou, L. W. (2008b). Grounding Symbolic Operations in the Brain's Modal Systems. In G. R. Semin & E. R. Smith (Eds.), *Embodied Grounding - Social, Cognitive, Affective, and Neuroscientific Approaches.* Cambridge University Press.

Barsalou, L. W. (2017). Cognitively Plausible Theories of Concept Composition. In J.A. Hampton & Y. Winter. (Eds.), *Compositionality and Concpets in Linguistics and Psychology,* Language, Cognition, and Mind 3, (pp. 9-30). Springer, Cham.

Bringmann, L. F., Elmer, T., & Eronen, M. I. (2022). Back to basics: The importance of conceptual clarification in psychological science. *Current Directions in Psychological Science*, *31*(4), 340-346.

Chan, R. C., Shum, D., Toulopoulou, T., & Chen, E. Y. (2008). Assessment of executive functions: Review of instruments and identification of critical issues. *Archives of Clinical Neuropsychology*, *23*, 201-216.

Chermahini, S. A., & Hommel, B. (2010). The (b) link between creativity and dopamine: spontaneous eye blink rates predict and dissociate divergent and convergent thinking. *Cognition*, *115*(3), 458-465.

Chung, S. H., Su, Y. F., & Su, S. W. (2012). The impact of cognitive flexibility on resistance to organizational change. *Social Behavior and Personality: an international journal*, *40*(5), 735-745.

Cragg, L., & Chevalier, N. (2012). The processes underlying flexibility in childhood. *Quarterly Journal of Experimental Psychology*, *65*, 209-232.

Diamond, A. (2006). The early development of executive functions. In E. Bialystok & F. I. M. Craik (Eds.), *Lifespan cognition: Mechanisms of change* (pp. 70-95). New York, NY: Oxford University Press.

Dietrich, A., & Kanso, R. (2010). A review of EEG, ERP, and neuroimaging studies of creativity and insight. *Psychological Bulletin, 136,* 822–848.

Eronen, M. I., & Bringmann, L. F. (2021). The theory crisis in psychology: How to move forward. *Perspectives on Psychological Science*, *16*(4), 779-788.

Gallese, V., & Lakoff, G. (2005). The brain's concepts: The role of the sensory-motor system in conceptual knowledge. *Cognitive neuropsychology*, *22*(3-4), 455-479.

Glăveanu, V. P. (2011). Children and creativity: A most (un) likely pair?. *Thinking skills and creativity*, *6*(2), 122-131.

Hollenstein, T. (2015). This time, it's real: Affective flexibility, time scales, feedback loops, and the regulation of emotion. *Emotion Review*, *7*, 308-315.

Hunt, M. (2007). *The Story of Psychology.* Anchor Books, NY.

Ionescu, T. (2007). "I can put it there too!" - Flexible object categorization in preschool children and the factors that can act upon it. *Cognitie, Creier, Comportament/ Cognition, Brain, Behavior*, *11,* 809-829.

Ionescu, T. (2012). Exploring the nature of cognitive flexibility. *New Ideas in Psychology*, *30*, 190-200.

Ionescu, T. (2014). *Copiii altfel - Trasee specifice de dezvoltare cognitivă: O analiză critică.* Presa Universitară Clujeană.

Ionescu, T. (2017a). The Variability-Stability-Flexibility Pattern: A Possible Key to Understanding the Flexibility of the Human Mind. *Review of General Psychology, 21,* 123-131.

Ionescu, T. (2017b). When children succeed in chamging their responses: Insights from three versions of a flexible categorization task. *European Journal of Developmental Psychology,* DOI: 10.1080/17405629.2017.1333957.

Ionescu, T. (2017c). When Is a Cognitive System Flexible? The Variability-Stability-Flexibility Pattern on the Way to Novel Solutions. *Avant, VIII,* Special Issue, 253-259.

Ionescu, T., & Vasc, D. (2014). Embodied cognition: Challenges for psychology and education. *Procedia - Social and Behavioral Sciences, 128,* 275-280.

Ionescu, T., & Glava, A. (2015). Embodied learning: Connecting psychology, education, and the world. *Studia UBB Psychol.-Paed., LX,* 2, 5-17.

Ionescu, V. (1993). *Dicționar latin-român*. Ed. Orizonturi.

Kalbitzer, J., Frokjaer, V. G., Erritzoe, D., Svarer, C., Cumming, P., Nielsen, F. Å., ... Kringelbach, M. L. (2009). The personality trait openness is related to cerebral 5-HTT levels. *Neuroimage*, *45*, 280-285.

Kleibeuker, S. W., De Dreu, C. K., & Crone, E. A. (2013). The development of creative cognition across adolescence: distinct trajectories for insight and divergent thinking. *Developmental science*, *16*(1), 2-12.

Levin, M. E., Haeger, J., Pierce, B., & Cruz, R. A. (2017). Evaluating an adjunctive mobile app to enhance psychological flexibility in acceptance and commitment therapy. *Behavior Modification*, *41*(6), 846-867.

Naigles, L. R., Hoff, E., & Vear, D. (2009). Flexibility in early verb use: Evidence from a multiple-n diary study. *Monographs of the Society for Research in Child Development, 74*(2), Serial No. 293.

Overton, W. E. (2015). Process and Relational-Developmental Systems. In R. M. Lerner (Series Ed.), *Handbook of child psychology and developmental science,* (pp. 9–62). Hoboken, NJ.

Parasuraman, R. (2000). The Attentive Brain: Issues and Prospects. In R. Parasuraman (Ed.), *The Attentive Brain*, MIT Press.

Pylyshyn, Z. W. (1980). Computation and cognition: issues in the foundations of cognitive science. *The Behavioral and Brain Sciences, 3,* 111-169.

Simonton, D. K. (2016). Creativity, Automaticity, Irrationality, Fortuity, Fantasy, and Other Contingencies: An Eightfold Response Typology. *Review of General Psychology, 20,* 194-204.

Smith, L. B. (2005). Emerging Ideas About Categories. In L. Gershkoff-Stowe & D. H. Rakison (Eds.), *Buiding Object Categories in Developmental Time,* (pp. 159-173), Lawrence Erlbaum Associates, Inc., NJ.

Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review*, *9*,625-636.

Ziegler, A., Stoeger, H., & Vialle, W. (2012). Giftedness and gifted education: The need for a paradigm change. *Gifted Child Quarterly*, *56*, 194-197.

STUDIA UBB PSYCHOL.-PAED., LXVII, 2, 2022, p. 99-106
(Recommended Citation)
DOI:10.24193/subbpsyped.2022.2.05

RESPECT FOR RESOURCES OR TOWARDS A NEW PARADIGM IN EDUCATION IN ROMANIA

Cornel COSTEA[1]

ABSTRACT. In a world dominated, on the one hand, by the polysemantism of the notion of crisis, and on the other, by the irrational consumption of resources, in the frantic rush for material well-being, the introduction in some schools in Romania and the Republic of Moldova of the optional course *Respect for resources* aims to break new ground in the awareness of the role of sustainable development, both for current and future generations. From one year to the next, the propagation, among young people, of the 17 objectives of sustainable development (OSDs), will, in the long term, have a major influence in the transformation of mentalities at society level, going, this time, from the educable to the other age groups (adults and the elderly, respectively). The present study aims to highlight, in a critical but constructive manner, the steps followed in the establishment of this new integrated discipline, the specific competencies and operational objectives, the organization of the contents and their relevance, the growing impact on school communities in our country and the perspectives of implementation at school unit level in Romania and the Republic of Moldova. The success of the project depends, to an overwhelming extent, on the teacher's awareness and knowledge to convince the decision-making factors of the school of the need to integrate such an optional course in the School Decision Curriculum or in the Local Development Curriculum, both at secondary school and at high school level.

Keywords: crisis, school decision curriculum, sustainable development, respect, resources, sustainability.

[1] Faculty of Psychology and Educational Sciences, Babeş-Bolyai University Cluj-Napoca, Romania, cornel.costea@ubbcluj.ro

ZUSAMMENFASSUNG. In einer Welt, die einerseits vom polysemantischen Begriff der *Krise* und andererseits vom irrationalen Verbrauch von Ressourcen im rasenden Streben nach materiellem Reichtum beherrscht wird, soll die Einführung des fakultativen Unterrichtsfachs *Respekt vor den Ressourcen* an einigen Schulen in Rumänien und der Republik Moldau neue Wege im Hinblick auf die Sensibilisierung für die Rolle der nachhaltigen Entwicklung sowohl für die heutigen als auch für die künftigen Generationen eröffnen. Die Verbreitung der 17 Ziele für nachhaltige Entwicklung (Ziele für nachhaltige Entwicklung - Sustainable Development Goals, SDGs) unter jungen Menschen wird langfristig einen großen Einfluss auf den Mentalitätswandel in der gesamten Gesellschaft haben, dieses Mal von den Gebildeten zu den anderen Altersgruppen (Erwachsene, bzw. ältere Menschen). Die vorliegende Studie soll - manchmal auf kritische, aber konstruktive Weise - die Schritte aufzeigen, die bei der Einführung dieses neuen integrierten Fachs unternommen wurden, die spezifischen Kompetenzen und operativen Ziele, die Organisation der Inhalte und ihre Relevanz, die zunehmende Auswirkung auf die Schulgemeinschaften in unserem Land und die Aussichten auf eine Umsetzung in möglichst vielen Schulen in Rumänien und der Republik Moldau. Der Erfolg des Projekts hängt in hohem Maße von dem Bewusstsein und den Kenntnissen der Lehrkraft ab, der die Entscheidungsträger der Schule von der Notwendigkeit der Integration eines solchen Wahlfachs in den Lehrplan auf der Grundlage eines Schulbeschlusses oder in den Lehrplan für die lokale Entwicklung sowohl in der Sekundarstufe als auch in der Oberstufe überzeugen muss.

Stichworte: Krise, Lehrplan durch Schulentscheidung, nachhaltige Entwicklung, Respekt, Ressourcen, Nachhaltigkeit.

1. Introduction

In the history of humanity, periods of crisis were good opportunities to act. Intelligent actions, based on understanding the causes and the regional and global context of manifestation, ensured the resilience of the social system, in particular, but also of the geosystem, as a whole. In the face of the major changes taking place at planetary level, the most appropriate strategy is that of sustainable development, realized and applied, day by day, by as many citizens as possible, responsible not only for their own destiny, but also for the entire planet. Now is a good time for creating a better world. Schools represent the ideal environment where young people can understand the problems that humanity is facing (*climate change*, *food waste*, *waste management*, *consumption behaviours* etc.).

They, along with their mentors, can find viable solutions to these issues, applicable both in the short term as well as in the medium and long term.

2. The genesis of ideas

In order not to remain a form without a foundation, the concept of sustainability, beyond the need to be known and understood at community level, needs a wider and permanent framework for implementation, and this could be identified, initially, at pre-university educational institution level in our country and in schools in the Republic of Moldova.

The optional course Respect for resources was created by two NGOs from Cluj: Food Waste Combat and Clujul Sustenabil, being supported by Raiffeisen Bank, as the main sponsor, and by LIDL Romania (https://foodwastecombat.com/proiecte/).

Since the team involved in the development of the *Respect for resources* project was not a large one, thus being unable to support trainings in all schools in Romania, what seemed as the best course of action was the creation of an educational guide, which could have a major impact in the long-term by providing quality information both to students and parents, as well as to teachers and other people interested in ecological issues.

Also, the textbook can be a credible and accessible source for the development of desirable skills, attitudes and behaviors in a society still focused on the excessive and irrational consumption of resources. In this sense, activities such as: *soil health and compost*, *practicing a new consumption habit for students to practice for 21 days*, *reducing food waste*, *the selective waste collection guide*, *the ecological footprint of food*, *fast fashion or slow fashion* etc.

3. The materialization of the project and the impact on school communities in our country and in the Republic of Moldova

The Cluj Regional Food Bank Association entered the *Respect for resources* project in September 2020 in the Raiffeisen Communities funding competition, in which over 100 projects participated. Of these, only 11 were winners, including *Respect for resources*, thus increasing the chances that the project will materialize and reach as many students as possible. Both organizations aimed to create a framework for non-formal education, and the jury appreciated, in particular, the social impact that this project can have at the level of each community, not only by caring for the environment, but also by developing skills which aim both

to preserve and value resources and to acquire the status of an active citizen (https://ambasadasustenabilitatii.ro/respect-pentru-resurse-despre-materia-care-schimba-relatia-elevilor-cu-sustenabilitatea/).

The 2021-2022 school year marks a first in Romanian pre-university education, with 400 students from 5 towns in our country being the direct beneficiaries of the *Respect for resources project*, under the guidance of ten teaching staff. Of these, 3 taught the optional course in the form of the School Decision Curriculum (SDC), and 7 included different topics of the optional course in the leadership classes.

Compared to the previous school year, in 2022-2023, the number of students studying, fully or partially, the contents of the optional *Respect for resources* course increased almost 3 times, reaching over 1100. Also, the number of towns in the schools to which this optional has reached is currently 17, both from Romania and from the Republic of Moldova. With regard to the number of teachers involved, this too experienced an increase of almost 3 times, out of the 29, 13 teaching the optional, this school year, in the form of the School Decision Curriculum or the Local Development Curriculum (LDC).

To the extent that the pace of implementation of the respective project will be maintained, at least at the current level, it can be estimated that, in the next 3 years, *Respect for resources* will be present in over 450 towns/villages in our country and in the Republic of Moldova, involving over 29,000 students and almost 800 teachers (**Table 1**).

Table 1. Evolution and prognosis for 2021-2026

School year	Number of towns/villages	Number of students	Number of teachers
2021-2022	5	400	10
2022-2023	17	1100	29
2025-2026*	469	29 700	783

Source (for 2021-2022 and 2022-2023): -Georgescu, A. – RPR - respect pentru resurse <respectpentruresurse@gmail.com>

4. Specific competencies and operational objectives

According to *The Guidelines for Developing, Updating and Assessing the National Curriculum* competencies are organized sets of knowledge and skills acquired through learning, allowing the identification and solving in various contexts of problems specific to a sphere of interest (https://www.edu.ro/sites/default/files/DPC_31.10.19_consultare.pdf).

For the *Respect for resources* optional course, no general competences have been established, but only specific competences, as the contents are to be presented at the level of a single year of study, although they could be organized and reorganized, so that they can be adapted, gradually, from the 5th grade to the 12th grade. Therefore, we consider it absolutely necessary to establish the general competences from which the specific competences can later be derived.

The authors of the *Respect for resources* optional course with the subtitle: *A different education for sustainability guide*, structured the specific competences by referring to the four components of the cognitive and socio-emotional development of students: knowledge/information (*What should they know?*), skills (*What should they be able to do?*), attitudes (*How should they feel?*) and behaviors (*How should they behave? / What habits to have?*), correlating them with the operational objectives circumscribed to each lesson. Unfortunately, their wording and content are sometimes inaccurate, as they do not express observable and measurable behaviors (examples from the Teacher's Guide, Călin, D., Ciobanu, N., Georgescu, A., Gui, C., Moldovan, C., & Perneș, I., 2021b: *to have knowledge about the different types of climate*, *to know what the water cycle is in nature*, *to know how humanity uses resources of water*, *value water consumption* etc.). It is necessary to radically revise them, at the level of each lesson, to be truly useful in the evaluative strategies chosen by the teachers who teach this optional.

In other words, the operational objectives aim at a qualitative change, and not just a quantitative one, embodied in the student's ability to prove that he or she has learned a new logical operation, a new concept or another learning algorithm. Also, the operational objectives must contain the observable behavior, specified by an active verb, that targets the learning outcomes (*What?*), the level of performance considered sufficient for the student to demonstrate the observable behavior (*How much?*), as well as the conditions under which the behavior can be demonstrated (*How?*). On the other hand, the operational objectives in the affective sphere cannot be expressed, most of them, in operational terms, not allowing the measurement of performance after a learning situation (examples from the Teacher's Guide, Călin, D., Ciobanu, N., Georgescu, A., Gui, C., Moldovan, C., & Perneș, I., 2021b: *to feel intrigued by the complexity of the factors that influence the carbon cycle*, *to want to know more about air quality*, *be surprised by the properties of methane and the contribution to the greenhouse effect* etc.).

5. The contents of the optional course

The *Respect for resources* optional course is organized into: 7 chapters, 28 lessons and 6 assessments, being designed in such a way that experiential learning constitutes the framework for carrying out the teaching-learning-assessment activity. The concrete experience thus represents the starting point in the exploration of new contents, followed by observations and reflections on the evoked experience, the formation of new concepts, based on the observations and reflections previously analyzed, and the last stage is the testing of the new concepts, through the transfer and their application (a new action plan). In detail, the structure of the optional course is as follows (**Table 2**):

Table 2. The contents of the optional course

Chapters	Lessons	Assessments
1. The planet and about sustainable development	Introduction to caring for our natural resources	
	Sustainability and sustainable development	
	Climate	
2. Air and water – vital elements	The carbon cycle – a deregulated natural process	
	The carbon cycle – how we restore the balance	
	The methane cycle	
	The water cycle in nature	
	The planet's water resources	
3. The riches of nature	Soil – Black gold	*1. The objectives of sustainable development (OSDs) on our street*
	Soil health and compost	
	Soil biodiversity	
	Aquatic and terrestrial biodiversity	
	Ecosystems in the service of humanity	
4. How do we protect what we have?	Dependence of human society on the environment	*2. All stages count!*
	Migration of populations	
	The air pollution	
	Water pollution	
	Soil pollution	
	Biodiversity reduction – Anthropogenic impact	
	Biodiversity reduction – The impact of climate change	
5. A new balance	Degradation of the natural environment and human health	*3. Fast fashion or slow fashion?*
	Dependence of the economy on the environment	
	How we reduce waste	
	Food waste	
	The ecological footprint of food	

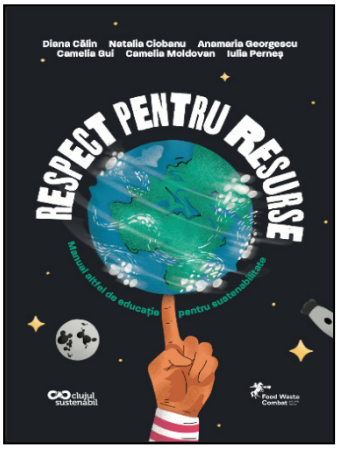
Chapters	Lessons	Assessments
6. Hello? The human-nature connection	The economy of the future, the economy of systemic balance	
	12 characters at the dawn of the Climate Crisis	
	Urban gardening or indoor gardening?	
7. Experience-Learning		*4. With the documentary in the analysis*
		5. A picture of sustainability
		6. Letter to you

Source:-Călin, D., Ciobanu, N., Georgescu, A., Gui, C., Moldovan, C., & Perneș, I. (2021a)

It can be observed that the teaching of the contents calls for an interdisciplinary approach, the sphere of geography frequently interfering with biology, ecology, economics and chemistry. Since the optional is offered from the 5th to the 12th grade, we believe that a rethinking of the organization of the contents would be welcome for the following years, so that there is a correlation between them and the cognitive and procedural acquisitions from the compulsory subjects.

6. Conclusions

The *Respect for resources* optional, to which more than 1100 students from 17 towns and villages in Romania and the Republic of Moldova have access in the 2022-2023 school year, under the guidance of 29 teachers, aims at both the interdisciplinary approach to the contents and the stimulation of curiosity, of critical and lateral thinking, but also of collaborative activities among students. At the same time, it is a pioneering activity regarding the introduction into the school curriculum in Romania and the Republic of Moldova of the notion of sustainability, associated with that of sustainable development (already present in the contents of the 10th and 11th grades from the Geography discipline in Romanian education).



