Realization of Future Teacher's Mental Space in the Process of Bite-Sized Learning

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Abstract: As there are contradictions in the digital technology: 1) a tool for professional growth and 2) a tool for imposing a prepared scenario of achieving success on the subject, ignoring the principle of environmental compliance, our study aims to substantiate and experimentally test the effectiveness of the model of realization of modern student's mental experience (factor in activating his systemic thinking and teleological competence). Moreover, the technology of programming as philosophizing in the BSL format is considered to be an element in the humanization of geeks culture in the situation of supposed technological singularity. In accordance with the goal, we have created a regression-correlation design for the study of the influence of the predictor variable (BSL) on the criterion variable (disclosure of mental experience). The conceptual idea of the author's model 'Flipped Class' is self-learning as creativity, which is realized in the didactics of performative action. The results of the tasks have revealed the relationships and differences in the implementation of indicators of students' mental experience of joint e-Learning and BSL, which are visualized in correlation galaxies for future clustering. They have confirmed the leading idea of our study: the disclosure of the re-sources inherent in human nature in the process of learning is the way for the relentless cognition of the sense of placement with a view to achieving dignity and making free choices in life.

Keywords: *bite-sized learning, mental-spatial concept, course design, didactics of performative action.*

Introduction

For many e-Learning specialists, bite-sized approach is the right choice, because it:

• improves psychological engagement of learners;

• helps to prevent the burnout;

• stimulates learners to process information accurately and thoughtfully;

• increases appeal to a millennial learner by 71%!

So, by introducing the approach to the bite-sized learning, we express the openness for the more modern alterations that have the potentiality to form our students' future.

But the whole goal of this efficient educational approach can be wasted if the given examples and contexts are too abstractive or remote from the student's environment. Therefore, to enable students to make the most of an innovative approach to learning, the lessons should be placed in appropriate scenarios and contexts (Yates et al., 2020).

Research Problem

The introduction of bite-sized learning (BSL) format in modern professional education involves the construction of an individual learning trajectory for each student. It is not simply a matter of individualization, which is carried out in the framework of teamwork, joint tasks and learning content. Recent didactic research (Filatova, 2015; Avramenko, 2020) reveals the potential for not only *personalization*, but also the *personification* of education, in which the key figure is a student who makes an independent conscious choice of goals and means of learning. His cognitive system – a system of individual intellectual resources, or mental experience – monitors the performance of tasks (in terms of compliance of actual efficiency with the expected) and includes control mechanisms aimed at minimizing possible differences. This interpretation draws attention to a key regularity that is not usually addressed in the resource approach*: **mental experience sets not only the upper but also the lower limit of the effectiveness of a person's cognitive attitude to the world** – on the principle – not Equality, but Equity (Gray, 2015). This has accounted for the peculiarities and nature of the reproduction of the content of the educational process in the individual consciousness.

Research Focus

To understand how to attract and engage your students in the context of hybridization of the educational process, you need to start thinking about how they are and what to do to provide them with a sense of their own identity, guessing (anticipating) their needs. However, it is extremely difficult for e-learning professionals to succeed if they do not have a basic understanding of what ***mental experience*** is, how this system works, and how to help a student implement it effectively.

Works (Osorina, 2017; Oakley et al., 2008; Shadrikova, 2007; Volkova, 2015) are devoted to the question of realization of mental experience in the context of intellectual potential of the person. According to these studies, mental experience includes:

• cognitive mental structures that enable implementation of 1) convergent ability (structural, combinatorial and procedural skills); 2) creativity (speed, originality, receptivity, metaphor); 3) ability to learn (implicit, explicit); 4) cognitive styles (among them – field independence, reflexivity, range width equivalence, cognitive complexity, abstract conceptualization and imaginative tolerance, ways of coding "archetypal" and semantic structures of the semantic sphere of the person);

• cognitive mental structures that provide the perception, storage and ordering of information; help to reproduce the stable aspects of subject's environment in his psyche (archetypal engrams, methods and schemes of their euphoria in the information field);

• metacognitive mental structures, which are responsible for involuntary and arbitrary self-regulation of the information transforming process; designed to control the state of individual intellectual resources, to correct intellectual activity (involuntary and arbitrary intellectual control, metacognitive awareness, open cognitive position);

• intentional (motivational) mental structures, which are the basis of individual selectivity of intellectual activity and participate in the formation of subjective criteria for choosing a particular subject area, the direction of finding solutions, sources of receiving and forms of information processing (beliefs and attitudes).