In other words, the course is a source of information and education for the public interested in new concepts and actions related to

the management of resources and the increasingly complex interactions between the environment, economy and society.

Equally, it is part of the trend of a transdisciplinary approach to the ecological perspective in education observed at a global level, the activities within the school can be correlated and supplemented with extracurricular activities and thematic camps, with the declared aim not only to understand the concept of sustainable development, but also the application of the principles that govern sustainability, as Camelia Moldovan, the project coordinator, claims: *The RPR (Respect for resources*) *Manual creates a space for discussion and reflection on how we relate to nature's resources and our actions. I believe that this space is vital to be part of the education system, because these educational discussions have the power to produce a paradigm shift. One to remind us how important our relationship with nature is and to invest more in it* (https://ziarulfaclia.ro/respect-pentru-resurse-manual-de-educatie-pentru-sustenabilitate-realizat-de-doua-ong-uri-clujene/).

REFERENCES

Călin, D., Ciobanu, N., Georgescu, A., Gui, C., Moldovan, C., & Perneş, I. (2021a). *Respect for resources – Alternative education manual for sustainability*, Edit. Seneca Lucius Annaeus. (Romanian language)

Călin, D., Ciobanu, N., Georgescu, A., Gui, C., Moldovan, C., & Perneş, I. (2021b). *Respect for resources – Other Sustainability Education Manual, Teacher's Guide*, Daisler Print House (Romanian language)

https://ambasadasustenabilitatii.ro/respect-pentru-resurse-despre-materia-care-schimba-relatia-elevilor-cu-sustenabilitatea/

https://www.edu.ro/sites/default/files/DPC_31.10.19_consultare.pdf

https://foodwastecombat.com/proiecte/

https://www.goodreads.com/book/show/59463963-manual-respect-pentru-resurse

https://ziarulfaclia.ro/respect-pentru-resurse-manual-de-educatie-pentru-sustenabilitate-realizat-de-doua-ong-uri-clujene/

RPR- respect pentru resurse <respectpentruresurse@gmail.com>

STUDIA UBB PSYCHOL.-PAED., LXVII, 2, 2022, p. 107-138
(Recommended Citation)
DOI:10.24193/subbpsyped.2022.2.06

EXPLORING THE DEVELOPMENT OF PROCEDURAL KNOWLEDGE AND RELATED COMPETENCIES THROUGH STUDY OF BIOLOGY IN MIDDLE AND HIGH SCHOOLS IN ROMANIA

Miriam KENYERES[1*], Ion ALBULESCU[2], Irina POP-PĂCURAR[3]

ABSTRACT. The current educational paradigm implemented worldwide is the development of competence comprising knowledge, skills, and attitudes. This research aims to investigate the acquisition of procedural knowledge and competencies targeting this type of knowledge through the study of Biology in middle and high schools in Romania. The paper first provides a brief overview of the history and existent usage of the concepts of competence and procedural knowledge. Moreover, it describes the Romanian educational system from a diachronic perspective. Following this, a careful analysis of middle and high school Biology syllabi is conducted. Particularly, development of procedural knowledge and competencies targeting procedural knowledge in these documents is examined critically. The results of this analysis indicate that, even though syllabi mention competence and procedural knowledge, they need more concrete activity guidance and assessment to train them. Finally, an online survey targeting high school ninth-graders and first-year university students is applied and analyzed. The survey assesses the implementation of instruction based on procedural knowledge. The results reveal the need for more logistics (laboratories and instruments) provision in schools and for carrying out practical activities.

[1] PhD student, Doctoral School of Education, Reflection, Development, Department of Education Sciences, Faculty of Psychology and Educational Sciences, Babeș-Bolyai University, Cluj-Napoca, Romania
[2] Professor, PhD, Department of Education Sciences, Faculty of Psychology and Educational Sciences, Babeș-Bolyai University, Cluj-Napoca, Romania
[3] Associate Professor, PhD, Department of Science Teacher Education, Faculty of Psychology and Educational Sciences, Babeș-Bolyai University, Cluj-Napoca, Romania
* Corresponding author: miriam.kenyeres@ubbcluj.ro

A need for reconsidering Biology syllabi, educational investment, and teacher preparation is necessary to succeed in developing procedural knowledge and competencies associated with this, through the study of Biology.

Keywords: procedural knowledge, competencies, curriculum, Biology syllabus, practical activity, competency-based education, middle school, high school.

ZUSAMMENFASSUNG. Das weltweit implemmentierte pädagogische Paradigma verfolgt die Entwicklung von Kompetenzen die das Wissen und unsere Fähigkeiten und Einstellungen umfassen. Diese Recherche hat als Ziel die Erforschung der Akquisition von prozedurales Wissen und Kompetenzen die diese Wissenart zielen, durch den Biologie-Studium in der rumänischen Mittel- und Oberstufe. Die Arbeit bietet erstens eine kürze Übersicht auf der Geschichte und schon existierende Nutzung von solche Konzepten wie Kompetenz und prozedurales Wissen. Ebenso, sie beschreibt den rumänischen Bildungssystem aus einer diachronischen Perspektive. Bildung von prozedurales Wissen und Kompetenzen die prozedurales Wissen zielen sind in diesen Urkunden insbesonders kritisch untersucht. Die Ergebnisse dieser Analyse zeigen dass, obwohl Lehrpläne solche Konzepte wie Kompetenz und prozedurales Wissen erwähnen, sie mehr konkrete Aktivitäten zur Anleitung und Bewertung brauchen. Endlich, eine Online-Umfrage die die neunte Klasse und die Studenten aus den ersten Universität-Jahr zielt wird analysiert und angewendet. Die Umfrage bewertet die Implementierung der Anweisungen die auf prozedurales Wissen basiert sind. Die Ergebnisse zeigen eine Notwendigkeit für eine größere logistiche Versorgung (Labors und Instrumente) in Schulen aber auch für die Durchführung von mehreren praktische Aktivitäten. Die Notwendigkeit einer Überdenkung der Biologie-Fachlehrpläne, einer Investition in den Bildungsystem und einer verbesserten Vorbereitung des Lehrers ist wichtig um die Entwicklung von prozedurales Wissen und Kompetenzen die prozedurales Wissen zielen durch den Studium von Biologie zu ermöglichen.

Stichwörter: prozedurales Wissen, Kompetenzen, Curriculum, Biologie-Fachlerplan, praktische Aktivität, auf kompetenz-basierte Bildung, Mittelstufe, Oberstufe.

Introduction

Competency-based education (CBE) is the latest education paradigm revolutionizing educational goals. What it entails, and what it brings in addition to the traditional ones? The term competency or competence still needs clarification regarding meaning, implementation, and assessment. Some authors consider competence as an ability that allows a person to handle a specific

situation (Klieme & Leutner, 2006). Other psychological researchers (Gelman & Greeno, 1989; Greeno, Riley & Gelman, 1984; Sophian, 1997) consider that competence can be observed from three perspectives: conceptual competence, which refers to an abstract knowledge of the field; procedural competence, defined as the set of skills needed to put into practice the first type of competence and the performance one, which consists of the ability to choose the right way to solve a problem. Weinert (2001) compiled a list of elements that measure and influence a person's level of competence (a) ability, (b) knowledge, (c) understanding, (d) skill, (e) action, (f) experience, (g) motivation.

In 1996 and 1998, Cheetham and Chivers, in the context of professional skills, elaborated a holistic model that included five competencies needed by a person in the workplace. These competencies can also be transferred and analyzed through the lens of competency-based educational paradigm:

1. Cognitive competencies: include conceptual knowledge (know-that) and understanding (know-why).
2. Functional competencies: knowledge of the know-how type or skills regarding those tangible things a person must achieve in the field of work.
3. Personal competencies: of the type know how to behave.
4. Ethical competencies: possessing a value system that influences personal decisions at work.
5. Meta-competencies: the ability to react to unforeseen situations and reflect on learning.

According to the Council of the European Union recommendations, *competencies* are a set of knowledge, skills, and attitudes:

- knowledge – represents a set of factual information, concepts, ideas, and validated theories that support the understanding of a discipline or a field of knowledge;
- skills – represent the use of existing knowledge in order to achieve some results;
- attitudes – describe ways of relating to ideas, people, or situations.

Voiculescu (2011) states that competence has two interrelated internal and external factors. Internal factors consist of knowledge, skills, and attitudes. External factors comprise tasks, context, and situation (Figure 1). *Tasks* are the problems or operations a person must do to develop competencies. *Contexts* are the conditions and interactions in which an activity is carried out. *The situation* is the concrete conditions: logistics and temporospatial conditions in which a person does the task.

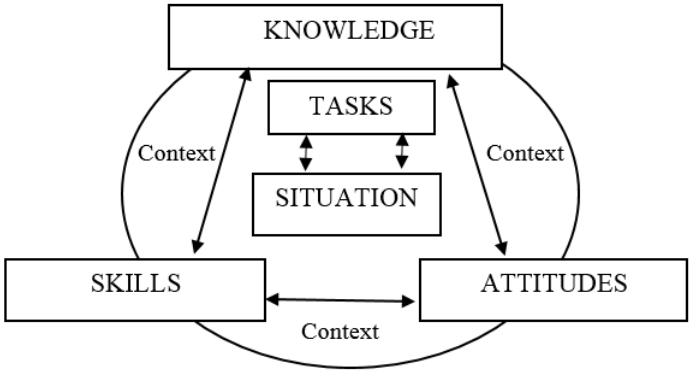


Figure 1. The integrative model of competence (Voiculescu, 2011)

According to other authors, knowledge consists of three parts: conceptual, factual, and procedural. The syllabi try to realize a concretization of the term knowledge, subsuming it under the concept of "contents", implying three distinct groups within them: factual contents, conceptual contents, and procedural contents (Mândruț et al., 2012). The French education approach offers another perspective on the type of knowledge, namely, it classifies knowledge in *savoir* (*compétences théoriques*, i.e. knowledge), *savoir-faire* (*compétences pratiques*, i.e. functional competencies) and *savoir-être* (*compétences sociales et comportementales*, i.e. behavioural competencies) (Winterton et al., 2006).

Conceptual knowledge, also referred to as declarative or propositional knowledge, is a "type of static knowledge about facts, concepts, and principles that apply within a particular domain" (De Jong & Ferguson-Hessler, 1996). It describes things, events, processes, and the relations established between them. Moreover, declarative knowledge is also called declarative memory because it refers to the information stored in the memory (Ten Berge & Van Hezewijk, 1999; Saks et al., 2021).

The main difference between conceptual and procedural knowledge is that the first involves retention and understanding of the definitions, rules, and principles in a field of study. In contrast, the second represents actions or strategies necessary to fulfill tasks or solve problems (VanScoy, 2019). The features of both types of knowledge are listed in Table 1.

In the context of the study of Biology, we will discuss competencies, specifically those targeting the development of procedural knowledge, the component "to know how to do/*savoir-faire*." This type of knowledge aims to develop to the maximum the intellectual and psychomotor capacities of students, emphasizing those of investigation and exploration of the living world. The

investigation of the living world can be done through the direct exploration of nature: observation, experiment, practical work, laboratory work, and methods of indirect exploration of nature, for example, modeling. The development of scientific knowledge/investigation in didactic practice is carried out through methods that dynamize the learning process, engaging students' skills and abilities. All the practical methods: observation, experiment, practical work, and laboratory work, have an applicative character and develop students' competencies and procedural knowledge (Bîrzan, 2010).

Table 1. Features of conceptual and procedural knowledge
(adapted after De Jong & Ferguson-Hessler, 1996; VanScoy, 2019)

Type of knowledge	Conceptual or declarative knowledge	Procedural knowledge
Features	• use of symbols and formulae → concepts and relations • state and explain characteristics, terminologies, properties, theories • verbalize principles, definitions → intuitive, tacit understanding • describe general structures of domains	• manipulation of rules/recipes/algebraic → meaningful action • use of isolated algorithms → action related to concept or principle • conscious choice and step by step execution • application of a procedure

Despite its acknowledged importance, CBE is a relatively new paradigm in Romania, implemented only after 1990 (Ardelean & Mândruț, 2012, p.11). Studies on the development of competencies targeting procedural knowledge and, implicitly, on the development of procedural knowledge through Biology are very scarce.

Aim and research questions

The purpose of this study is to explore the development of procedural knowledge and competencies comprising this type of knowledge through Biology. The addressed research questions are:

- *Do Biology syllabi engage students' competencies and procedural knowledge?*
- *How are competencies and procedural knowledge developed through the study of Biology?*

In order to assess this, a critical analysis of middle and high school Biology syllabi was conducted. Also, data were collected from ninth-grade high school and first-year university students regarding the learning strategies of Biology lessons and the exploitation of procedural knowledge.

A diachronic perspective of the educational system in Romania

The organization of the educational system in Romania has undergone numerous changes over time, influenced by various political ideologies. The educational trend of the last century, until 1950, was focused on didactic of content: knowledge achievement, without taking into account their processing in a critical form or the practical significance (Ardelean & Mândruț, 2012, p.11). After the middle of the 1950s, Bloom's cognitive verbs revolutionized the instructive-educational approach by introducing some elements of the psychology of learning and led to the emergence of didactics focused on achieving objectives (Bloom, 1956). Mager played a crucial role in this change, by introducing the concept of operationalization of objectives (Mager, 1984). After 1990, the educational goals reoriented towards developing competencies based on the idea that information processing leads to their development (Ardelean & Mândruț, 2012, p.11) (Figure 2).

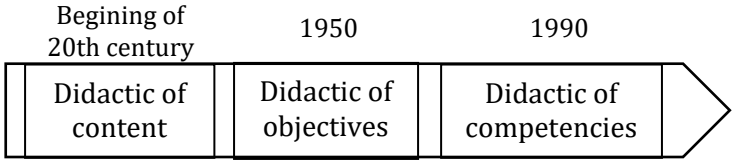


Figure 2. Timeline of the evolution of didactics in Romania

Romania's most important educational reform took place in 1994-2001, and one of its objectives was to rethink and reorganize the curriculum (Marga, 2002). In a narrow sense, the curriculum designates education content or represents the regulatory documents in which the essential data and learning experiences the school offers to the student are present: education plans and syllabi. In a broad sense, the term defines the interdependencies between educational purposes, educational content, and instructional and assessment strategies (Bocoș, 2017, p.72-73). Eliminating the excessive information from textbooks and syllabi and centering the latter on objectives, initially, and then on competencies training were and are the main outcomes of the curriculum reform (Connor, 2003).

Restructuring the curriculum is a dynamic and ongoing process by aligning it with European educational trends (Apateanu, 2009). The most current and essential aspect of the restructuring is moving toward a competency-based learning approach (Kitchen et al., 2017). The Romanian National Education Law no. 1/2011 assumed the eight key-competencies recommended by the European Commission as the objectives of the levels of compulsory and post-compulsory education: "1) communication in the mother tongue; 2) communication in foreign languages; 3) mathematical competence and basic competencies in science and technology; 4) digital competence; 5) learning to learn; 6) social and civic competencies; 7) sense of initiative and entrepreneurship; and 8) cultural awareness and expression" (OJEU, 2006).

To support teachers' adaptation to the implementation of the new curriculum focused on competencies, the Ministry of Education proposed several projects, including the "CRED: Relevant Curriculum, Open Education for all" project, financed by the European Social Fund (ESF), with a total budget of EUR 42 million (Grosseck et al., 2020). Also, since the fall of 2020, a didactic master's pilot-program started in eight large universities for the training and certification of teaching staff in the teaching-learning process focused on competence development (Ciolan et al., 2021).

However, are these programs and the others effective enough? The results obtained at PISA testing (Program for International Student Assessment) in 2018 tell not. In 2018, students from Romania achieved below-average results compared to the OECD (Organisation for Economic Co-operation and Development) rate in various areas: reading, mathematics, and science. OECD average for reading was 77%, in Romania was 59%; in mathematics, the OECD average was 77%, in Romania, 53% and in science, the OECD average was 78% and in Romania, 56% (Kitchen et al., 2017, p.47).

The current structure of the national curriculum in Romania tries to continue the idea of decentralization. The core curriculum establishes the minimum number of hours allocated to a subject. Schools can choose a part of the study subjects by choosing optional subjects through the curriculum at the school's decision (Connor, 2003). Disciplines with similar themes are organized in curricular areas (Ciolan et al., 2021). For example, biology is part of the Mathematics and Science Curricular area along with mathematics, physics, and chemistry.

In 2011, the Romanian National Education Law, Art. 23, defined the organization of the national pre-university education system in Romania for secondary education: (i) lower secondary or gymnasium education (middle school), which includes grades V – VIII, and (ii) upper secondary education which can be: - high school education: classes IX-XII/XIII, with the following profiles: theoretical, vocational and technological; and professional education with a minimum duration of three years.

Methodology

In order to investigate the development of procedural knowledge and competencies related to this knowledge, through the study of Biology, a critical analysis of Biology syllabi for middle and high school was conducted. The analysis followed the integrative and interrogative model proposed by Voiculescu (2011) and Bocoș (2017). Moreover, data related to the activities supporting the development of procedural knowledge (for example, investigations, microscopic observations, and practical activities in nature) were collected from ninth-graders high school and first-year university students through an online questionnaire (Annex 1).

Sample

The data collection was carried out through an online questionnaire, which targeted ninth-grade high school students from Cluj, Hunedoara, and Suceava counties and first-year university students from the Faculty of Biology and Geology and the Faculty of Chemistry and Chemical Engineering, Babeș-Bolyai University, Cluj-Napoca. Two target groups were chosen because the ninth-grade high school students learned from the new secondary school Biology syllabus from 2017, and those from the first year of college learned using the old Biology syllabus from 2008. In order to maintain an approximately equal proportion of respondents, the total number of participants in the first category was 129, and in the second category, 127.

Tools

The questionnaire was applied online in two copies, one intended for ninth-grade students and the other for first-year students, on the Google Form platform. Both questionnaires consisted of thirteen quantitative and qualitative questions, ensuring respondents' anonymity. There were eight multiple-choice questions and five Likert-type questions from 0 to 5. The questions varied, referring to the background of the study participants, the existence of materials for carrying out practical work (materials and laboratories), the carrying out of investigations, and practical activities in nature. Also, the questionnaire contained self-assessment questions aimed at the subjective reporting of the study participants regarding the activities that develop procedural competencies and their objective assessment through practical tests.

Study limitations

This study is an exploratory investigation of the development of procedural knowledge and competencies targeting this type of knowledge, through the study of Biology. However, there are several limitations to consider when interpreting the results and drawing conclusions. First, the study was limited to analysis only of Biology syllabi and not to other curricular materials such as textbooks or additional materials. Second, the survey targeted a limited number of students representing different backgrounds and ages. Thus, students in this sample represent a condensed number of high school ninth-grade and first-year university students. Furthermore, the lack of previous research studies on this topic made it difficult to report the results to previous discoveries made in the same field.

Results and discussions

Biology syllabi in Romanian schools

The school syllabus is the normative document from the curriculum that influences the teacher's activity in the classroom and determines the design, creation, and evaluation of didactic resources (including school textbooks) (Ardelean & Mândruț, 2012, p. 15). The Biology syllabus for middle and high school has changed throughout the curricular reform and has been oriented towards developing competencies. However, how well are they supporting developing of competencies? In what follows, a critical analysis of Biology syllabi is carried out to determine how much they sustain the development of procedural knowledge by guiding the teacher.

For whom is the middle school Biology syllabus?

The Biology syllabus aims at middle school students, grades V-VIII, between ages of eleven and fourteen. During this period, called early adolescence, young people begin to acquire abstract thinking capabilities. They can anticipate what will happen, for example, make hypotheses and operate with forms or representations (Spellings, 2005; Piaget, 1983). They also begin to realize what the consequences of their actions may be, that is, to form their identity. As Piaget believed, students' thinking can be developed in science through problem-solving questions, investigations, and practical laboratory work (Piaget, 1983).

Why or for what must follow this syllabus?

Harmonizing to the European educational trend, the Romanian Curriculum for the subject of Biology is centered on the priority development of the key-competencies: competencies in mathematics and basic competencies in sciences and technologies. Also, it indirectly values other key-competencies such as using new information and communication technologies, social and civic skills, communication in the mother tongue, and others (Biology syllabus, 2017). The old Biology syllabus for secondary education from 2008 focused on the framework and reference objectives (Ardelean & Mândruţ, 2012). Later, the axis of the school program was represented by general competencies-specific competencies-content units (Bocoş, 2017, p. 119). In other words, at least theoretically, the syllabus' vision values the competence paradigm.

General competencies are educational objectives with a high degree of generality, achieved at the end of an education cycle (four years) (Şăitan et al., 2017, p. 311). The four general skills formed during secondary education are: "1. Exploring biological systems, processes, and phenomena with scientific tools and methods; 2. Adequate communication in different scientific and social contexts; 3. Solving problem situations in the living world based on logical thinking and creativity; 4. The manifestation of a healthy lifestyle in a natural environment conducive to life;" (Biology syllabus, 2017). Among these four competencies, competencies 1 and 3, through the specific competencies, aim for the acquisition and training of procedural knowledge. The specific competencies are derived from the general competencies and have a lower degree of complexity and generality. Their achievement is carried out during one school year (Şăitan et al., 2017, p. 311). The specific competencies that engage directly procedural knowledge are: 1.2. and 3.2. Specific competence 1.2. describes students' ability to conduct investigations. It is formed progressively, from the fifth to the eighth grade, its complexity changing in terms of the student's degree of autonomy. In the fifth grade, he carries out simple investigations with the help of worksheets and assisted by the teacher. In the sixth grade, he independently carries out investigations based on worksheets. In the seventh grade, he creates his own investigation sheets and performs activities according to them. Lastly, the student is expected to design the investigation activities independently in the eighth grade. Competence 3.2. describes students' ability to use algorithms in an investigation. It is also formed progressively, starting from the fifth grade, when the student uses already known algorithms; in the sixth grade, the student selects and applies specific algorithms for investigation; in the seventh grade, he designs his algorithms, until in the eighth grade, when he identifies new or alternative solutions for solving some problem-based learning tasks (Biology syllabus, 2017).

What needs to be taught?

The contents of learning represent informational means by which the achievement of competencies is pursued (Şăitan et al., 2017, p. 311). One of the outcomes of the curriculum reform was the reconceptualization of content units to develop specific competencies. However, how current and how much do the contents serve to develop the learning style specific to this age? Compared to the Biology syllabus from 2008, the discipline's internal logic principle was replaced by the integrative principle of functions and systems. How effective is this reorganization yet? From a qualitative point of view, it has the intended positive effect because students learn the notions, concepts, and relationships established between living things and the environment with more meaning and significance. However, quantitatively, the content is far too dense to support the development of specific competencies and procedural knowledge.

How will teaching and learning be achieved?

In addition to general and specific competencies, the Biology syllabus contains other components. These converge towards forming the first and guiding the teacher in the educational process. The other components are introductory notes, examples of learning activities and practical works for each class, and methodological suggestions. The relationship between general and specific competencies and the other elements of the syllabus is illustrated in Figure 3.

What is the use of these components? The introductory note outlines an overview of the syllabus. It clarifies the didactic structure addressed and summarizes a set of significant recommendations for achieving the goals of the Biology discipline (Şăitan et al., 2017, p. 311). In the introductory note, the importance of studying this subject and its contribution to shaping the profile of the secondary school graduate is argued. It also contains and presents a set of attitudes and values that the student should acquire through the study of Biology:

- curiosity and the desire to ask questions
- the spirit of observation and receptivity
- the spirit of inquiry
- critical interpretation of observed facts
- the desire to share own experiences and facilitate the learning of others
- flexibility in applying the acquired knowledge in everyday life.

The values contributing to the student's personality are: respect for scientific truth and any form of life; cooperation between people; tolerance of others' opinions; caring for one's health and the environment (Biology syllabus, 2017). How are these attitudes and values formed among students from the perspective of the program's proposed route and contents? A link between general and specific competencies, contents, and learning activities must be established, and a formative character must be implemented to develop these attitudes and values.

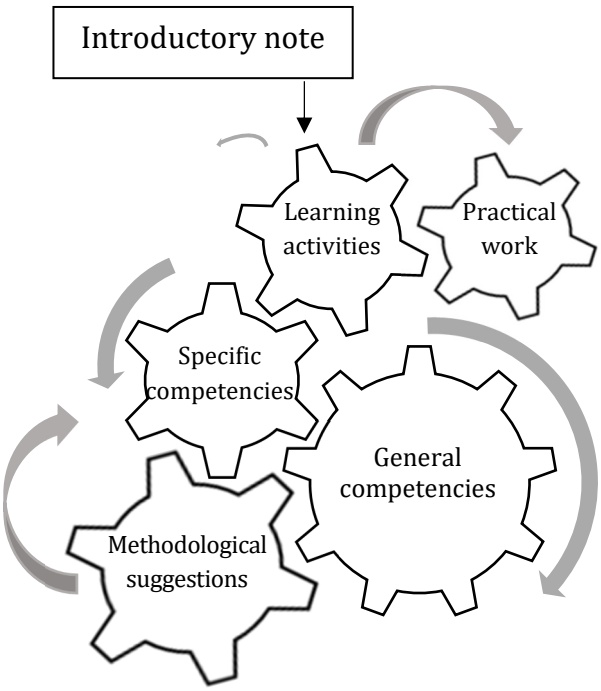


Figure 3. Relationship between components of Biology syllabus for middle school

Also, to achieve the educational goals, the teacher disposes of various examples of learning activities and practical works for each class and methodological suggestions. How useful is the information presented in these components, and how does it contribute to competency training? The careful reading of the program does not provide concrete indications of the realization of the learning activities: for example, neither material nor temporal resources. The same is noted in the case of practical works, where they are only listed without mentioning a concrete methodological suggestion for their realization.

Under what conditions (spatio-temporal and material) should and can these competencies and procedural knowledge be developed?

According to Bocoş, 2017, p.75, in the compilation of the curriculum, the time required to complete the program, the spaces and physical conditions, and the necessary material equipment must be mentioned. The Biology discipline is provided in the education framework plan having a time budget of one hour, respectively two hours (Table 2) (Şăitan et al., 2017, p. 311, Biology syllabus, 2017). Also, the syllabus mentions that teacher can allocate 75% of school time for competencies development, and the remaining 25% can be used depending on the characteristics of the students and the strategy of the school he is a part of.

Table 2. Number of hours for biology in lower secondary education (middle school)

Level	CC	**Class**			
		V	**VI**	**VII**	**VIII**
Lower secondary education (middle school)		1	2	2	1

(CC=core curriculum)

No details regarding the necessary spaces and valuable materials for the practical work are provided. The teacher must look to other resources for information to carry out a microscopic observation or an investigation. How affordable and easy to implement are they? The answers can be found in the questionnaire addressed to the ninth-grade and first-year university students discussed below.

How are outcomes (competencies) assessed?

Due to the pandemic and the need to rethink teaching-learning activities, methodological guides have recently been published to facilitate the assessment and teaching process focused on competencies. However, these materials were published late. The Biology syllabus briefly offers some evaluation methods: oral, written tests, portfolios, projects, and others, which must target specific competencies but not specifically mention how. What suggestions do the school textbooks give in this direction? The evaluation of procedural knowledge through practical tests is deficient, according to the students' answers in the questionnaire. Also, consulting the assesment questions and tasks issued for the Biology national competitions for students the ability to memorize and, very little, the ability to understand the questions or to do a practical activity are evaluated and by no means a specific competence.

High school Biology syllabi

High school Biology syllabi are the primary normative documents that guide the educational process at the upper level. These documents contain almost the same components as the middle school syllabus (Figure 3), except for examples of learning activities addressed to each specific competence. Following the same analysis algorithm proposed above, the answer to the question *to whom the syllabus is addressed* is teenagers aged between fifteen-nineteen years. Students during this period continue the process of acquisition and development of abstract thinking. They are in the formal operations stage when hypothetical-deductive reasoning develops even more (Piaget, 1983). Such reasoning presupposes the ability to advance hypotheses regarding the possibility of producing certain events and, at the same time, generate predictions regarding the evolution of those events. Structuring formal operations specific to this stage allows the student to experiment and test his ideas in the scientific sense of the word (Okun & Satisfy, 1977). These cognitive schemes can be developed through the medium of activities encouraging the formation of procedural knowledge: investigations, practical work, and microscope observations.

Why or for what must follow this syllabus?

According to the curricular reform, to develop competencies. Currently, for the ninth and tenth grades, the school syllabi were issued in 2004 and have not been revised since then. There was only one revision for the eleventh and twelfth grades in 2006, and these versions are currently in use. The general competencies proposed for development are: "1. Reception of informations about the living world; 2. Exploration of biological systems; 3. Using and creating models and algorithms to demonstrate the principles of the living world; 4. Correctly oral and written communication using the terminology specific to Biology; 5. The transfer and integration of knowledge and work methods specific to Biology in new contexts". General competencies 1 and 2 (ninth grade and tenth grade) and 2 and 3 (eleventh grade and twelfth grade) aim to develop procedural knowledge through specific competencies. From the beginning, because of the separate organization of the syllabi for each grade, the discontinuity can be observed, preventing the gradual development of competencies during the four years of study. Specific competencies 1.3. from the ninth and tenth grades stimulate the acquisition of procedural knowledge through the activity of observation under a microscope (e.g., observation of microscopic biological structures and observation of organs, plants, and animals). However, they emphasize and are oriented toward the contents and not on developing applicable practical knowledge in any field.

Also, specific competencies 2.1 follow the same pattern by using investigative activities on contents such as general characters of organisms, structure, and function. Competencies 2.2. does not indicate any higher degree of acquisition from one class to another, being formulated in the same type: "2.2. Processing the results obtained from investigations and formulating conclusions".

Regarding the eleventh and twelfth grades, the specific skills 2.1. develop procedural knowledge by suggesting the use of experiment and investigation, but are also oriented towards the specific contents of these classes: "Use of experiment and investigation to highlight the structure and functions of the human body/The use of observation, experiment, and investigation to highlight the structure and functions of biological systems". The specific competence "2.2. Processing the results obtained from investigations and formulating conclusions" is mentioned only in the eleventh grade syllabus, not in the twelfth grade. Specific competencies "3.2. The development and application of algorithms for identification, investigation, experimentation, and solving problems" keeps the same form in the eleventh and twelfth grades syllabi, and are not illustrating the acquisition of superior skills when moving from one grade to another.

What needs to be taught?

The contents provide the answer to this question. Although the syllabus aims to develop general competencies through specific ones, the latter ones are not oriented towards acquiring knowledge, skills, and attitudes, which can be applied in any field and situation but are formulated with applicability only to the studied contents. For example, in the ninth grade, the specific competence that fundamentally encourages the acquisition of procedural skills: "2.1. The use of investigation to identify some general characteristics of organisms and highlight cellular components and processes," in the tenth grade is presented as: "2.1. The use of investigation to highlight the structure and functions of organisms". Therefore, the educational approach maintains the orientation towards teaching content, not competencies. Only in the eleventh and twelfth grades, after the 2006 revision, did the specific competencies begin to indicate more general applicability and a more gradual character. Competence 2.1. is formulated as "Use of experiment and investigation to highlight the structure and functions of the human body" in the eleventh grade, and in the twelfth grade: 2.1. "Using observation, experiment and investigation to highlight the structure and functions of biological systems." (Biology syllabus, 2004, 2006).

How will teaching and learning be achieved?

Regarding the contents, Marinescu, citing Ciobanu (p. 21), declares that the Biology syllabus has a systemic conception, which ensures learning about living things in relation to each other. In the ninth grade, the emphasis shifts from the systematics of living things to knowledge about the structure and physiology of the cell, to those of living things' genetics, genetic engineering, and biotechnologies. In the tenth grade, the comparative study of the functions of living things is carried out, and in the eleventh grade, the study of the human body systems continues, integrating elements of first aid and hygiene. In the twelfth grade, molecular biology and genetics of the human genome are studied in depth. The same observation is valid in the case of the syllabus for high school; from a qualitative point of view, the topics addressed are current and of interest to the young teenager. From a quantitative point of view, however, it does not encourage developing competencies. Moreover, high school syllabi need to mention that the contents should be approached from the perspective of specific competencies.

Furthermore, the lack of examples of learning activities supporting the development of specific competencies emphasizes the idea of teaching and learning content, not developing the first ones. It does not create a connection through which the transition from contents to competencies is achieved, nor their gradual formation. The only learning activity suggestion appears in the "methodological suggestions" category, where several activities are listed with a general character, almost identical in difficulty level and the only difference between these activities appears in the focus of the contents. Therefore, even here, the priority, although desired, is not the competence but the contents.

Moreover, a list of mandatory practical activities is indicated without providing indications of their achievement or the connection with a specific type of competence. The methodological suggestions include a series of didactic methods that can be integrated into the lessons but does not mention the context of their realization nor the connection with the specific competencies.

In what conditions?

Regarding the temporal conditions, at high school, the biology discipline has a budget of one hour or two hours, depending on the field and profile and specialization (Table 3); (Marinescu, 2018, School curriculum for the discipline of biology, 2004, 2006).

Table 3. Number of hours for biology in inferior secondary education

Level	Channels	Profiles	Specializations	Class							
				IX		X		XI		XII	
				CC	DC	CC	DC	CC	DC	CC	DC
Upper secondary education (high school)	Theoretical	Real	Natural Sciences	1	1	1	1	1	1	1	1
	Theoretical	Real	Mathematics-Informatics	1	1	1	1	1	-	1	-
	Theoretical	Social Sciences	All	1	-	1	-				
	Vocational	All	All	1	-	1	-	1*	1*	1*	1*
	Technological	All	All	1	-	1	-	1*	-	1*	-

(*only some specializations; CC=core curriculum; DC=differentiated curricula)

As for indication of the materials necessary for carrying out the activities in class, details also need to be provided. For example, for the realization of the practical work "plasmolysis and deplasmolysis," the teacher has the manual as the only support; the syllabus does not specify the materials needed, the organism on which the process can be observed, nor how.

How are outcomes (competencies) assessed?

All high school Biology syllabi mention that the assessment will target the formation of specific competencies and associated contents, offering as an example the following assessment items or modalities:

"- selecting the correct answer;
- the correct association between notions and statements;
- completion of sentences, drawings, schemes, and lacunae;
- recognitions of the true-false type;
- structured questions;
- problems;
- essays, structured essays;
- formulating hypotheses or conclusions related to biological processes;
- making an investigation plan;
- solving worksheets for practical applications" (Biology syllabus, 2006).

The examples provided, except for the last 3, have a predominant evaluative character oriented toward the contents and not toward the students' skills, knowledge, or attitudes. Again, the ability of memorizing is tested. Furthermore, there need to be more concrete examples of evaluation: how can a practical test be implemented? How can a teacher measure procedural knowledge?

Data analysis

In what follows next, the collected data through online questionnaire will be analyzed and discussed.

1. Intragroup comparisons

The intragroup comparisons were made taking into account the students' backgrounds. As can be seen in Figures 4 and 5, most pupils and students come from urban environments (over 60% of pupils and over 95% of students). This aspect was considered in the first five questions, which concerned school infrastructure (equipment with laboratories and laboratory instruments) due to the poorer funding of schools in rural areas compared to urban ones. Tomuletiu and Moraru (2010) confirm the poor funding of education in the rural education system through their study. Their results indicated that rural schools could have more science labs and gyms.

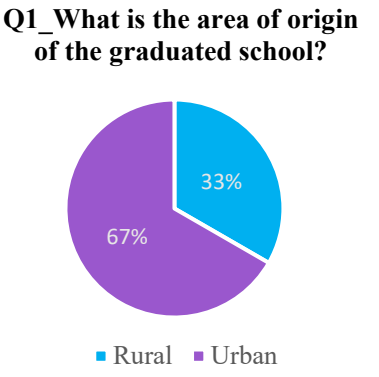


Figure 4. Graphical representation of the distribution of the responses to question no. 1 (ninth grade students)

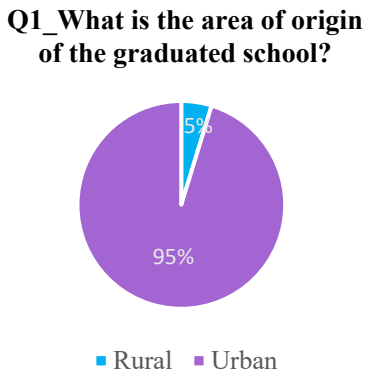


Figure 5. Graphical representation of the distribution of the responses to question no. 1 (first year students)

According to Linn and Harlow (1997), laboratories play an essential role in science teaching-learning because they facilitate students' understanding of abstract concepts using materials, stimulate the development of procedural knowledge through practical work, and contribute to students' motivation to study science. How well equipped with science laboratories are the schools in Romania? The answers to question number 2, Figures 6 and 7, regarding the

existence of a laboratory in the graduate school, confirm that not so well. Moreover, the answers reinforce the idea that funding remained poorer in rural schools than in urban ones, because, more than 50% of them are not equipped with laboratories. In the case of college students, mostly from an urban area, about 80% answered that the graduate school was equipped with laboratories, and approximately 17% answered no.

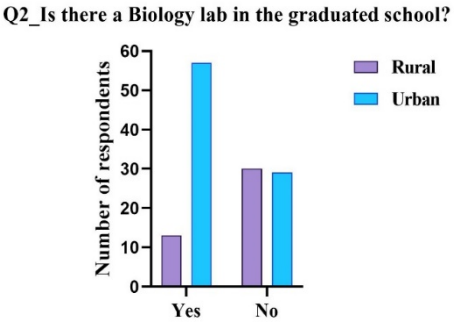


Figure 6. Graphical representation of the distribution of the responses to question no. 2 (ninth grade students)

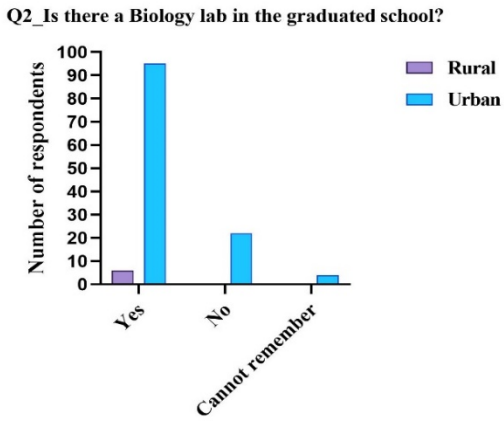


Figure 7. Graphical representation of the distribution of the responses to question no. 2 (first year students)

According to Figure 8, even though the schools were equipped with laboratories, they needed more materials and tools for carrying out practical work. More than 50% of pupils from rural areas answered that the laboratory was not provided with instruments, and only 10% answered that the laboratory had sufficient instruments. About 35% of pupils from an urban area declared that the laboratory was not adequately equipped with instruments. About 17% answered that instruments existed, however, in a low number. 40% stated that it was equipped with a sufficient number of instruments, and not even 1% of the respondents declared that the instruments were in high number.