To uncover the student's mental resources, especially in the current emergency, researchers have shown the effectiveness of collaborative learning (Bozkurt, 2020; Chen et al., 2018; Cui and Zheng, 2018; Riggs, 2020), given that the student's sense of isolation is one of the recognized problems of e-learning (Mbukusa et al., 2017).

Factors for the implementation of these resources are: scaffolding strategies (Rebecca Alber; Jennifer Davis; BowmanMeghan Laslocky), assessment distance learning and feedback (Torrisi-Steele, 2020).

According to researchers, procedural scaffolds help students use the instruments and resources accessible to them, and conceptual scaffolds facilitate to prioritize key concepts. Strategic scaffolds encourage students to use alternate strategies for solving the problems. Instructional scaffolding is an interactive and mutual process between student and teacher, and in the context of distance learning it may include educational multidemonstrations; glossaries; auxiliary tips; headings; references to additional resources and exemplary task performance models (Delen et al., 2014). Some online courses release instructional materials according to the student's level (Lang, 2020). Metacognitive scaffolds guide mental processes, the development of self-regulation and self-assessment of metacognition of future professionals (Doo et al., 2020; Kim et al., 2019).

However, the authors of these studies focus exclusively on the development of thinking and cognitive activity of the student (his ability to operate with external and/or internal models of the problem situation in the context of classical *offline* education). Not only spiritual and phenomenological degrees of personal cognition and typology of intellect (Gardner, 2015), but also the experience of emotional, semantic (semasiological) reflection, valuable-motivational, operational and communicative experience, the experience of habitual activism have been left out of consideration. It doesn't just dissonant with the post-classical paradigm of education (focused on the individual-unique person in the space of "opposition without opposition"), but also justifies the "expediency" of gamification, the so-called "A creator" who seeks to bridge the gap between himself and the computer in the form of so-called *combined creativity* (Guzdial & Riedl, 2019) the "advantages" of which are considered to be a bricolage "design", "clustering" of world perception.

Purpose of the Study and Research Questions

Thus, the **purpose** of our study is to substantiate and experimentally test the effectiveness of the model of realization of modern student's mental experience in the BSL format. In accordance with the goal, we have created a regression-correlation design for the study of the influence of the predictor variable (BSL) on the criterion variable (disclosure of mental experience).

Research methodology

The choice of the confirmatory methodology of the conducted experimental research was conditioned by the content of the author's model of bite sized approbation, the conceptual idea of which was self-learning as creativity.
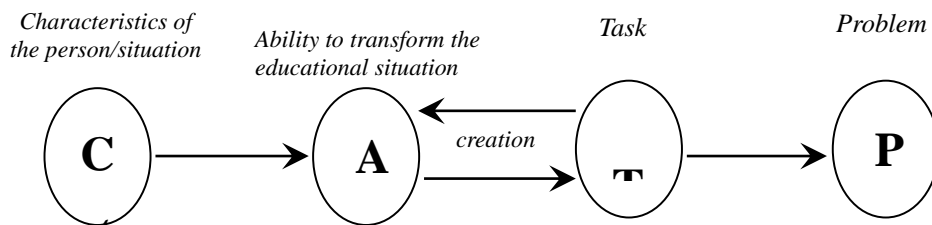

Fig. 1. *The author's model for self-learning as creativity*

The essence of the proposed model of performative didactics determines the interdependence between the phylogenetically underutilized human cognitive activity in the interrogation of truth and the level of realization of the person's ability to do that. The effect of this pattern is determined by the principles:

- realization of the freedom of choice of the individual educational trajectory;
- spiral-concentric search for epistemological landmarks;
- creative dialogue interaction;
- contemplation as spiritual improvement;
- improvisation as a way of unexpected and transformative organization of the learning process;
- paradoxicality as a conflict between the theoretical substantiation and the ontological existence of the modeled subject essence;
- intonation nature of human consciousness;
- eidetic and phenomenological reduction of value comprehension of educational content;
- orientation of the format of educational content on a given result and a clearly defined target audience;
- implementation of the facet approach in contextual learning as a performative act. (Romanova et a., 2020).