In the case of college students, who were mostly from urban areas, more than 50% of the respondents stated that the laboratories were equipped with very few instruments. About 10% of them stated that the laboratories had no instruments, and over 30% stated that the laboratories were adequately supplemented with instruments (Figure 9).

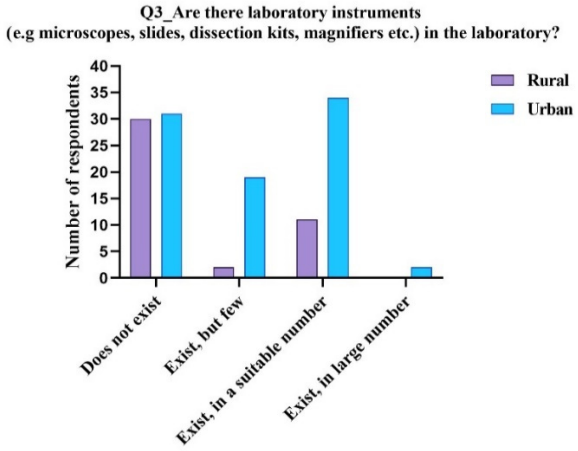


Figure 8. Graphical representation of the distribution of the responses to question no. 3 (ninth grade students)

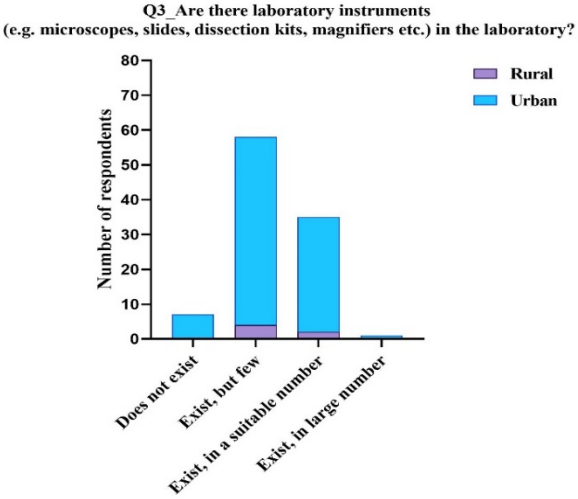


Figure 9. Graphical representation of the distribution of the responses to question no. 3 (first year students)

Students' progress rate depends on the availability of facilities that aid learning. The provisions of facilities are inadequate in schools. The defective equipment of laboratories led to the predominant non-use of the Biology laboratory, according to Figures 10 and 11, or the microscope (Figures 12, 13). The problem of equipping schools with laboratories and laboratory instruments is

not new but is a recurring one, related to the government's investment in education. According to the data obtained by Eurostat, until 2019, Romania was part of the countries that allocated less than 4% of GDP to education. In 2018, 29.3 billion lei were allocated, representing 3.1% of GDP; in 2019, 38.2 billion lei (3.8% of GDP). According to the same data from Eurostat, Romania has allocated for education consistently below the average allocated in Europe.

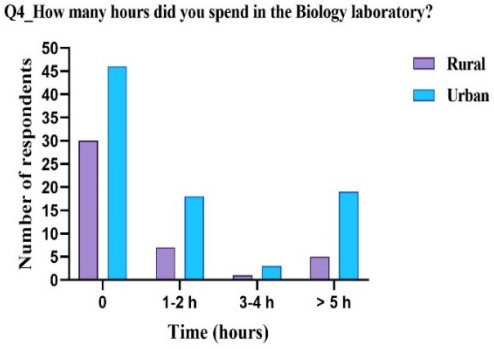


Figure 10. Graphical representation of the distribution of the responses to question no. 4 (ninth grade students)

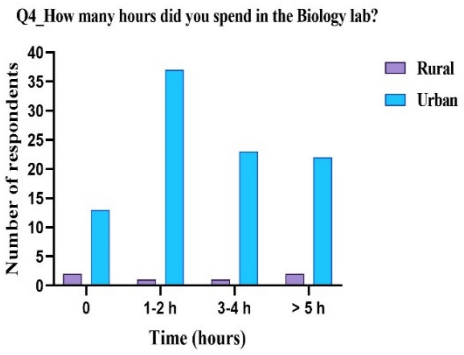


Figure 11. Graphical representation of the distribution of the responses to question no. 4 (first year students)

2. Intergroup comparisons

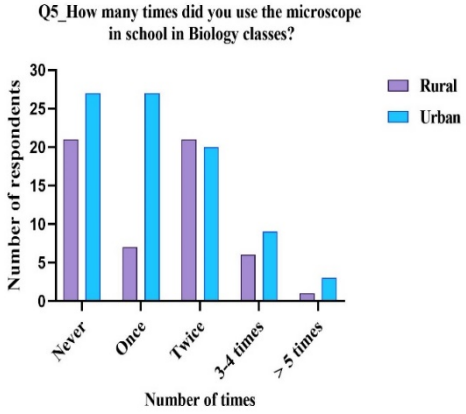


Figure 12. Graphical representation of the distribution of the responses to question no. 5 (ninth grade students)

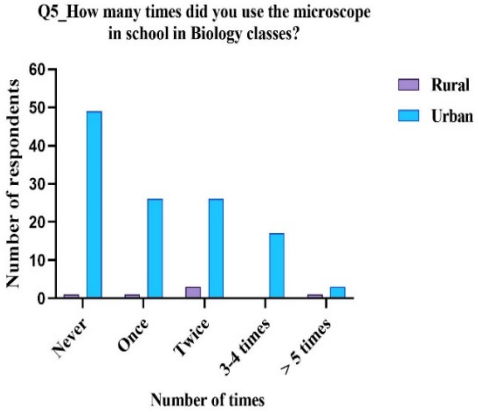


Figure 13. Graphical representation of the distribution of the responses to question no. 5 (first year students)

According to the answers to question 6, more than 50% of high school and college students stated that they did not participate in any activity in nature. About 10% and 20% carried out at least one activity in nature, 10% and 14% two activities in nature, and below 5% and 10% answered that they carried out three, four, or five activities in nature (Figure 14). Why is the number so small?

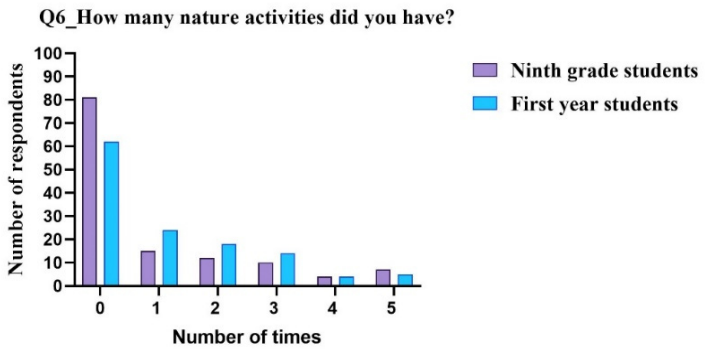


Figure 14. Graphical representation of the distribution of the responses to question no. 6

Question number 7 concerned the number of investigations/experiments carried out in school and of other activities that support the development of procedural knowledge. Approximative 33% and 40% of participants did not perform any experiment/investigation; 25% and 21% answered that they had conducted only once; 21% and 18% performed two experiments/investigations and less than 10% answered that they had conducted three, four, or more than five experiments/investigations (Figure 15).

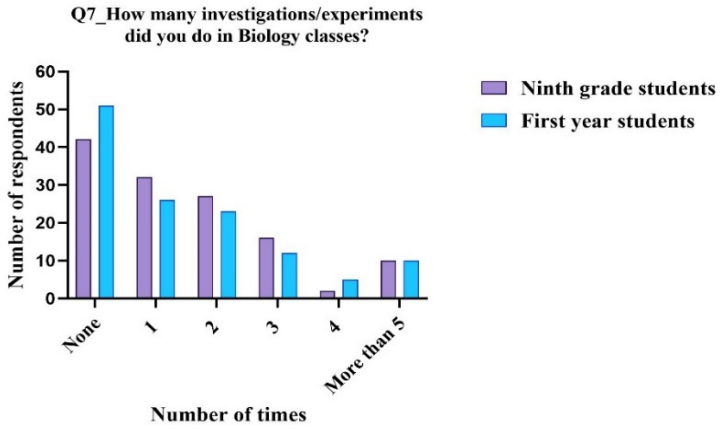


Figure 15. Graphical representation of the distribution of the responses to question no. 7

The results in questions 6 and 7 may suggest the teacher's inadequate preparation for investigative activities. In a study conducted by Rogers in 2021 related to teachers' perspectives on implementing competency-based education, 75% of the teachers declared that "I could use more professional development in learning how to implement CBE." The question that received the most substantial agreement (80%) was about needing more professional development, while the highest disagreement (41%) was that training was being provided.

Questions 8, 9, and 10 are self-assessment questions and aim at how well pupils and students can self-assess themselves in carrying out practical activities by using procedural knowledge. According to their answers, approximately 40% and 46% cannot make a microscopic preparation at the end of a learning cycle (Figure 16). Also, more than 70% stated that they could not carry out a complete investigation in the laboratory, and more than 25% could not carry out an investigation in nature (Figures 17 and 18). These results reflect the need for more implementation of practical activities in order for students to develop procedural knowledge.

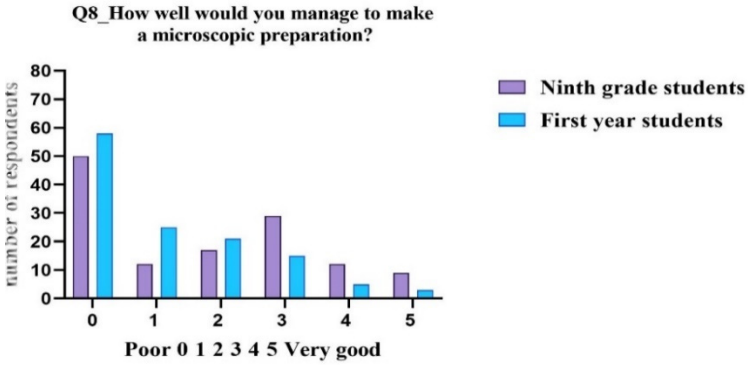


Figure 16. Graphical representation of the distribution of the responses to question no. 8

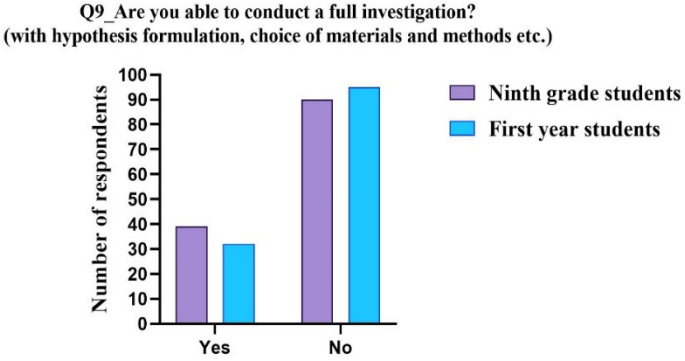


Figure 17. Graphical representation of the distribution of the responses to question no. 9

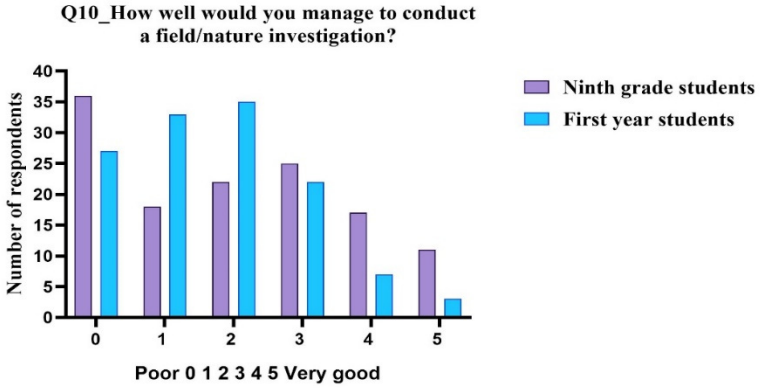


Figure 18. Graphical representation of the distribution of the responses to question no. 10

Figure 19 confirms the presumption that, although the Biology syllabus aims at developing competencies and implicitly procedural knowledge, their concrete evaluation still needs to be carried out correctly. Students are still assessed on the amount of information they retain rather than on the competencies they possess. More than 50% of pupils and more than 70% of students were never assessed by practical tests. This poor evaluation is also reflected in the subjects for the Romanian Biology National Competitions and the Biology baccalaureate exam. Moreover, in a validation phase of a test designed to measure specific competencies 1.2. and 1.3. at seventh-grade students, approximately 20 participants scored below the five mark, 28 above five but below six, and only 4 above six and 2 above the seven mark. No result was obtained above the eight mark (Table 4).

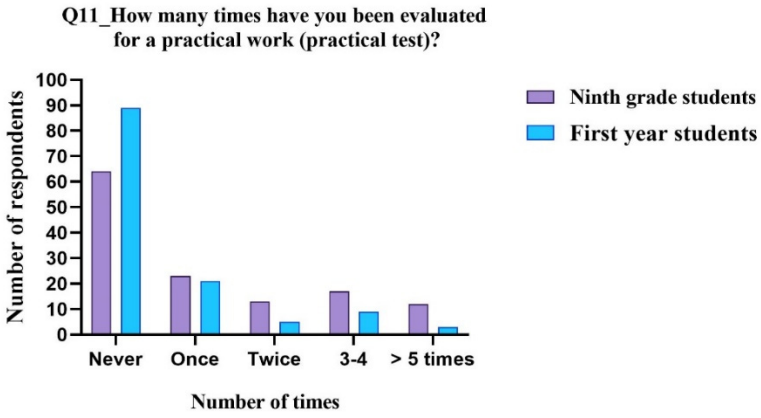


Figure 19. Graphical representation of the distribution of the responses to question no. 11

Table 4. Test validation results, unpublished

Grades	<5	<6	<7	<8	>8
Number of students	20	28	4	2	0

The last two questions concerned how pupils and students appreciate the importance of implementing practical work in Biology classes. According to the answers, more than 80% of pupils and approximately 97% of the students consider practical work in Biology classes important, giving marks of 4 and 5. When asked how often they would like to apply practical work in Biology classes, over 80% of pupils and over 96% of students would have liked to do more practical work (Figure 20 and 21).

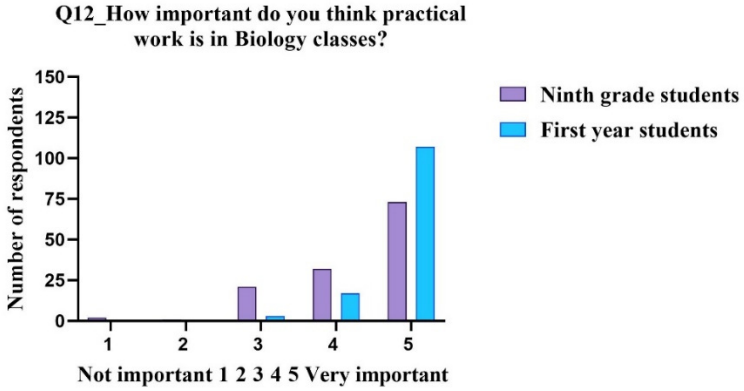


Figure 20. Graphical representation of the distribution of the responses to question no. 12

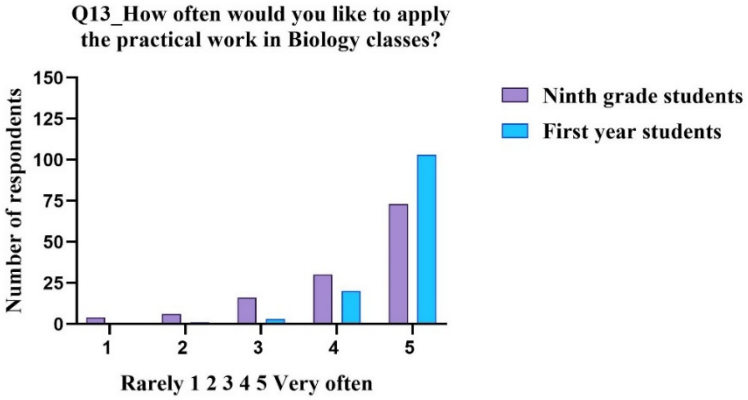


Figure 21. Graphical representation of the distribution of the responses to question no. 13

Conclusions and future directions

From the critical analysis of the Biology syllabi for middle school and high school, it can be concluded that the educational orientation towards the acquisition of competencies is attempted through the proposed learning outcomes. However, the *didactic of contents* is still predominant because of the dense subject content found in syllabi which is eventually expanded in the Biology textbooks, mostly as scientific theory. The lower Biology school syllabus is the most promising, approaching the CBE paradigm by offering concrete examples of practical activities to develop procedural knowledge and competencies. A revision of the high school syllabi is necessary. They are old and not up to date with current educational requirements. High school syllabi still retain a orientation towards content rather than acquisition of knowledge, skills, and attitudes applicable in any context. On the other hand, the syllabi need to be formulated concretely enough to guide teachers in implementing activities aimed at developing procedural knowledge and, implicitly, skills. It also does not provide any indication of their evaluation. Evaluation, in Romanian education, is still focused towards the acquisition of abstract/theoretical knowledge and not the ability to put into practice the knowledge and skills applicable in any situation.

Several aspects can be concluded from the results of the questionnaire addressed to students. First, the insufficient financing of Romanian education determines the lack of laboratories and tools for carrying out practical work. It is necessary to emphasize the need to use Biology laboratories and update their endowment with materials in all schools because they are necessary spaces for forming procedural knowledge and exploratory competence. Second, the lack of logistics necessary to carry out practical work led to the avoidance of implementing some fundamental activities to train procedural knowledge and to the poor self-evaluation of students in this direction. Failure to carry out practical activities may suggest the lack of teachers' training, as well as the lack of guidance materials in this topic.

Last, preserving a traditional, subject-conceptual content-oriented assessment still prevails in the Romanian educational system. The significant lack of practical tests, both in schools and at Biology national competitions and national exams, confirms the genuine educational purpose: acquiring conceptual knowledge and not competencies.

What can be done in the future? At a macro level, first of all, a massive reform of the syllabi is needed to reduce the amount of content and to provide concrete indications for developing competencies targeting procedural knowledge. There is also a need for prioritization and a massive financial investment in education to provide laboratories and equipment necessary for developing

procedural knowledge. Moreover, the organization of conferences, workshops, and training related to CBE implementation topics should be carried out constantly. These teacher training activities should be carried out with a small number of participants to ensure their success.

At a micro level, related to teaching-learning activity, the teacher must implement the classroom activities that encourage:

- discovery through direct observation and exploration, using didactic methods such as observation, modeling, experiment, demonstration, and others;
- curiosity, starting from a question (why) and reaching a result through the question (how) and by carrying out an investigation in nature or in the laboratory;
- team collaboration to explore the living world;

As an alternative to the lack of facilities for practical activities, teachers can use virtual reality: online educational platforms such as *Labster (*https://www.labster.com/), *Phet interactive simulations* (https://phet.colorado.edu/), *Gizmos* (https://gizmos.explorelearning.com/), and others that simulate various experiments and demonstrations.

It would also be helpful to create practical guides for teachers accessible to any teacher, which instruct practical activities. Collaboration between teachers and creating an online community where methodological suggestions can be exchanged would be another alternative to support competencies development.

Based on this research, it can be concluded that the Romanian educational system, at this stage, is not yet prepared to develop and assess procedural knowledge. However, a teacher can develop these outcomes by implementing practical activities using the laboratory, nature, and online instruments.

Acknowledgement

The authors would like to thank teachers and students who supported this research by sharing and completing the questionnaire.

REFERENCES

Apateanu, D. (2009). The educational policy in Romania. *Available at SSRN 2562872*.

Ardelean, A., & Mândruț, O. (2012). Competencies training didactics. *"Vasile Goldiș" University Press*, p. 11, 15. (Didactica formării competențelor).

Bîrzan, N. (2010). Implementation guide of the modernized curriculum for the high school level. Biology, Chișinău, Publishing house *Cartier*, p. 106 (Ghid de implementare a curriculumului modernizat pentru treapta liceală. Biologie).

Bloom, B. S. (1956). Taxonomy of educational objectives: The classification of educational goals. *Cognitive domain.*

Bocoș, M.D. (2017). Didactics of Pedagogical Disciplines: A Constructivist Framework, 4th Edition. Publishing house *Paralela 45*, p. 72-73, 75. (Didactica disciplinelor pedagogice: un cadru constructivist, Ediția a 4-a).

Cheetham, G. & Chivers, G. (1996) Towards a holistic model of professional competence. *Journal of European Industrial Training*, 20(5), 20-30.

Cheetham, G. & Chivers, G. (1998) The reflective (and competent) practitioner: a model of professional competence which seeks to harmonise the reflective practitioner and competence-based approaches. *Journal of European Industrial Training*, 22(7), 267 – 276.

Ciobanu, M. (2008). Didactics of biological sciences. Publishing house*: Editura Didactică și Pedagogică*, *București*, p. 9-28 (Didactica științelor biologice).

Ciolan, L., Iftimescu, S., & Stingu, M. (2021). The institutional conditions of adapting to future challenges in the Romanian education system, *CEU Center for Policy Studies.*

Connor, G. S. (2003). The reform of education in Romania and its implications for the teaching of geography in secondary schools (Doctoral dissertation, University of Georgia).

Council Recommendation of 22 May 2018 on key competences for lifelong - 2018/C 189/01, Annex 1, p. 7

De Jong, T., & Ferguson-Hessler, M. G. (1996). Types and qualities of knowledge. *Educational psychologist*, *31*(2), 105-113.

Eurostat data, retrieved online on 20th of November 2022. https://ec.europa.eu/eurostat/databrowser/view/gov_10a_exp/default/bar?lang=en

Gelman, R.; Greeno, J.G. (1989). On the nature of competence. Principles for understanding in a domain. In Resnick, L.B. (ed.). *Knowing, learning and instruction*. Hillsdale, NJ: Erlbaum, p. 125-186.

Greeno, J.G.; Riley, M.S.; Gelman, R. (1984). Conceptual competence and children's counting. *Cognitive Psychology*, Vol. 16, p. 94-143.

Grosseck, G., Holotescu, C., & Andone, D. (2020). Open educational resources in Romania. In *Current State of Open Educational Resources in the "Belt and Road" Countries*, Springer, Singapore p. 151-173.

Kitchen, H., Fordham, E., Henderson, K., Looney, A., & Maghnouj, S. (2017). OECD reviews of evaluation and assessment in education Romania. *OECD Reviews of Evaluation and Assessment in Education. OECD Publishing.*

Klieme, E., & Leutner, D. (2006). Competence models for the assessment of individual learning outcomes and review of educational processes. *Zeitschrift für Pädagogik*, 52(6), p. 876–903. (Kompetenzmodelle zur Erfassung individueller Lernergebnisse und zur Bilanzierung von Bildungsprozessen: Beschreibung eines neu eingerichteten Schwerpunktprogramms der DFG).

Linn, R. R., & Harlow, F. H. (1997). *FIRETEC: a transport description of wildfire behavior* (No. LA-UR-97-3920; CONF-980121-). Los Alamos National Lab. (LANL), Los Alamos, NM (United States).

Mager, R. F. (1984). Preparing Instructional Objectives (2nd edn), *Pitman Learning Inc.*

Mândruț, O., Catană, L., & Mândruț, M. (2012). Training centered on Research-Innovation-Training-Development competencies. *Universitatea De Vest „Vasile Goldiș" Arad, Centrul de Didactică și Educație Permanentă*, 31 Păunescu, p. 13. (Instruirea centrată pe competenţe Cercetare-Inovare–Formare–Dezvoltare).

Marga, A. (2002). Reform of Education in Romania in the 1990s: A Retrospective. *Higher Education in Europe*, *27*(1-2), 123-135.

Marinescu, M. (2018). Didactics of biology. Theory and applications. Publishing house*: Paralela 45*, p.21. (Didactica biologiei. Teorie și aplicații).

Ministry of Education, (2004). Biology curriculum for ninth grade (high school).

Ministry of Education, (2004). Biology curriculum for tenth grade (high school).

Ministry of Education, (2006). Biology curriculum for eleventh grade (high school).

Ministry of Education, (2006). Biology curriculum for twelfth grade (high school).

Ministry of Education, (2017). Biology curriculum for middle school.

OJEU - Official Journal of the European Union (2006). Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC).

Okun, M. A., & Sasfy, J. H. (1977). Adolescence, the self-concept, and formal operations. *Adolescence*, *12*(47), 373.

Piaget, J. (1983). Piaget's theory. In P. Mussen (Ed.), *Handbook of child psychology, volume 1.* New York: Wiley.

Rogers, A. P. (2021). Exploring secondary teachers' perspectives on implementing competency-based education. *The Journal of Competency-Based Education*, 6(4), 222-232.

Romanian National Education Law, 2011, retrieved on 19th of November, 2022 https://edu.ro/sites/default/files/_fi%C8%99iere/Legislatie/2022/LEN_2011_actualizata_2022.pdf

Șăitan, T., Olteanu, S., Afrim, C., Tanur, I, Miricel, F., Manea, C., Neagu, A., Divoiu, M., & Mihai, A. (2017). Training guide for Biology teachers. Tenure, Definitive. Publishing house: Didactica Publishing House, p. 311. (Ghid de pregătire pentru profesorii de Biologie. Titularizare, Definitivat).

Saks, K., Ilves, H., & Noppel, A. (2021). The impact of procedural knowledge on the formation of declarative knowledge: How accomplishing activities designed for developing learning skills impacts teachers' knowledge of learning skills. *Education Sciences*, 11(10), 598.

Sophian, S. (1997). Beyond competence: the significance of performance for conceptual development. *Cognitive Development*, Vol. 12, p. 281-303.

Spellings, M. (2005). Helping your child through early adolescence. *Washington DC: US Department of Education*

Ten Berge, T., & Van Hezewijk, R. (1999). Procedural and declarative knowledge: An evolutionary perspective. *Theory & Psychology*, 9(5), 605-624.

Tomuletiu, E. A., & Moraru, A. (2010). Rural education in Romania: Present and perspectives. *Procedia-Social and Behavioral Sciences*, *2*(2), 402-406.

VanScoy, A. (2019). Conceptual and procedural knowledge: A framework for analyzing point-of-need information literacy instruction. *Communications in Information Literacy*, 13(2), 3.

Voiculescu, F. (2011). Paradigm approach by competences. Material created within the project POSDRU "Quality, innovation, communication in the system of continuous training of didacticians in higher education". (Paradigma abordării prin competențe).

Weinert, F. E. (2001). Concept of competence: A conceptual clarification. In D. S. Rychen & L. H. Salganik (Eds.), *Defining and selecting key competencies*, Hogrefe & Huber Publishers. p. 45–65.

Winterton, J., Delamare-Le Deist, F., & Stringfellow, E. (2006). Typology of knowledge, skills and competences: clarification of the concept and prototype. *Luxembourg: Office for Official Publications of the European Communities*. p. 13-16.

Annex 1

This research aims to evaluate the existence and implementation of practical works in the Biology discipline during a school cycle (middle school or high school), activities that support the development of procedural knowledge among students.
Practical work includes macro and microscopic observations, experiments, demonstrations, nature activities data collection from the field, investigations, and others. Procedural knowledge is measured by the students' abilities to carry out the previously mentioned activities.
All information provided by completing this questionnaire will only serve the purpose of research and will be confidential.

Choose one answer:

Q1: What is the area of the graduated school?

	Rural		Urban

Q2: Is there a Biology laboratory in the graduated school?

	Yes		No

Q3: Are there laboratory instruments (e. g microscopes, slides, dissection kits, magnifiers etc.) in the laboratory?

	Does not exist
	Exist, but few
	Exist, in a suitable number
	Exist, in large number

Q4: How many hours did you spend in the Biology laboratory?

	0		1-2 h		3-4 h		> 5 h

Q5: How many times did you use the microscope in school in Biology classes?

	Never		Once		Twice		3-4 times		> 5 times

Q6: How many nature activities did you have?

	0		1		2		3		4		5

Q7: How many investigations/experiments did you do in Biology classes?

	None		1		2		3		4		More than 5

Q8: How well would you manage to make a microscopic preparation?

Poor		0		1		2		3		4		5	*Very good*

Q9: Are you able to conduct a full investigation? (with hypothesis formulation, choice of materials and methods etc.)

	Yes		No

Q10: How well would you manage to conduct a field/nature investigation?

Poor		0		1		2		3		4		5	*Very good*

Q11: How many times have you been evaluated for a practical work (practical test)?

	Never		Once		Twice		3-4 times		> 5 times

Q12: How important do you think practical work is in Biology classes?

Not important		1		2		3		4		5	*Very important*

Q13: How often would you like to apply the practical work in Biology classes?

Rarely		1		2		3		4		5	*Often*

STUDIA UBB PSYCHOL.-PAED., LXVII, 2, 2022, p. 139-162
(Recommended Citation)
DOI:10.24193/subbpsyped.2022.2.07

TEACHING MUSIC EDUCATION AT PRIMARY SCHOOL IN ROMANIA: A QUALITATIVE ANALYSIS ON TEACHERS TRAINING

Daniel-Alex MILENCOVICI[1]

ABSTRACT. A quality education is a major goal of each country because it is a predictor of the success of future societies. When it comes to quality education, initial teacher training should be a landmark of the universities that prepare the future teachers. Music education can contribute to the development of quality education from a young age of children, needing, therefore, well trained teachers to perform it.

Exposing children to quality music education in primary school does not restrict to the class hours. It might cover different learning situations, as music can accompany most of the teaching hours, in an integrative manner, and music activities, as chorus, can contribute to developing key competences of kids, ranging from the esthetic and cultural ones, till the social or cognitive ones.

The article aims to highlight the importance of training musical skills that the teaching staff who teaches music education at primary school in the national education system in Romania must have. Expert oppinions are echoed in the article, drawn from 19 semistructured interviews carried out in May-June 2021. The diagnosis and proposals of academics training the respective teachers, of experienced practitioners guiding and evaluating teachers in schools, point towards possible revision of curriculum in initial teacher education, to ensure better trained professionals to teaching music in primary education.

Keywords: Musical skills, initial teacher education, teachers, primary school.

[1] PhD student, Doctoral School of Music and Theater; MA in Educational Sciences, West University of Timisoara; Teacher of Music at School nr. 25 Timisoara, Romania, daniel.milencovici94@e-uvt.ro

ZUSAMMENFASSUNG. Eine qualitative Analyse zur Ausbildung von Lehrkräften, die Musikpädagogik an der Grundschule im voruniversitären System in Rumänien unterrichten. Eine qualitativ hochwertige Bildung ist ein wichtiges Ziel jedes Landes, weil es ein Prädiktor für den Erfolg zukünftiger Gesellschaften ist. Wenn es um eine qualitativ hochwertige Ausbildung geht, sollte die Lehrererstausbildung ein Meilenstein der Universitäten sein, die ihre Ausbildung anbieten. Die Musikpädagogik kann zur Entwicklung einer qualitativ hochwertigen Bildung beitragen und kann bereits in jungen Jahren beginnen.

Dieser Artikel zielt darauf ab, die Bedeutung der Ausbildung musikalischer Fähigkeiten hervorzuheben, die das Lehrpersonal, das die Musikpädagogik an der Grundschule im nationalen Bildungssystem in Rumänien unterrichtet, haben muss. Auch das Entdecken bestimmter Ausbildungsbedürfnisse und das Vorschlagen von Lösungen kann eine Verbesserung in der Lehre von Musik und der Erstausbildung darstellen, die zukünftige Lehrer in dieser Hinsicht benötigen. Wir haben diese Forschung durchgeführt, die die Aufmerksamkeit von Spezialisten auf sich ziehen kann, Menschen mit Entscheidungsrollen in Rumänien, aber auch Lehrer, die diese Disziplin unterrichten und ausgebildet werden können, um Kindern von klein auf musikalische Fähigkeiten zu entwickeln.

Als investigative Instrumente nutzte ich das Interview für die qualitative Analyse. Die Bevölkerung, an die ich mich wandte, waren 19 Universitätsprofessoren, Spezialisten für Pädagogik, Musikdidaktik, spezialisierte Inspektoren, Methodisten und Dirigenten, die positiv auf die Herausforderung des behandelten Themas reagierten. Der Vorschlag zur Änderung einiger Bildungspolitiken ist ein Ergebnis, das eine Lösung für das in diesem Artikel beschriebene Problem bieten kann.

Schlüsselwörter: Musikalische Fähigkeiten, Erstausbildung, Lehrer, Grundschulzyklus, Bildungspoliti.

I. Introduction

Starting from the literature and studying the results of developed countries with a modernized education system, we propose a research aiming to provide possible hints for improving teaching music from the early stage in schooling. Because today's students represent the future of tomorrow's country, being the adults who will act in society according to their competence, character and personality, changing certain paradigms and acting on time in the education system, children in Romania can benefit from a quality music education, through which to understand the esthetics and harmony of sounds combining with the practice and beauty of the music-artistic culture.

In 2018, the Romanian Institute for evaluation and Strategy developed a study on Romanians' attitudes, habits and behaviors in relation to music. I will present some worrying data for me as a music specialist, data relevant to the adult population, referential to be able to make a change for the next generation of adults.

The study evaluated the musical preferences of Romanians, and 9 out of 10 Romanians said they listen to music. Of the population surveyed, only 27% listen to classical music, and those are people aged 51 to 65 who have higher education. What I find even more worrying is that at national level, the last festivals attended by respondents were Untold and Neversea, while the George Enescu International Festival "enjoyed" the participation of only 1% of the survey respondents. Of course, many other aspects are described in the respective study, both in the register of general musical culture, esthetic taste, culture-informed consumption (musical), but it is not the object and space of our dedicated work.

The present study aims to bring added value to education in Romania through the contribution of education through quality music, from early age. The most modern systems attach value and importance to this discipline, and the specialized teachers are those who teach and perform activities with students in order to make the learning outcome visible.

Personally, as a music education teacher in lower secondary school, I noticed that in the 5th grade, the teacher has to start the subject from 0, because children do not come up with certain knowledge they should already acquire from music and movement classes in primary education.

As "Music is the cure of the mind", musical education can contribute to shaping healthy minds from childhood. Therefore, a musical education based on high-quality and modern standards, 'should be ensured, by well trained teachers. What it can be done in initial teacher education in Romania, to ensure well trained teachers for music education in elementary schools? We try to answer this question further on, mirroring the expert voice of different stakeholders, and their proposals.

In Romania, teachers who are preparing to teach music education at primary school go through a semester of music methodology and didactics, in specialized universities, but there are universities that have in the music-specific optional education plan. There is the possibility of finishing a prepedagogical high school that trains young people to be able to teach. In these pedagogical high schools, students learn more than one semester and have the opportunity to practice more of the learned theory.

II. Relevance of the topic; literature review

Music, both as a phenomenon in itself and as a discipline studied in various forms from the preparatory class to the end of life, proved his extraordinary effect to the entire body. Not only research on music lovers, specialists, performers, artists, musical critics, but advance brain research proved the effects of music on the people body and performance. According to a study published in the Journal of the National Cancer Institute, there are a number of effects that quality music produces: It reduces anxiety, increases relaxation of the entire body, optimizes brain function, increases socialization, improves memory, etc. (Kerkvliet, 1990). Also, the literature points toward neuroeducation and cognitive neuroscience, which provides information and concrete data about the interaction of musical instruction in students in relation to brain development, and in this context, we can talk about brain plasticity, multisensory interactions, the executive and motor functions that develop and make connections with sound art (Curits, Laurie, Fallin, Jana, 2014).

As example, the renowned neurosurgeon Ben Carson, being so convinced of the effects of classical music, in the surgeries that made him famous and by which he separated two Siamese joined at the head, he carried out the medical activity on a musical background (Carson & Lewis, 2006). These are just some of the proved benefits and testimony of some personalities who consider music very important in carrying out their own activities.

As this art produces real transformations, it can have major implications on the education of children from an early age. The study of music in childhood is of special importance in modern and performant systems of education, such as in Japan, China, South Korea, Finland, Denmark and other countries. It might not be by chance that they enjoy as well remarkable results at PISA tests.

If in Japan children perform 12 hours of musical activities per week with a specialized teacher (acts and details, 2014), in Romania there are some discussions that are not at all for the benefit of child development through art. At the level of the primary school, the II grades are awarded, and one hour at the III-IV grades for students to study a new language accessible to all and encountered anywhere in the world, without borders of any kind. Music and movement, as vocational discipline, is still taught by a teacher who is prepared for a semester within the PIPP (Pedagogy of Primary and Preschool Teacher Education, in Romanian) specialization or, at best, in pedagogical high schools.

The importance of music education for acquiring basic competences for life (the 8 key competences) is widely recognised. Therefore, the Council of the European Union adopted since 2007 a cultural agenda that highlighted the importance and value of music education in the development of creativity, esthetics and well-being.

Barbara Crowe, researcher and director of the music Therapy Department at Arizona State University, said: "Music can have a decisive influence when it comes to choosing between withdrawal and engagement, isolation and interaction, chronic pain and comfort, demoralization and dignity". Music starts from the soul and addresses the soul!

III. Methodology

III.1. Research design

The purpose of the research presented in the following is to explore the opinion of specialists in the field, regarding the necessary competences in teaching this subject with vocational specific and the extension with which they are covered in the practical-professional configuration of the curriculum preparing for this discipline.

Because each researcher sets goals that help him/her structure the vision of the proposed topic and design his/her logical and practical approach to the research, we have designed some content objectives:

Objective 1: To identify the musical skills that the teacher teaching music and movement at the primary education should have;

Objective 2: To profile of initial teacher training for teaching music and movement in primary education;

Objective 3: To identify potential solutions to improve the teaching of the music and movement discipline in primary school.

The basic question in the proposed research is: What are the skills needed to teach music and movement at the primary cycle? In addition to this question, in order to outline the qualitative analysis, other reference questions are also asked:

- Are primary school teachers ready to teach the discipline of music and movement? What it can be done to improve their pre-service training?

- Is it appropriate to change the norm of the specialized teacher to teach the discipline of music and movement at the primary cycle?

In order to achieve the objectives and answer the questions formulated above, a mixed research design was considered: quantitative data were collected from the teachers teaching music in primary education, and qualitative data was collected from experts involved in training, guiding, monitoring and evaluating

them. In this paper is presented the data of the qualitative investigative design, aiming to gather in a more detailed way the strong points and the limits of training teachers for teaching music in primary education, as well as ameliorative solutions.