As a research hypothesis, we offer the expected result of the implementation of the modern student's mental experience (Table 1):

Table 1. *The expected result of the implementation of modern student's mental experience*

Components of mental experience	Experience resources	Techniques for its implementation
Cognitive experience	1. Ability to focus on relevant situations and, at the same time, to ignore irrelevant ones.	– technique «Fishbone»; – technique «Creating a cluster»
	2. Ability to use different methods of description and epistemological (allegorical, tropological and eschatological) analysis of phenomena	– creation of a reference scheme (collage) of the educational task
	3. Ability to differentiate the text and determine its essential meaning	use of mental maps: – spatial images – graphical systematizers (hierarchies, networks, matrices, block diagrams)
	4. Ability to plan own intellectual activity (its purpose and stages of implementation)	– strategies "I know, I want to know, I have learned in the process of work"; – creation of "Self-diagnostic notes" (Self Diagnostic learning logs)
Metacognitive experience	1. Ability to identify and formulate a range of questions on the subject of research	– questioning strategy «OIS»; – strategies for asking questions «KIAASE»
	2. Ability to formulate and substantiate hypotheses	– data interpretation strategy
	3. Ability to use erothematic methods, techniques of elentics, heuristics, synectics	– work with "conceptual schemes"
Intentional experience	1. Ability to aporia and disjunctive synthesis	– participation in cross-discussion
	2. Initiating a coach and co-learning environment	– discussion "joint search"; – strategy "design act"
	3. Ability to self-assess own intellectual activity	– technique "Focused dialectical notes in the fields"; – technique "Plus, minus, interesting"

The model of realization of modern student's mental experience in the BSL process was experimentally tested during the teaching of the course of pedagogical anthropology for future psychologists.

One training cycle lasted 16 weeks (4 modules). However, in the control group, training was conducted according to the traditional style of joint e-Learning (see Fig. 2), and in the experimental group –bite-sized teaching was used (see Fig. 3). In the traditional design of the course, each module provided a sequence: introductory topic → lecture (one hour)→ one hour of training exercises → one hour of practical tasks and, finally, summarizing. In the bite-sized course design, one module included three mini-lectures of 15-20 minutes each, a series of practical assignments in a virtual Error Lab and a final project. Tools were used to build the training programs: LMS and our own development – the learning management system Learn.
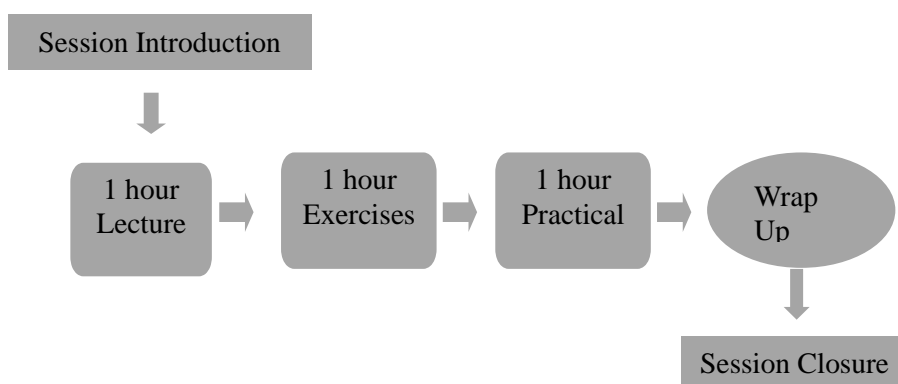