III.2. Participants

The interview was conducted with 19 respondents: University professors specialized in general pedagogy, didactics and musical methodology, inspectors specialized in arts and inspectors for the primary school, Methodist teachers from the primary school and music education teachers, experienced conductors and teachers who hold a certain position in the field of education. The 19 respondents were contacted through a direct approach, with a brief presentation about what they intend to achieve through this study, and subsequently received the interview guide. There were also telephone conversations with some respondents

The 19 participants, have different background and expertise:

a) In teaching music at advance level, in musical institutions in the country: National University of music in Bucharest / Faculty of composition, Musicology and music pedagogy / Department of training of teaching staff; West University of Timisoara, Faculty of music / Faculty of Sociology and psychology, Department of training of teaching staff; George Enescu national University of Arts in Iasi; Gheorghe Dima national Academy of music in Cluj-Napoca; Transilvania University of Brasov/ Faculty of music; co-opted teachers from these institutions teach methodology and didactic of musical education.

b) Educational experts, from institutions representing the Department of Education Sciences: Alexandru Ioan Cuza University of Iaşi/Faculty of psychology and Education Sciences/ Department of teaching staff training; Ovidius University of Constanta/ Faculty of psychology and Education Sciences; Vasile Alecsandri University of Bacau/ Faculty of Letters/ Department of Sciences of the University of Bacau Education. All these teachers teach the methodology and didactics of musical education at the primary school, and some also teach general pedagogy.

c) Specialized inspectors and Methodists teachers in the music field: Timis County School Inspectorate, Caras-Severin County School Inspectorate, Dinu Lipatti National College of Arts, Save the Resita children.

d) Specialized inspectors and Methodists teachers in the field of teaching the primary cycle: Timisoara County School Inspectorate, Caras-Severin County School Inspectorate, Gymnasium School No. 6 from Timisoara, Gymnasium School No. 16 from Timisoara, Gymnasium School No. 27 from Timisoara.

e) Choir conductors from Madrigal Marin Constantin national Chamber Choir, Faculty of music and Theater in Timisoara.

III.3. Tools used in data collection and procedure

The research procedure chosen in this case was the method of the interview, literature from Romania and abroad was consulted, in order to identify the directions imposed by the States that have modern education systems, and then we developed questions to identify certain solutions for the education system in Romania.

The qualitative design is based on the semi-structured interview, with open answers, written narrative. This method of inquiry helps us to observe, to understand more unperturbed and to be able to draw conclusions on the chosen topic, based on the opinions of some expert respondents, specialists, who can issue certain relevant value judgments in relation to the topic of the paper. It is known in the literature as an exploratory, semi-structured and holistic method of research. With this tool, the research proposer pays more attention to the respondent, because the response it receives will give weight to the expert's opinion in shaping views on the proposed topic.

The questions I thought about for the interview would like to highlight aspects such as:

- the current necessary skills that a teacher who teaches a musical discipline must have;

- the benefits of an educational policy proposal and change that would enable music education teachers to teach at primary school;

What would be some important activities carried out during the primary cycle to develop students musically and meet the standards of other countries where children are already studying and approaching music from a different perspective (instrument study, modern practices, choir, etc.).

We also had phone conversations with some of the respondents. All questions were asked to everyone. Also, in the elaboration of the qualitative analysis, we coded the respondents according to: Initial family name, school level (university U/ pre-university P), specialty (music M / Education Sciences E), didactic function (teacher DPPD General Pedagogical training G/ Methodist or didactic D/ Inspector I/ President of the Association of teachers A/ conductor D).

criterion number	first and last name with initials	code generated
1.	B D	BPMI
2.	C D	CUMD
3.	C C	CUEG
4.	F A	FUMD
5.	G R	GUMD
6.	G S	GPEA
7.	L D	LPEI
8.	M N	MPED
9.	M A	MPED”
10.	M M	MUMD
11.	N M	NPED
12.	P E	PUMD”
13.	P A	PPMD
14.	P L	PUMD
15.	S D	SUMD
16.	T M	TPEI
17.	T C	TPMI
18.	U A	UPMD
19.	V P	VUMD

Note: In criterion no. 9 and 12 are the two ladies conductor

IV. Research results

In the following, we will present you the analysis of the data from a qualitative point of view, based on the three objectives pursued in this paper. Each objective is fulfilled by a question, in the approach of qualitative analysis all these data will be presented through tables, through which the analysis of the theme will be carried out.

Objective 1 – identify the current musical skills that the teacher who teaches music and movement at the primary cycle must possess

For qualitative analysis, I will use the question: What are the current necessary skills that a teacher who wants to teach music and movement should possess? The following table is generated from the responses of the 19 respondents who participated in the interview, for the qualitative approach. We structured the training of the specialist to teach this discipline in three clear directions: General skills, musical competences, specific approach to a vocational discipline and personal competencies, which are based on the development of the emotional intelligence that the teacher in the class should have.

Table 1. The current musical skills needed to teach music and movement

Skills	Classifications	Quotes from the interview with specialists
General skills	Basic knowledge in general and specialized methodology and didactics	- the ability to build interactive didactic approaches and adapt didactic strategies to content; use of regulating school documents in the spirit of the didactic principles applied in the respective specialty; possession and application/dissemination of critical thinking about musical creations, having a reflective attitude on music; demonstration of good interlocutor abilities with the student/class; The manifestation of capacities as promoter/integrator of cultural values in the local and national Community (TPEI). - operating with specialized knowledge in order to design, manage and organize music and movement lessons/ extracurricular activities with music content from the primary cycle; adopting an innovative professional and specific methodological behavior of the two stages – prenotation and musical notation; using knowledge to optimize the use of movement in the rendering of the structural elements of music; Adopt appropriate strategies to assess the musical performance of primary-cycle children (MUMD). - I think that in primary education, feedback would be needed. A more pronounced and perhaps more diversified assessment after each work task performed (TPMI). - a coherent vision of methodology theory and practice of teaching the discipline (FUMD). - to have methodical and psychopedagogical knowledge, with emphasis on information, skills, skills and abilities in the music field (BPMI).
	Psychological and psychopedagogical knowledge	- in the field of psychopedagogy and didactics of the specialty musical Education (CUMD). - the ability to share music and musical knowledge according to children's age and psychological characteristics. - communication and networking, methodological, evaluation and self-evaluation, psycho-social, Technical and technological (MPED). - any music teacher should know well the age characteristics of the children with whom he works, the physiological and the aptitudinal ones (SUMD).
	Teaching strategies applied in musical pedagogy	- the correct and expressive association of musical elements received and interpreted with movement, body percussion and various accompaniment elements (musical instruments, musical toys, sound objects, etc.) (FUMD).
	Digital skills	- he can learn and improve more effectively using musical instruments and, more recently, with the necessary equipment, through computer-assisted teaching strategies (computers, laptops, video projectors, projection screens,

Skills	Classifications	Quotes from the interview with specialists
		interactive whiteboards, Internet connection) to bring the stage to the classroom (MPED).
	Transversal skills	- teaching various harmonies, programs to the whole school, choral conducting, choreography (GPEA).
Musical skills, specific to teaching a vocational discipline	Specialized studies	- first of all, they must have specialized studies. Music is a distinct language with its own alphabet. Those who do not know the alphabet and the language of music cannot teach this discipline, no matter what it may be called. A primary school teacher does not have a musical training except in totally random cases. Just as foreign languages, Ed Physics and religion are taught by specialized teachers in the primary school, so musical Ed must be taught by a graduate of specialized studies (CUMD). - specialized Bachelor studies that can continue with Master's and even Doctorate (PUED). - specific skills and knowledge acquired through the study of music in university education (UPMD).
	Basic notions in music theory (musical hearing, rhythmic sense, musical memory)	- the teacher must have extensive specialized knowledge (music history, musical forms, folklore, musical education systems) (SUMD). - to know the basics of music theory, to know how to solfegize, to have musical culture to master thoroughly the methodology of music teaching. Also have musical hearing, rhythmic sense, musical memory (GUMD). - the right use of musical language elements (NPED). - thorough knowledge of the scientific contents of the discipline and proper and proper operation of specialized terminology (TPEI). - the correct and expressive interpretation of exercises, solfegies, songs with text, didactic games, dances recommended in school programs (FUMD). - the teacher must have an overview of the art of sound: musical theory, solfegiere, harmony, counterpoint, instrument theory, Musical forms, folklore, history of music, musical esthetics (MPED).
	Musical practice – vocal singing/ Choir/ repertoire	- suggestions for the repertoire of songs, dances and auditions" provided by the school curricula for preschool and primary school students (FUMD). - I think the applicative part must predominate (actual singing) in counterbalance to theoretical notions (TPMI). - to coordinate / conduct a choir, a mini orchestra, to coordinate musical theater plays, Concerts etc (MPED). - knowledge of a minimal repertoire of children's songs and ability to sing after a score (NPED).
	Study of an instrument	- specific skills acquired through the study of an Instrument (UPMD).

Skills	Classifications	Quotes from the interview with specialists
		- for those who do not help our voice, it has been very useful for us to learn to play a musical instrument. I studied the violin (MPED). - to play at least one musical instrument (MPED).
	Knowledge of modern musical education systems	-an extremely important element is the teaching translation, in order to remain in the area of musical terms, which implies the transformation of scientific content into information accessible to children. The theorization of lessons does not make sense, the child must always start from practicing music, then the theoretical notions will break out. Without a good knowledge of world-renowned music education systems (Orff, Dalcroze, Willems, Kodaly) it is difficult to conceive an effective musical Education lesson (SUMD).
	General culture in music	- a decent level of music culture (NPED). - have a general musical culture (GUMD).
Personal/ professional skills	Attitudes: empathy, adaptability, respect	-empathy, communication, consistency, adaptability, respect (UPMD). - I think empathy should be an essential component of the teacher. We know that teaching involves training students. The teacher should not only inform but adapt this information to the thought system of the educable in the primary cycle, make this information assimilable (TPMI). - To understand childhood, beauty and tenderness of this age, to be empathetic and permissive, to be inventive and spontaneous, to perform musically exemplary (CUEG).
	Interpersonal skills	-patience, insight, engagement, dedication (GPEA).
	Organizational/leadership skills	-the ability to keep students' attention in class, in a band, in an orchestra (GPEA).
	Reativity	-the application of modern theories on the development of musical creativity in school children (MUED).
	Didactic improvement	-continuous and constant improvement (UPMD).

From the answers received, analyzing and encoding the texts, as can be seen, each category has several classifications.

General competencies include Basic knowledge in general and specialized methodology and didactics, psychological and psychopedagogical knowledge, modern teaching strategies applied in musical pedagogy, digital skills and transversal competences. Most respondents put a special emphasis on training in general and specialized methodology and didactics, as a basis in developing general skills for a teacher who wants to teach such a discipline.

In order to develop musical skills, some respondents consider that specialized studies in the field of music are needed, through which the teacher will acquire basic notions in music theory, will have the opportunity to do

musical practice and develop his singing with the voice, to make the choir ensemble, learn an instrument, learn through pedagogical practice about the modern musical systems to be applied in the classes, and develop the musical culture so necessary to better understand the musical phenomenon.

In addition to the two important competences, respondents also consider that personal or professional skills are needed in the current education system. In this category we need attitudes (empathy is the attitude that some of the respondents emphasized or emphasized in the received text considering it to be very important), interpersonal skills, organizational and leadership skills (class management), it requires a creative spirit and the teacher's desire to be always in step with development by participating in refresher courses.

By analyzing the answers of the specialists, we were able to find out what are the current competencies that a teacher who wants to teach music education should have. Also, these competencies are given by specialists who have developed in the Romanian culture, and the actuality of these competences are related to the development of our society and the national cultural and value context.

Perhaps some of you may wonder why a competent teacher profile is needed, because there are educational institutions that give directions for initial teacher training to teach this discipline. Of course, there are also such institutions, but I think it is necessary to have such a profile given by specialists in two fields, both music and pedagogy, education sciences, and in this context, the correlations of practitioners are supported by specialists, university professors.

Objective 2: Profile of initial teacher training from primary school for teaching the subject of music and movement

To achieve this goal, I start the research from the question: Are primary school teachers ready to teach the discipline of music and movement?

When we talk about the initial training of teachers who teach music education at the primary school, we refer to the training either from pedagogical high schools or one-semester training (in most cases) from the departments of educational Sciences within the Romanian universities.

The specialists of the qualitative study targeted some clear areas of acute needs met in this category of teachers, through which I have developed a profile of this initial training.

Starting from the question: Are primary school teachers ready to teach the discipline of music and movement?, we will discover some essential valences that require increased attention for their future training in accredited and responsible institutions.

Looking at the qualitative data, we deduced two important categories: Respondents who claim that teachers for primary school are well trained in pedagogical high schools and in the specialization pedagogy of primary and preschool education and most respondents who believe that teachers for primary school are not trained to teach the discipline of music and movement in current pedagogical high schools and the specialization pedagogy of teaching Primary and preschool, and thus by supporting their point of view, we have issued some classifications/areas of interest in their formation.

Table 2. Profile of primary school teacher training in teaching musical education

Skills	Classifications	Quotes from the interview with specialists
Yeah, they're ready	Graduates from Pedagogical High schools	- those who study it in pedagogical high schools yes, so it would be desirable that the students from PIPP graduated from pedagogical high school. It is about many hours of music study (2 years), then at least one year of methodology, observational practice and teaching (4 years) quite consistent in the pedagogical high school, which may be the basis for further training in the faculty (LPEI). - teachers who have graduated from a pedagogical high school are certainly ready to teach this discipline, given that to enter a pedagogical high school it is necessary to promote the aptitude test, and the framework plan, Specific to pedagogical high schools, it provides classes of musical theory and classes of musical practice in all five years of study (TPEI) - the initial training of teachers in pedagogical high schools, during the period which included the study of a musical instrument, was a higher training than the one now (MPED). - the graduates of the pedagogical high schools are, in most cases, prepare to teach this discipline (NPED).
	Graduates of the primary and preschool Education pedagogy specialization	-yes. The discipline is completed in the third semester I-II. In The Years I-II I go through the disciplines in the field and specialty (early Education, primary and preschool Education pedagogy, Theory and methodology of instruction, Theory and methodology of evaluation, Game Psychopedagogy, etc.), carries out observational practice and in the third year (all year) carries out lessons in the school under the coordination of practice mentors. Specialized training is completed with optional choral and guided assembly hours (MUED).
They're not ready to teach music education	You cannot develop the skills necessary for teaching a vocational discipline	- the training period is very short and, we all know that music, being a vocational field, requires, besides a generous time dedicated to study and practice, numerous aptitudinal conditions to ensure a favorable context for learning for the little ones (SUMD). - music is studied very little today both in pedagogical high school, as well as in the pedagogical university system. These students cannot assimilate and understand the amount of information, the formation of internal hearing, the rhythmic-melodic sense, the interpretive and informational experience that underlie a music graduate who begins the study of music, at best, At 7 years' (SMB).

Skills	Classifications	Quotes from the interview with specialists
		- the training of teachers in the primary school is a superficial one in the artistic field. They focus on important subjects (Romanian, mathematics, sciences), skills and abilities are limited due to genetic inheritance (some have artistic skills, but others have skills for real or human subjects) (PUED). - I think they are not sufficiently trained by the PIPP license, they remain somewhat generalists in the field of music education, given that during their studies they do not receive adequate and focused training on music education (CUEG). - PIPP graduates are not ready, nor would they be after a semester. - a single semester of study in college is not enough to teach this discipline. Also, in the current pedagogical high schools the study of music is almost non-existent (UPMD). - this is easy to see: A simple question asked to most fifth graders about what they did at musical Ed in grades 0-IV brings a simple and categorical answer: NOTHING (CUMD).
	The methodology and didactics of teaching music according to the school curriculum are not realized	- no, because the Didactics of the specialty in the bachelor stage refers to the discipline of music Education, which implies different content and approaches (VPMD). - it is not enough to study the discipline only one semester in the faculty, and a thorough preparation is needed to be able to form the skills of the students in the primary cycle, according to the standards of the current school curriculum (TPEI). - unfortunately, in the faculties we do not study music, the methodology of teaching music from the prenotation stage and the notation in a consistent way, with concrete examples of application in the classroom, examples developed in some lesson simulations (GPEA). - the period of musical prenotation, Targeting the first three years of primary education, it is very important for the future musical training of students, as they must be exposed to learning situations that allow musical skills to be formed and then the addition of musical notation (in grades III-IV) based on the experience gained. Vocational disciplines such as visual arts, sports and music have always been better organized by those who are specialists in the field, regardless of the age segment approached (SUMD)
	They do not have the skills to prepare music	-the majority of these graduates are unable to perform satisfactory musical activities in pre-school and school education (FUMD).
	No instrument is being studied	-a few decades ago, the study of an instrument was included in the curriculum of pedagogical high schools (GUMD).
	There is not enough practice to teach the discipline of music and movement	- a few decades ago, in the curriculum of pedagogical high schools were included in addition to the methodology of music teaching and pedagogical practice (GUMD). - training teachers in this regard cannot be enough without a pedagogical practice in the classroom. In my experience, students focus on so-called "important" disciplines (MPED).

The initial training is deficient, as we have seen according to the qualitative analysis and in the institutions that form specialists, and this segment is responsible for the Ministry of Education through the programs that it imposes and which are applied according to the ARACIP and ARACIS standards, But the continuous training of teachers is responsible both the County School Inspectorate and the teaching Body House, which aims to generate and apply training programs for teachers. Also, a good training for the teachers in the primary school, as well as musical activities and festivals is supported by the Cantus Mundi national Program, a program affiliated to the Madrigal – Marin Constantin national Chamber Choir. These activities have been going on intensively for a long time (at least I have been participating for 4 years), but the training activities for teachers during the pandemic period have increased, through free webinars. All these resources that teachers can benefit from are free of charge.

As the table above shows, the specialists co-opted for this research argue that the initial training of primary school teachers who will teach music education is not done according to the specific skills that a teacher who teaches such a discipline must develop. Also, the profile of the initial training as shown in the attached table needs to make policy changes for primary school teachers to benefit from valuable and beneficial training in order to be able to perform activities and teach music.

We should reflect on this objective and those who are able to make decisions for education in Romania, to achieve it because education through music, as we demonstrated in the introduction of this Article, brings many benefits in the life of students, and they propagate in society at national level.

Objective 3 – identify potential solutions to improve the teaching of the music and movement discipline from the primary cycle

The solutions through educational policy proposals would be very many, but in order to achieve this objective, I would like to propose a major solution to modify at national level the norm of the teacher through which the specialized teacher to teach musical education at the primary school, As is the case in many countries in the European Union. I start the research to achieve the objective from the question: Is it appropriate to change the norm of the specialized teacher to teach the discipline of music and movement at the primary cycle?

This theme proposed by this objective was and continues to be a topic discussed and difficult to approach in view of the proposal for a legislative amendment through which the specialized teacher of music Ed. to teach the

discipline of music and movement in grades 0-4. In this regard, many questions are born, many fears, many aspects that must be balanced with the position or the number of hours for the teacher in the primary cycle. Why some subjects taught at primary school by a specialized teacher have been legally accepted for students to benefit from better support, and why music and movement (although some efforts have been made) still do not benefit from this support.