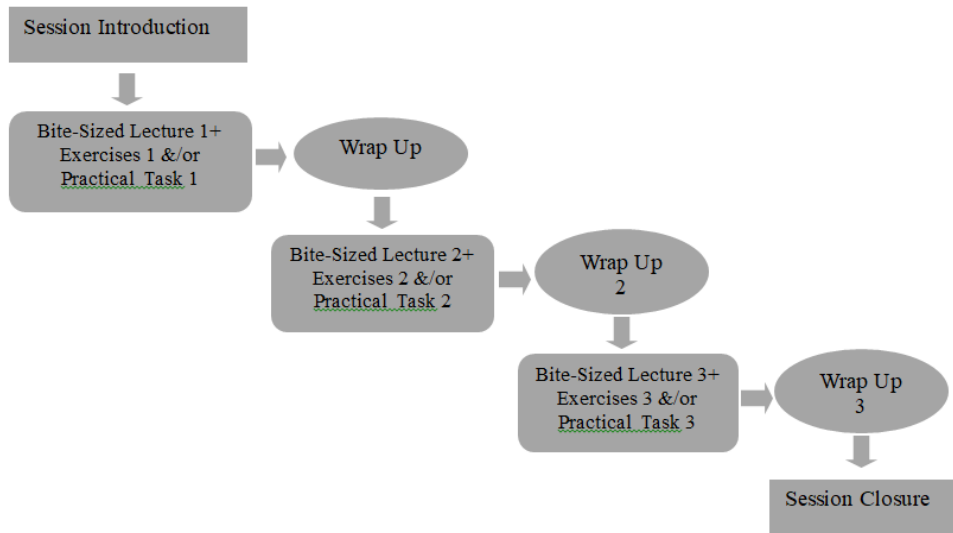**Fig. 2.** *Usual educational course design*

Fig. 3. *Bite-Sized course design*

The teacher-manager, activating her charisma, implemented the curriculum of the course on social platforms, transforming the tasks to the student's request. She used the detection strategies of the individual zone of proximal development (ZPD) of each learner – the so-called personification strategies (Eileen Raymond) and the corresponding humanitarian technologies of virtual reality using special software (such as CMS, LMS, SpringSuite) and web tools (such as CoSpaces Edu, MetaVerse, Panoform, ThingLink, Story Spheres.).

To prepare the final project successfully – classical (**Open-Ended Projects**) or "by inspiration" (**Passion Projects**) – students were involved in realization of **technologies:**

• art design coaching;

• functional excursion (**work based learning** (WBL)) (Nie, Armellini, Witthaus, & Barklamb, 2011);

• team teaching the problem (using video, audio; listening to podcasts, reading the blog).

Due to the limited ability to remotely convey the full range of emotions of each student and the emotional background of the group, which is so important for effective and full learning, we have used Training management system (TMS), where you can track the student's enthusiasm for learning.

Programs such as **Kahoot!, Google Forms, ClassKick, Socrative and EdPuzzle** have been used to formatively evaluate the results of bite-

size learning. Moreover, anonymous mutual evaluation of yearlings has been a particularly effective type of interaction.

General Information

To predict the influence of BSL on the disclosure of the mental experience (ME) of the student, we carried out a comparative analysis of the results of modular tasks – separately by students studying e-Learning technology and separately by students working in BSL format. Criteria variables were expert data and self-assessments of identified competencies:

• learning as creativity;
• constructing an individual learning trajectory based on personal experience;
• valuable-semantic transformation.

Sample

The sample consisted of 198 future psychologists: 103 students of joint e-Learning (hereinafter – control group, CG) and 95 students who studied by distance BSL (experimental group, EG). The experimental study was conducted on the basis of Ternopil Volodymyr Hnatiuk National Pedagogical University (n^1 = 95 people) and Khmelnytsky National University (n^2 = 103 people). The formative experiment lasted during 2019-2021 (3 training cycles).

Research Tools

To diagnose the student's mental experience, we used such methods as: "Self-actualization test" (SAT) (Aleshina et al., 2011), Multi-scale survey method "Behavioral self-regulation style" (BSS) (Morosanova, 2004), test-questionnaire of the level of subjective control (LSC) (Bazhin, 1993), D. McLean's questionnaire (Osin, 2010); 7-factor test "Self-regulation of mental experience in educational activities" (Kholodnaya, 2018); questionnaire "Relief of mental state" O. Prokhorov (Prohorov et al., 2020).

Procedure of Experimental Study

1. The effectiveness of the implementation of students' mental experience in the context of interactive digital education (CG), on the one hand, and the introduction of the BSL (EG) format, on the other hand, was evaluated according to the quality indicators:

• self-actualization,
• subjective control and self-realization,

• motivation to succeed in learning.