In view of solutions for this proposal, we analyzed the qualitative response of the specialists in education, either those from university or pre-university with a position capable of supporting a certain decision, and the result will be presented in the table below

Table 3. Guidelines on the modification of the teacher's norm in teaching the discipline of music and movement

Skills	Classifications	Quotes from the interview with specialists
The proposed amendment is appropriate	The training of the specialized teacher is superior	- we have the noble purpose of forming the audience of tomorrow, but for this it is important that we practice music ourselves, in order to better understand the complex musical phenomenon and to be present as often as possible at musical and cultural events. I certainly support the presence in small and large classes of music teachers. Specialized training, carried out over a much longer period of time, variety of approach to musical language elements through different musical disciplines, constant practice of music, understanding the musical phenomenon from the perspective of the performer, not just the listener. There are solid arguments why music Education classes in schools should be conducted by music teachers. Any vocational discipline must be taught by a specialist in the field (SUMD). -the answer can be none other than the desire that music can be taught at the primary school by a teacher with the necessary training for this discipline, and which cannot be replaced by the study of music for one or two semesters, at a distance, or worse, at no frequency or other variants unsuitable for studying this discipline (BPMI). - any discipline of education must be taught by people with serious studies in the field. This means a professional, 21st century education, aligned with the standards of the contemporary world. Teaching Ed musical by teachers without a minimum specialized training throws discipline into ridicule, widows' children of a field that today is, alongside sports, the main social phenomenon of humanity! Music is an industry and a way of life. It has extremely diverse areas and knowing them requires an authorized guide. The lack of knowledge of the great musical masterpieces, the lack of interest in the musical culture, brings us down to the level

Skills	Classifications	Quotes from the interview with specialists
		of the underdeveloped civilizations, not to the European level, which we so much want (CUMD). - yes, it should be modified so that the general teacher (teacher) can "give up" the music classes to the music teacher. I would opt for teaching by the music teacher because: He is a specialized teacher, endowed and with appropriate artistic skills; he would be dedicated to quality musical training; he would bring prestige to the school where he works also through extra-curricular artistic activities; he would strengthen professionalization in primary education; It would increase the formative character of Romanian education (CUEG). - it could be a much more effective solution. I believe that the level of teaching and learning music in pre-school and school education, It would be higher if music education were achieved by teachers who have completed a high-profile faculty (FUMD). - I consider it appropriate to change the teaching norm so that the music Ed. teacher can teach at the primary school (GUMD). - yes, I consider it appropriate to change the teaching norm so that the music Ed. teacher can teach at the primary school (UPMD). - it is appropriate to change the teaching norma so that music teachers can teach at primary school because in this way students can better assimilate information from small classes to understand it when they reach secondary and high school (PUED).
	The model of the primary-cycle disciplines to which a specialized teacher is already teaching	- just as the disciplines of physical Education, religion, foreign language are taught by specialists in the field, I consider it mandatory to reconsider the position of the music teacher and to give children more opportunities for their musical training, By the occupation of music and music and movement Education departments by music teachers (SUMD). - it is extremely important! There could be a whole field of information and vocation to join the disciplines taught by teachers at the primary cycle: Physical education and sport, religion, foreign languages, in the desire for real development of musical qualities in children (BPMI). - yes, looking one-sided and subjective, I consider it appropriate to change the teaching norm so that the music teacher can teach at the primary school. Just as other disciplines are carried out by teachers specialized in the discipline, music education should be carried out by a teacher specialized in music (TPMI).

Skills	Classifications	Quotes from the interview with specialists
	Changes in national legislation	- I think we need to go through national legislation (CUED). - I believe that such a change implies a broad process of modifying the framework plans at the level of primary education so that the teacher's teaching norm is not affected (TPEI).
	The specialized teacher should be trained in the methodology and didactics of teaching music according to the age of children	- the music teacher could come down and teach in third and fourth grades, only after prior training with pedagogical skills appropriate to the age group (GPEA). - those who deal with the methodology of teaching musical education and pedagogical practice are the teachers from the music conservatories in the country through the modules organized in 3. This system of initiation in methodology CANNOT BE SUPPLEMENTED by courses organized outside the national education system. Only after the requirements of methodology and pedagogical practice are changed in the conservative, could future music education teachers be prepared to teach in primary classes, especially for the first and second grades where we are talking about the musical prenotation period (PPMD).
The proposed amendment is not appropriate	It requires an integrated approach to the disciplines that only the teacher for the primary cycle can achieve	- I believe that the teacher is meant to train the multidisciplinary student, to transfer skills from one discipline to another. The discipline of music and movement has integral parts in the other disciplines, contributing to the acquisition of knowledge and skills in a more pleasant, attractive way. The knowledge of students by the teacher through this discipline is of major importance, especially in CP-II classes (GPEA). - the horizon of the disciplines is still looked at interdisciplinary because the way of teaching, organizing and planning instruction in the primary cycle is integrated. It produces an interrelationship of disciplines, so that it meets the development needs of students, helps to create connections between what students learn and their experiences (MUED). - the curriculum of the music and movement discipline is developed according to a new, competence-centered curriculum design model. The construction of the curriculum is carried out in such a way as to contribute to the development of the training profile of the student in the primary cycle. From the perspective of the study discipline, the orientation of the didactic approach starting from the competences allows to emphasize the purpose for which it is learned and the actional dimension in the formation of the student's personality. Music plays an important role in people's lives. There is almost no man who does not like music, who does not listen to music daily, whether willfully or involuntarily. At a young school age, musical activities form impressions, arouse interest in music, contribute to

Skills	Classifications	Quotes from the interview with specialists
		the formation of musical taste and stimulate the esthetic sense, imagination and creativity, developing children's musical hearing, rhythmic sense and musical memory. The harmonious movement that springs from the rhythm of children's songs fosters the development of a culture of movement. At this age, singing is closely related to movement, the two developing by mutual effect (TPEI).
	The specialized teacher does not have the necessary skills for teaching at the primary school from the psycho-pedagogical and didactic perspective	- changing the teacher's teaching norm cannot implicitly lead to a better understanding of musical art by students. This is conditioned by the competences of the teacher in relation to the curriculum provisions for the primary cycle (MUED). - not necessarily, because he's not always well prepared on the psychological development side of the little schoolboy, which can be a big impediment (LPEI).
	Specialization preschool and primary Education pedagogy to provide more pedagogical practice and specialized methodology and didactic classes	- the current solution is more appropriate, but with several hours of methodology of teaching music at PIPP, in the case of students who have not graduated from pedagogical high school. The Ministry of Education must invest more in the artistic development of pupils, in training teachers through pedagogical practice in a consistent way, rather than repair, resorting to emergency solutions to save the teachers' chairs of music. They are absolutely necessary in school and Community life and currently have too few hours in secondary and high school (LPEI). - no, no. I believe that it would be beneficial within the PIPP to take the training of future teachers much more seriously. PIPP should pay much more attention to psychology, pedagogy and methodical courses of the disciplines (not just music education) (NPED).
	The primary school teacher must remain on a teaching time basis	- the discipline of music and movement should enter into the didactic norm of the teacher/teacher for primary education, because he already has too few hours in the norm. According to the law, he must have 20 hours. It is discriminatory against teachers in middle school or high school who have mandatory 18 hours or against teachers/ teachers for pre-school education, who have in the norm 25 hours (PUMD).
A mix of the two variants is preferred	Provided that the teacher is qualified	- it would be desirable to teach music, the one that proves the best training, both scientific and methodological, thus representing a guarantee for each student to reach their maximum potential. This would imply a great autonomy of the school in recruiting human resources, which in the current system does not exist. I therefore opt for flexibility: If the music teacher is qualified, he can teach at the primary school, otherwise, the classes remain in the teacher's teaching norm (MPED).

Skills	Classifications	Quotes from the interview with specialists
	A collaboration between the primary school teacher and the music education teacher	- in an ideal education system, I would add, a mix in which the preschool and primary education teacher and the music education teacher would teach this discipline together, namely: The teacher of preschool and primary education pedagogy would teach the theoretical elements and the music education teacher would teach rhythmic elements, introductory elements of musical composition (even from the small classes, If you want to have pleasant surprises, have the primary school students sing you songs they made….I assure you will be amazed…), introductory elements of broadcasting and musical interpretation, small 1-2-voice vocal ensembles, Introduction to learning a musical Instrument (TPMI). - it is desirable, however, to have a close connection between the teacher/teacher for primary education and the music teacher, in carrying out choir activities, other educational activities musical workshops, studying an instrument, etc (LPEI). - I consider it appropriate that musical education classes, Respectively, music and movement should be made by teachers in collaboration with specialized teachers, taking into account the specific of the music and movement discipline provided in the framework plan at the primary cycle and the general and specific competences of the discipline (TPEI).
	Other activities that the specialized teacher should perform at the primary cycle	-the music teacher could be successfully involved in after-school activities, for example, if they were really carried out as after-school activities, not as baby-sitting masked (NPED).
	Teaching of the optionals in the third and fourth grades	- the best option would be, in my opinion, the possibility that the music Ed. teacher could teach at the primary school an optional discipline, included in the didactic norm. The curriculum should include more elements related to music culture (NPED).

According to the qualitative analysis, there were statements and answers that should be seen from the perspective of the competences that the teacher must possess and the benefits (listed in the literature in chapter 1) that children can develop if teaching this discipline will be done by a competent person, able to form musical skills to educators, taking into account the integration of these skills into a set of disciplines and differentiated learning activities.

We have ordered the answers of specialists in 3 segments:

a. It is appropriate to modify the proposed, by supporting a vision based on the training of the specialized teacher who is clearly superior, having already based on the model of the subjects from the primary cycle to which the specialized teacher teaches, and in order for the training to be complete, the specialized teacher must follow in the training institutions a didactic and methodical according to the age peculiarities of the children relative to the elements of musical language before musical notation.

b. It is not appropriate to change, because an integrated approach to the disciplines is needed, the specialized teacher does not have the necessary skills for teaching at the primary cycle from the psycho-pedagogical and didactic perspective, and the teacher for the primary cycle loses a number of hours of the basic norm. And some of the specialists argue that the primary school teacher should teach this discipline provided that more pedagogical practice and specialized teaching and methodology classes are offered at the PIPP specialization.

c. It is preferable to mix the two variants, that is, a collaboration between the teacher for the primary cycle and the teacher of the musical Ed. The teacher can teach the optionals in the third and fourth grade and carry out activities differently. This would bring many benefits and would add value to schools. Where there is no music teacher, some of the respondents opted for the teacher for the primary school to teach the discipline from the classroom and even in school to the secondary school, the primary condition being the qualification of the person for this vocational discipline.

V. Discussions

This study was conducted in the context of the need to improve teaching at the primary cycle of the discipline of music and movement, Taking into account the necessary skills that the teacher must possess and the specialist profile that would be most appropriate for this discipline to develop the skills necessary for the 4th grade graduate

We started from the purpose of the research by which we wanted to explore the opinion of the teachers of specialists in the field, regarding the necessary competences in teaching this subject with vocational specific and the extension with which they are covered in the practical-professional configuration of support of this discipline.

The results of the research related to the three objectives that I have pursued in this research are a solid foundation to be able to pronounce in future research directions in the field in which I specialize. By identifying the current

musical skills that the teacher who teaches music and movement at the primary cycle must possess, we structured the training of the specialist to teach this discipline in three directions of necessary skills: general skills, musical competencies, specific to the approach of a vocational discipline and personal competencies, which are based on personal development and emotional intelligence. Of course, these skills identified by qualitative analysis are not found in the initial training of the future teacher for primary teacher, according to the chart of the specialized discipline in music methodology, on the website of the Faculty of Sociology and psychology. Also, the curriculum does not correspond to the transmission of content that the school curriculum mentions in the achievement of specific competence, and of general ones after the completion of the study cycle.

If primary-school teachers are prepared to teach the discipline of music and movement, the research question on which objective 2 is based, we will discover certain essential valences that require increased attention for their future training in accredited and responsible institutions.

Through objective 3, we sought to identify potential solutions to improve the teaching of the music and movement discipline from the primary cycle, regarding the possibility of teaching this discipline by a specialized teacher, starting from the research question: If it is appropriate to change the norm of the specialized teacher to teach the discipline of music and movement at the primary cycle. The specialists in education considered that: It is appropriate to modify the proposed, by supporting a vision based on the training of the specialized teacher, which is clearly superior, having already based on the model of the subjects from the primary cycle to which the specialized teacher teaches. Others have argued that it is not appropriate to change, as an integrated approach to the disciplines is needed, and the teacher for the primary cycle loses a number of hours of the basic norm. However, in this context there were some of the specialists who preferred a mix between the two variants, that is, a collaboration between the teacher for the primary cycle and the teacher of music education. To be able to teach the optional in the 3rd and 4th grades and to carry out activities otherwise would already constitute a radical change based on progress and would also be a continuity for the acquisitions needed to start the secondary school cycle.

The results of the research I propose can be a solid basis from which other research can be carried out, because in the music field, on the issue already exposed, there is not much information. The issue of changing the teacher's teaching norm of music education has been exposed at national level through debates and petitions of support, but from a legislative point of view, nothing has changed.

In international literature, this issue has already been exposed and studied in China and other countries, and a number of legislative changes have been made through the results of those important studies. The specialist teacher is the one who teaches in most countries, even from the primary school, and the general teacher from the primary school collaborates in carrying out various musical activities with the specialist in the field. We are also among the countries in the European Union that give the fewest hours to music education at primary school, according to the meNET program (http://menet.mdw.ac.at) and the results reported by the digital platform presenting the music field at European level.

I would like this study to be a continuation of other specialized studies, which can present data by which our representatives in national power bodies, accept changes and recommendations for the good of children and not just look at the economic side by which these solutions can be supported.

The results of this study must be interpreted taking into account the limits of the research approach, I personally believe that it is also essential to increase the target group, including a greater number of specialists in pedagogy, in musical didactics, inspectors, experts in education and ONG s to support certain approaches.

VI. Conclusion

"Education is not preparation for life, but education is life itself," said the great American philosopher John Dowey, "it is time for us to get involved in changing something in the context of the hours we teach, in the proposals within the school unit where we operate", he said. At county level and even at national level through major educational policies, so that the national system in Romania will be a model for future generations of children, and the cultural-artistic example will be a landmark of the European Union. The famous artists bring fame to the country by climbing on the biggest stages of the world, being trained in the Romanian school of the 20th century. Now, it is our moment, and quality music education will produce changes in the behavior of our children today, having a positive influence in the future Romanian society.

Given solutions on this topic can be a landmark for those who want to implement in the classroom certain recommendations that can improve the act of teaching, but also the initial training of teachers to be teachers, to teach in the primary cycle and to form the soul of children from an early age.

Therefore, in the light of the above, the data obtained and the limits mentioned, we can argue that the present study is one of descriptive-analytical type, which manages to draw attention to the problem we want and offers a

series of relevant arguments, data and statistical results, correlational and holistic type, compared as the foundation of future research directions proposed for study.

I want to thank very much to Professor Doctor Simona Sava for the remarkable contribution she had in my training as an educational expert in Education Sciences, for her support and her expertise she gave me in order to understand better my scientific research.

BIBLIOGRAPHY

Allen, S. (2008). Consultanță muzicală în învățământul primar. *British Journal of Music Education,* 5, p. 217-240. http://journals.cambridge.org/abstract_S0265051700006641

Button, S. (2006). *The teaching of music in the primary school by the non-music specialist.* Cambridge University Press, 23:1, 23-38.

Campbell, S. (2013). Motivations, and methodology and implications. *Educational Neuroscience* (43), p.7-16.

Curtis, L., Fallin, J. (2014). Neuroeducation and Music. *National Association for Music Education,* p.51-56.

European Commission (2017). *National Reforms in School Education*. https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-46_en

Facts and Details Website (Japan, 2014). *School Curriculum in Japan*. http://factsanddetails.com/japan/cat23/sub150/item2789.html?fbclid=IwAR0HZAHqHSSOzSC3aLbJwovz2PRoisV2jKKnbl6vzSQ1_u5w2WV-tSM3ZHs

Hincu, I., Filip, O. (2018). *Educational experience in music education*. National Bibliometric Institute, volume II. p.151-154.

Klein, E. (2019). Music technology and *Future Work Skills 2020*: An employability mapping of Australian undergraduate music technology curriculum. *International Journal of Music Education.* Vol. 37(4) 636-653.

Letts, R. (2019). Music education in China. https://musictrust.com.au/loudmouth/music-education-in-china/

Locker, M. (2014). *This Is How Music Can Change Your Brain*. https://time.com/3634995/study-kids-engaged-music-class-for-benefits-northwestern/

Menehan, K. (2013). Singing and Healthy Children. https://www.chorusamerica.org/singers/singing-and-healthy-children

Monitor on Psychology (2018). Neural Encoding of Music. https://www.brainvolts.northwestern.edu/

ME: Music Education Network. *Music Education in Schools*. http://menet.mdw.ac.at/menetsite/english/topics.html?m=1&c=0&lang=en

STUDIA UBB PSYCHOL.-PAED., LXVII, 2, 2022, p. 163-174
(Recommended Citation)
DOI:10.24193/subbpsyped.2022.2.08

UNIVERSITY TEACHERS' SKILLS AND ROLES IN STUDENT CENTERED EDUCATION

Elena Ancuța SANTI[1], Gabriel GORGHIU[2*]

ABSTRACT. In academic education, according to the regulations imposed by the Bologna Process, the student is placed in the center of the educational process, fully considering the trainee interests for deepening the knowledge and taking into account the own personality, as autonomous and responsible citizen. This paradigm attributes to student an active role, becoming in this sense a partner for teacher in the fulfilment of own training and professional development. Based on constructivist theory, student-centered education emphasizes the understanding, building and reconstructing of knowledge experiences, experimentation, reflective approach related to teaching-learning process, involving also the adaptation of the teaching methods to learners' interests and needs, creativity and innovation. The relationship between teacher and student has multiple values, it is based on respect and trust, in order to achieve common goals. Feedback has an important and relevant role in optimizing the educational process.

In the current socio-economic and cultural context, amplified by the effects of the pandemic, the rate of school leaving becomes high, which implies the adoption of effective measures for students to benefit from support, help, counseling and guidance. In addition to their roles required by student-centered education, teachers must express more openness, flexibility, ability to adapt to online constraints and understand the students' needs.

The paper aims to identify the expectations that students have in relation to university teachers and to design a teacher's skills pattern in the actual context. For this purpose, 245 students from Valahia University of Targoviste, enrolled in the Teacher Training Department programs have been interviewed and asked to express their expectations, attitudes and perceptions about their teachers.

Keywords: teacher's skills; teacher's roles; student-centered learning; students' perception.

[1] Lecturer, PhD, Valahia University of Targoviste, Romania. E-mail: santi.anca@yahoo.ro
[2] Professor, PhD, Valahia University of Targoviste, Romania. E-mail: ggorghiu@gmail.com
* Corresponding author: ggorghiu@gmail.com

ZUSAMMENFASSUNG. In Anbetracht der Vertiefung des Wissens des Auszubildenden und unter voller Berücksichtigung der eigenen Persönlichkeit als autonomer und verantwortungsbewusster Bürger steht in der akademischen Ausbildung, gemäß den Vorschriften des Bologna-Prozesses, der Studierende im Mittelpunkt des Bildungsprozesses. Dieses Paradigma weist den Studierenden eine aktive Rolle zu und macht sie in diesem Sinne zu einem Partner des Lehrers für die Erfüllung der eigenen Ausbildung und beruflichen Entwicklung. Auf der Grundlage der konstruktivistischen Theorie betont die studentenzentrierte Bildung das Verstehen, den Aufbau und die Rekonstruktion von Wissenserfahrungen, das Experimentieren und den reflexiven Ansatz im Zusammenhang mit dem Lehr-Lern-Prozess, der auch die Anpassung der Lehrmethoden an die Interessen und Bedürfnisse der Lernenden, Kreativität und Innovation beinhalten. Die Beziehung zwischen Lehrkraft und Studierende hat mehrere Werte, sie basiert auf Respekt und Vertrauen, um gemeinsame Ziele zu erreichen. Das Feedback spielt eine wichtige und relevante Rolle bei der Optimierung des Bildungsprozesses.

Im gegenwärtigen sozioökonomischen und kulturellen Kontext, der durch die Auswirkungen der Pandemie noch verstärkt wird, ist die Schulabbrecherquote hoch, so dass wirksame Maßnahmen ergriffen werden müssen, damit Studierende von Unterstützung, Hilfe, Beratung und Anleitung profitieren können. Zusätzlich zu ihrer Rolle, die die studentenzentrierte Bildung erfordert, müssen die Lehrerkräfte mehr Offenheit, Flexibilität und die Fähigkeit, sich an die Online-Zwänge anzupassen und die Bedürfnisse der Studierende zu verstehen, zeigen.

Das Papier zielt darauf ab, die Erwartungen zu identifizieren, die Studierende in Bezug auf Hochschullehrkräfte haben, und ein Kompetenzmuster der Lehrkraft im aktuellen Kontext zu entwerfen. Zu diesem Zweck wurden 245 Studierende der Valahia-Universität aus Targoviste, die in den Programmen für die Lehrerausbildung eingeschrieben sind, befragt und gebeten, ihre Erwartungen, Einstellungen und Wahrnehmungen gegenüber ihren Lehrkräften zu äußern.

Schlüsselwörter: Fähigkeiten der Lehrkraft; Rolle der Lehrkraft; studentenzentriertes Lernen; Wahrnehmung der Studierenden.

1. Introduction

Nowadays, for the young people, one of the main challenges is to acquire a set of complex skills which should ensure adaptation to the requirements and changes met in the labor market, in all the fields. In this respect, not only valuable basic communication skills (such as reading and speaking) are sufficient, but also listening and collaborating skills, together with processing information from multiple perspectives are strongly requested. The capacity to recognize and even create relationships between the novelty and various inputs of different information is rewarded in this new century (Gordon et al., 2012, p. 4).

As a directional educational paradigm, the student-centered learning aims at acquiring some competences and practices which enable independent, autonomous and creative development of the personality, formation of an individual who should be able to solve problems and learn throughout their life (Young & Paterson, 2007, p. 5). In this process, the student is the actor responsible for the learning process, whereas the teacher fulfils multiple roles and therefore creates various contexts and effective opportunities to produce and facilitate learning, to stimulate interest and develop motivation. The accent focuses on the student, around whom the instructive-educative endeavors are built, so that they become interested, motivated, capable, passionate and responsible in their own evolution.

2. Theoretical concepts: student-centered learning

The paradigm of student-centered learning is based on the *constructivist* learning theory according to which the ones who learn should build and rebuild their own knowledge in order to learn efficiently. This educational model derives from the pedagogic conception of several theoreticians such as Hayward (1905), Dewey (1956), Piaget or Rogers (Attard et al., 2010, p. 4), the idea finding its origins in the paper *Emile, or on Education*, by J.-J. Rousseau (Cristea, 2008).

Following the Bologna Declaration signed in 1999, a series of objectives aimed to ensure on raising the quality in education, among which the student-centered learning became a priority in higher education.

The student-centered learning may be regarded from multiple perspectives: as paradigm with a major impact on exploitation of human resources, and increasing the quality of the activity carried out; as ethical and deontological position consisting in valorizing the learning subjects; as strategic option based on the capacity of the learning subject in the educative process, and as method to approach the instructive-educative process based on the needs, interests, aspirations and potential of the learning subject (active strategy) (Șoitu, & Cherciu, 2006, p. 58).

The student-centered learning is focusing on the educational needs of the student, and imposes on teacher several roles to be assumed: learning *facilitator*, *creator and organizer* of authentic learning contexts which should determine the student to go from the stance of passive actor to the one of an active individual, who gets involved in the process of own development, *counselor*, *guide*, *moderator*, *planner*, resource *manager*, *evaluator* (Todorescu, 2009).

In addition, the teacher should exploit his/her psychological skills toward understanding the cognitive, emotional, skill-related characteristics of the students, in order to develop different responses to the latter's intellectual needs. Weimer (2002), cited in Jony (2016, p. 173) indicates the roles of teacher and student in the process of changing, according to the student-centered learning paradigm - the teacher shifts from *sage on the stage* to *guide on the side*, viewing the students not as empty vessels to be filled with knowledge, but as seekers to be guided along their intellectual developmental journey. Consequently, it emerges a partnership between teacher and student with a common goal, to form skills required to successfully integrate the individual on the labor market, both at national and European level.

In reference to higher education, the student-centered learning implies the following elements: flexibility and freedom in terms of time and learning structure; more teachers who are better trained, who strive to share knowledge with their students and who are responsible for helping the student to acquire skills; teachers' emphatic attitude, in order to understand students; harmonious hierarchical relationships within higher education establishments. Additionally, it represents a continuous process of improving the didactic demarches, based on a positive attitude of both teachers and students, who work together toward building a relation set up on respect, and interdependence, beneficial to both partners, enabling an active, authentic learning, and a profound understanding (Attard, Di Iorio, Geven, & Santa, 2010). In this approach, the student has a big personal and professional responsibility, together with an increased sense of autonomy. Those all imply a reflexive approach on the teaching-learning process, both for student and teacher (Lea et al., 2003), involving creativity, as well as good metacognitive skills.

The well-implemented student-centered learning generates real and visible benefits: high motivation for learning, better knowledge retention, more profound understanding and positive attitudes (Collins, & O'Brien, 2003), receptivity to what is new, independent, autonomous students who are confident in their own abilities, self-assessment capacity, critical thinking, interest in one's formation.

3. Methodology of research

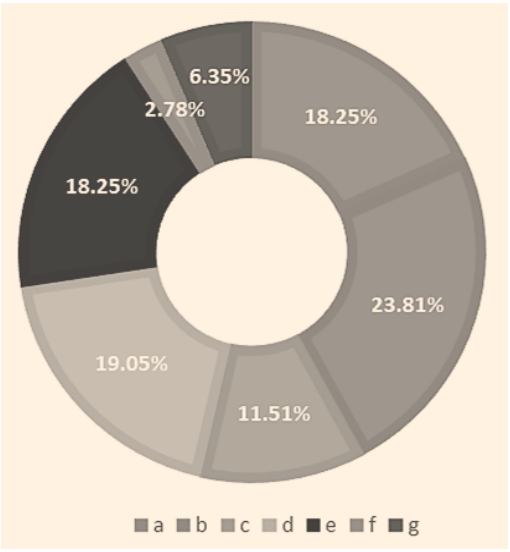
There is no secret related to the decreasing number of students who complete their university studies, in report to the number of students who started their studies, over the past years. This means that the academic staff has the major responsibility of identifying, at an early stage, the factors leading to studies

abandonment, and finding the best solutions, to minimize this phenomenon. The teacher's personality, the didactic style, the methods used, the way they relate to students, flexibility and capacity to understand and adapt better the student-centered learning, may be important factors in reducing the abandonment rate.

In this respect, the goal of the research was to identify the students' expectations, attitudes and perceptions of their own teachers and to outline a general profile of the teacher's skills, in the context of involving student-centered learning paradigm. The sample of the research was represented by 245 students, enrolled in the first academic year of studies, all of them from Valahia University of Targoviste, preparing to become teachers (psycho-pedagogical study program). The research exploited their feedback expressed in a specific questionnaire (Annex 1).

4. Results and discussions

In order to identify the students' perception in relation to the factors which ensure success in higher education, they were requested them to rank a series of given variables, considering a seven point Likert scale (from 1 - the most important, to 7 - the least important).



a. Teacher's professional skills
b. Teacher's socio-emotional skills
c. Teacher's psycho-pedagogical skills
d. Teaching-learning used methods
e. Ability to increase student's motivation
f. Teacher's assessment used methods
g. Others: *teacher's creativity, opportunities derived from the student's status, interest in one's own formation, rendering attractive courses, modern technology and equipment, students' skills, choice of suitable specialities, student-teacher relationship, obtaining some scholarships, desire to build a career, joy to learn, to know, to be a good specialist*.

Fig. 1. Factors on which academic success depend, in students' perception

As shown in figure 1, the results obtained indicate the fact that the respondents value - in a great measure - the teacher's *socio-emotional skills* (point *b*): understanding, communication, relating to others, knowing the others, empathy, adaptation etc. Moreover, the students attach a major importance to *methods used by teachers* (point *d*) and consider that they intercede and streamline the educational process. The following position in the respondents' choices is represented by the teachers' *professional skills* (point *a*) and also *students' motivation* (point *e*). The students ranked in last position the *assessment* as process (point *f*), which means one more negative perception on this component of the actual education, since assessment is seen as a sanction (in many cases), as a process which generates dissatisfaction, associated with negative feelings. The teacher - placing the student in the center of the educative demarche - should use other alternative assessment methods, as: works (themes) related to student's interests, portfolios, individual/group projects, or self-assessment / mutual assessment etc., minimizing therefore the negative perception on this important component of the instructive-educative process. The clear assessment criteria and transparency may also contribute to improving the perception of the students on assessment and increasing their motivation for learning.

In addition, there were defined several factors considered to be successful in school: teacher's creativity, opportunities derived from the student's status, interest for one's own formation, attractive courses, modern technology and equipment, students' skills, choice of the suitable specialty, teacher-student relationship, obtaining some scholarships, desire to build a career, joy to learn, to know, to be a good specialist.

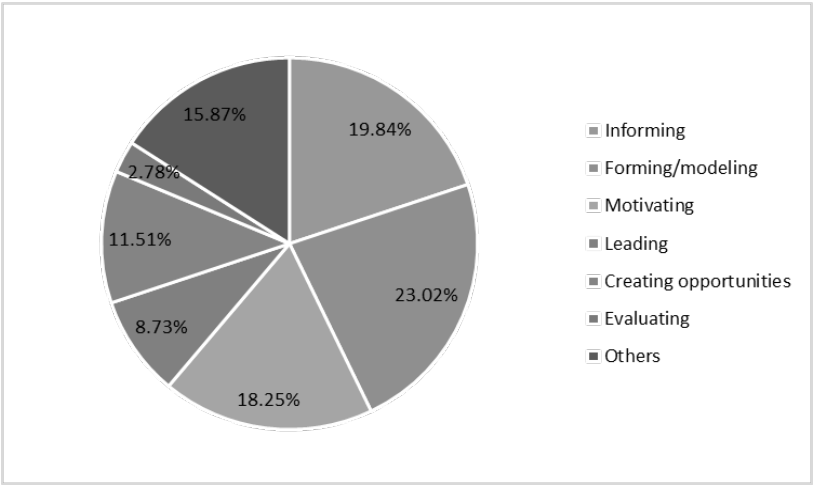


Fig. 2. Activities carried out by an efficient teacher in relation to students' expectations

In order to identify the students' expectations in relation to the activities carried out by an efficient teacher, we have requested them to rank a series of given variables on a seven point Likert scale (from 1 - the most important, to 7 - the least important). Therefore, figure 2 shows that most respondents appreciate that an efficient teacher *forms or shapes* the trainee's personality, fact which indicates appreciation and valorization of the didactic profession, as mission moving beyond the borders of the classic vision (teacher as a transmitter of knowledge) and attaches it a fundamental role in the process of human development. Shaping the personality represents an art, a special issue which implies vocation and requires high level skills on assuming the role of *shaper* (implying to be a model yourself…). This perception consolidates the need for student-centered learning.

In the second place, the students mentioned the *information*, which requires knowledge derived from knowing better the contains of particular discipline taught by the teacher, significant knowledge, large cultural universe, quality professional training. Then, in students' perception, *motivating* is also mentioned to be valorized by an efficient teacher.

The last position is filled by the assessment (again), which confirms the previous conclusion: i.e. assessment has negative valences in the students' vision.

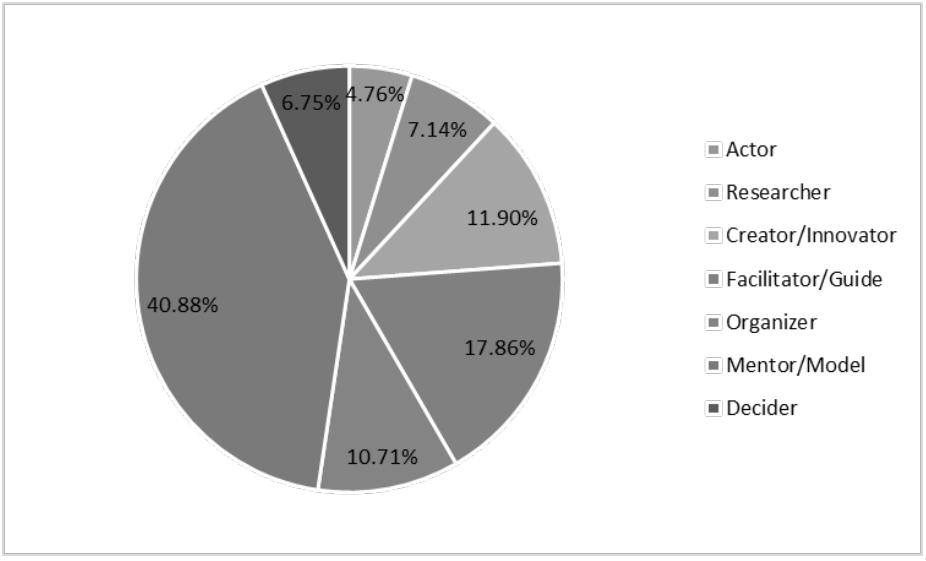


Fig. 3. Roles fulfilled by an efficient teacher in relation to students' perceptions and expectations

When requested to value (from 1 - the most important to 7 - the least important) the roles fulfilled by teachers (figure 3), the students appreciated first the teacher as *mentor* or *model*. Their choice indicates two aspects: students need models, values, standards in their lives. In addition, they have major expectations from their teachers - ethic, moral, civic etc. The second choice was oriented on *facilitator/guide*, which means that the teacher should know how to project the learning activity in the best format considering the necessary and useful knowledge related to a specific content; facilitating implies good knowledge and ability to transfer it to students, while guiding means subtly providing students with a direction, without cancelling the individual's creativity and initiative. The next choice directed the teacher as *creator/innovator*, receptive to newness, to changes, adapted also to changes.

The respondents ranked last the role as *actor* - which is associated mostly to "playing a role", or being a character. We consider that this choice expresses the need for something authentic, real, spontaneous, natural, in relation to the teacher.

5. Conclusions

There are many challenges associated to the status of student. Some of them relate to internal variables - students' perceptions and expectations, motivation, capacity to make the best decisions on one's own formation and career, knowledge, cognitive skills, adaptive possibilities and social skills. Nevertheless, there are also difficulties related to the external environment, organizing courses, timetable, specificity of teaching in higher education, didactic strategies and teaching style of academic staff - factors which may be altered in a way or need intervention.

The students' educational expectations represent important variables in this context, as they influence motivation, behavior and academic success. A holistic approach of the factors leading to success or, on the contrary, lack of success, school dropout etc. highlights the need to place the student in the center of the educational process. Knowing their needs, openness, involvement, building an authentic relationship between teachers and students, may constitute some footholds of the foundation that underlying their success. The students need support and additional academic guidance, especially in their first year of study.

In the above-considered analyze, the students' feedback indicates the following issues:

- the students express that teacher has an important status, role and special mission, closely connected to forming one's personality, character, values, development of life skills;

- the student-centered learning is absolutely necessary - its principles are in line with the student's profile in the actual society;

- it is required to foster positive approaches on learning;

- it is required to clarify the importance of the assessment and to improve the related process;

- it is necessary to provide more counseling and support.

All the above mentioned issues are in line with the recommendations formulated by the European Commission for Higher Education. Like stated for the teaching profession, "the EU teachers' and school leaders knowledge, skills and attitudes are seen as great importance, and their quality and professionalism direct impact on the students' learning outcomes" (European Education Area).

Implemented in such manner, the student-centered learning brings a series of benefits (Attard et al., 2010, p. 9), such as: increasing the quality of education, limiting the dropout ratios in higher education, attracting students, developing the lifelong learning culture and related skills, and in an indirect sense, valorizing the status of the academic staff.

REFERENCES

Attard, A., Di Iorio, E., Geven, K., & Santa, R. (2010). *Învățământul centrat pe student. Ghid pentru studenți, cadre didactice și instituții de învățământ superior.* [*Student centered leaning. Guide for students, teachers and higher education institutions*]. https://www.anosr.ro/wp-content/uploads/2012/07/2012-Toolkit-ICS-cadre-didactice1.pdf

Collins, J. W., & O'Brien, N. P. (Eds.). (2003). *Greenwood Dictionary of Education*. Westport, CT: Greenwood.

Cristea, S. (2008). Istoria gândirii pedagogice: Jean-Jacques Rousseau. [The history of pedagogical thinking: Jean-Jacques Rousseau]. *Studia Universitatis, 5*(15), 146-150. http://studiamsu.eu/wp-content/uploads/29-p146-150.pdf

Lea, S. J., Stephenson, D., & Troy, J. (2003). Higher Education Students' Attitudes to Student-Centred Learning: Beyond Educational Bulimia. *Studies in Higher Education*, *28*(3), 321-334.

Gordon, E. W., Gordon E. W., Aber, L., & Berliner, D. (2012). *Changing Paradigms for Education: From Filling Buckets to Lighting Fires to Cultivation of Intellective Competence*. Gordon Commission: Toronto. https://www.ets.org/Media/Research/pdf/gordon_gordon_berliner_aber_changing_paradigms_education.pdf

Jony, S. (2016). Student Centered Instruction for Interactive and Effective Teaching Learning: Perceptions of Teachers in Bangladesh. *International Journal of Advanced Research in Education & Technology (IJARET), 3*(3), 172-178. http://ijaret.com/wp-content/themes/felicity/issues/vol3issue3/mdsolaiman.pdf.

Șoitu, L., & Cherciu, R. D. (2006). *Strategii educaționale centrate pe elev*. [Educational strategies centered on students]. Buzău: Alpha MDN.

Todorescu, L. -L. (2009). Învățământul centrat pe student-reper principal al Procesului Bologna. [Student centered learning - main landmark of the Bologna Process]. *Buletinul AGIR*, *2-3*, 226-234. http://www.agir.ro/buletine/489.pdf.

Young, L. E., & Paterson, B. L. (2007). *Teaching nursing: Developing a student-centered learning environment*. Philadelphia, PA: Lippincott Williams & Wilkins.

*** European Education Area. Quality education and training for all. *The teaching professions*. https://education.ec.europa.eu/focus-topics/teachers-trainers-and-school-leaders/teaching-professions

Annex

We are interested in your views on the factors that determine the academic success, the activities that effective teachers perform and the roles associated with them. Please answer to the following items with honestly. We assure you that the data you provide will be kept confidential; your answers will only be processed for statistical purposes. Thank you!

1. Please, rank (from 1 - the most important to 7 - the least important) the factors on which academic success depends:

a. Teacher's professional skills	
b. Teacher's socio-emotional skills	
c. Teacher's psycho-pedagogical skills	
d. Teaching-learning used methods	
e. Ability to increase student's motivation	
f. Teacher's assessment used methods	
g. Others (please, mention!)	

2. Please, rank (from 1 - the most important to 7 - the least important) the activities that an efficient teacher performs effectively:

Informing	
Forming/ modeling	
Motivating	
Leading	
Creating opportunities	
Evaluating	
Others (please, mention!)	

3. Please, rank (from 1 - the most important to 7 - the least important) the roles fulfilled by an efficient teacher:

Actor	
Researcher	
Creator/ innovator	
Facilitator/ guide	
Organizer	
Mentor/ model	
Decider	