The content of each module of the course included four blocks of tasks designed for 4 levels of difficulty:

• the first level was characterized by cognitive simplicity (minimum of differentiation and integration);

• the second level was characterized by increasing differentiation and lack of integration of content, instability of judgments and uncertainty;

• the third level was characterized by moderate differentiation and integration of content, openness to new experiences, reflective self-esteem;

• the fourth level was characterized by a high level of differentiation and integration of content, which required flexibility and causality of thinking.

Based on the results of the completed tasks, we determined the levels of development of students' formalization, constructive and executive abilities:

2. Visualization of indicators of the studied characteristics of mental experience of students of joint e-Learning and BSL by means of the Graphviz program.

3. Cluster analysis and the selection of 3 clusters of students according to the level of the impact of different learning formats on realization of their mental experience.

Statistical analysis

Ideographic methods were used to study the products of epistemological creativity of an individual as a defining characteristic of his mental experience. Testing of the diagnostic complex was carried out using the computer program "INT". Methods of correlation analysis, cluster analysis (Average Linkage) and factor analysis (Analysis of principal components) were applied for the computational analysis of the results.

Research Outcomes

Table 2. *Comparison of indices of self-actualization level of students of joint e-Learning (control group) and BSL (experimental group), defined by SAT test:*

№ of scale	Name of scales	Maximum score	CG		EG		Significance of differences
			Points	%	Points	%	
1	Values	18	9,73	51,27	11,04	60.0	U =3186***
2	Chronemics	21	11,66	55,5	15,59	74,23	
3	Adaptive agility	25	11,82	47,3	16,28	65,1	U=3534***
4	Sensitivity	14	7,81	55,71	10,68	76,3	U =4031,6*
5	Immediacy	15	8,88	59,2	8,02	53,4	
6	Self-worth	22	10,77	49,0	14,31	65,0	U =3718**
7	Promoting 'self-correction'	8	4,14	51,7	5,05	63,1	
8	Person's worldview	17	8,75	51,5	10,17	59,8	U =3941,8*
9	The urge to be creative	21	10,22	48,7	14,48	68,9	U =4038,2*
10	Need for cognition	12	6,75	56,2	8,21	68,4	

Table 3. *Comparison of indices of subjective control level of students of joint e-Learning (control group) and BSL (experimental group), defined by LSC test:*

№ of scale	Name of scales	Maximum score	CG		EG		Significance of differences
			Points	%	Points	%	
1	Internality in the field of achievement	44	28,04	60,7	29,64	67,4	U =4130*
2	Frustration tolerance	12	8,52	71	8,67	72,3	
3	Sense of hierarchy	12	7,85	65,4	8,08	62,3	
4	Internality in the field of learning as creativity	10	5,96	59,6	6,49	64,9	U =3854*

Table 4. *Indicators of self-regulation of students of joint e-Learning (control group) and BSL (experimental group), defined by BSS test:*

№ of scale	Name of scales	Maximum score	CG		EG		Significance of differences
			Points	%	Points	%	
1	Programming	10	4,74	47,4	5,89	58,9	U=443,8*
2	Modelling	10	5,44	54.4	8,53	85,3	U=526,5*
3	Self-assessment	10	5,55	64,6	6,24	69,4	U= 412,5*
4	Self-sufficiency	10	5,68	56,8	7,95	79,5	U= 473,2*

Table 5. *Comparison of indices of the level of academic motivation and need for success achievement of students of joint e-Learning (control group) and BSL (experimental group), defined by 7-factor test "Self-regulation of mental experience in educational activities":*

№ of motives	Types of motives	CG		EG		Significance of differences
		Points	%	Points	%	
1	Motivation for achievement	3,19	63,8	3,23	64,6	"
2	Motives for avoiding failure	1,95	39	1,98	39	-
3	Perfectionism	3,40	51,12	3,26	48,37	3,40
4	Intrinsic of professionalism	4,14	74,65	4,53	80,24	4,14
5	Motivation for creative performance	2,68	72	3,54	78,1	U =9,136*
6	Learning and cognitive motives	2,60	63,6	3, 87	71,1	U =9,641*
7	Communicative motives	3,22	64,4	3,32	67,1	

Correlation analysis of 20 defining indicators of the characteristics of mental experience in the studied learning formats revealed almost the same level of correlation in the scales "Self-sufficiency": $r = 0,357$; p 0.001 and $r = 0.340$; p 0.001, "Values": $r = 0.314$; p 0.001 and $r = 0.318$; p 0.001, "Self-worth": $r = 0.355$; p 0.001 and $r = 0.318$; p 0.001, "The urge to be creative": $r = 0.203$; p 0.05 and $r = 0.226$; p 0.05. Significant correlations have been established between the Adaptive Agility scale and the scales on which EG and CG students differ: "Immediacy": $r = 0.285$; p 0.001 and $r = 0.422$; p 0,001, "Internality in the field of learning as creativity": $r = 0,301$; p 0.05 and $r = 0.209$, p 0.05, "Self-worth": $r = 0.355$; p 0.01 and $r = 0.244$; p 0.05. There are 5 significant correlations between the indicators of the scale "Self-worth" and the scales: "Adaptive agility": $r = 0,355$; p 0.001 and $r = 0.318$; p 0.001, "Self-sufficiency": $r = 0.308$; p 0.001 and $r = 0.267$; p 0,001, "Internality in the field of learning as creativity": $r = 0,292$; p 0.001 and $r =$

0.259; p 0.05, "Internality in the field of achievement": r = 0.27; p 0.01 and r = 0.25; p 0.01, "Modeling": r = 0.268; p 0.001 and r = 0.274; p 0,001. The results of the correlation show that students of the microlearning format have a higher level of individual disclosure of mental resources. This allows them to correctly specify the learning objective in accord with the current significant learning conditions, quickly understand the changing situation, and, according to the conditions, choose the program of executive learning activities or tactics of behavior with the teacher.

The calculation of the reliability characteristics of the evaluation of mental experience indicators based on the results of correlation analysis was performed using the Excel package (SPSS and R packages were used once to assess the magnitude of the design effect).

Below there is a visualization of the implementation levels of mental experience indicators in terms of CG (Fig. 4) and EG clusters (Fig. 5):
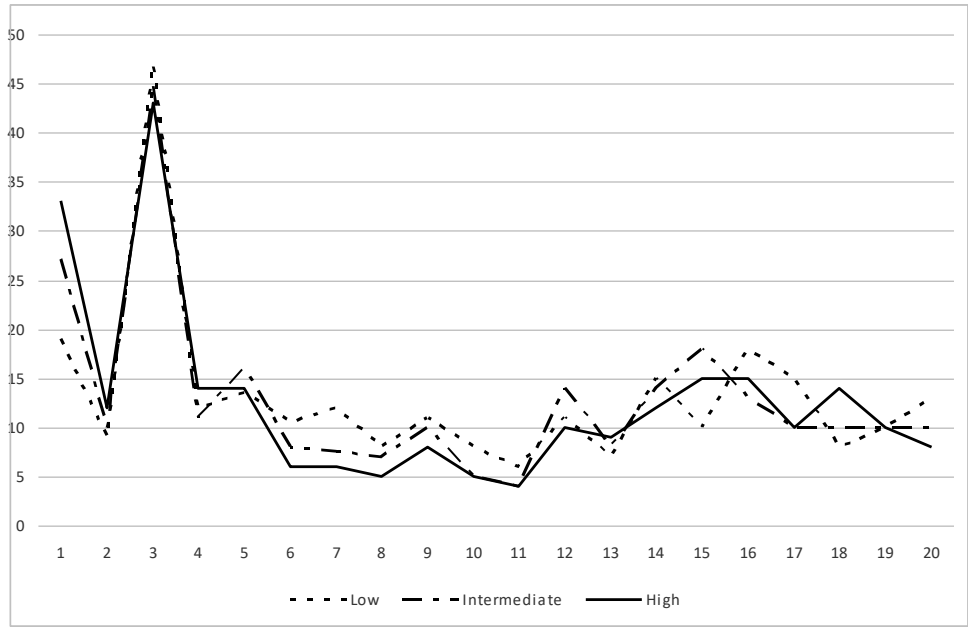

Fig. 4. *The level of implementation of indicators of mental experience of CG students (according to the results of cluster analysis)*

1. Values. 2. Chronemics. 3. Self-regulation (programming, modeling, self-assessment, self-sufficiency). 4. Sensitivity. 5. Adaptive agility. 6. Immediacy. 7. Self-worth. 8. Person's worldview. 9. Promoting "self-correction". 10. Frustration tolerance. 11. Motivation for achievement. 12.

Communicative motives. 13. Perfectionism. 14. Intrinsic of professionalism. 15. Sense of hierarchy. 16. Learning and cognitive motives. 17. Internality in the field of achievement. 18. Internality in the field of learning as creativity. 19. Motives for avoiding failure. 20. Motivation for creative performance.
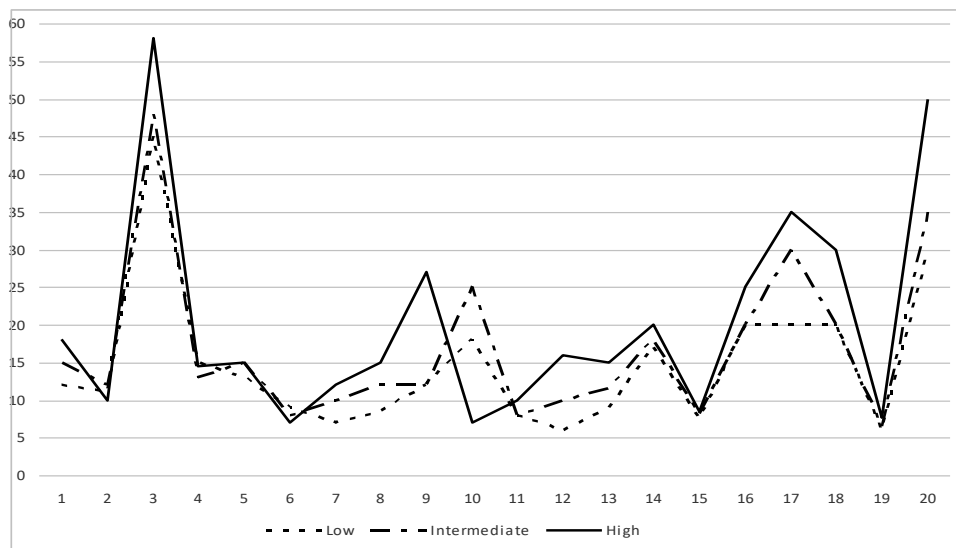

Fig. 5. *The level of implementation of indicators of mental experience of EG students (according to the results of cluster analysis)*

1. Values. 2. Chronemics. 3. Self-regulation (programming, modeling, self-assessment, self-sufficiency). 4. Sensitivity. 5. Adaptive agility. 6. Immediacy. 7. Self-worth. 8. Person's worldview. 9. Promoting "self-correction". 10. Frustration tolerance. 11. Motivation for achievement. 12. Communicative motives. 13. Perfectionism. 14. Intrinsic of professionalism. 15. Sense of hierarchy. 16. Learning and cognitive motives. 17. Internality in the field of achievement. 18. Internality in the field of learning as creativity. 19. Motives for avoiding failure. 20. Motivation for creative performance.

Discussion

The study has confirmed the opinion of paleo-neurologists that "the result of a long historical period of total conformism and social adaptation of man has been the process of his cerebral specialization, i.e. the displacement of creative and self-thinking individuals" (Savel'ev, 2014). The results of creative projects performed by CG students have shown that the consequence of the "terror of communication" is the motivation of a person

to gradually reorient to the inductive and collective nature of design thinking and displacing the student's research competence by collaborative iteration. The reason for this is the constant stay of the modern student in the hyper-information environment, and the constant use of audio-video content forces the central executive network of his brain to be in a state of excessive systematic activity. Therefore, energy does not enter the areas of the brain that are responsible for thinking. This conclusion has been reached by Marcus Raichle (2015), a neurologist at the University of Washington, and Ashley Chen (2013), a psychologist at Stanford University. Referring to their research, a famous Russian psychotherapist, Andrei Kurpatov (2021) concludes that the consequence of insufficient activation of modern students' mental apparatus is a problem with distal vision, i.e. the ability to begin designing concepts and ways of their implementation from the original purpose. That is why the typical strategy of creating a design project is now implemented by an algorithm: *idea → hypothesis → prototype → experiment → iteration.*

In an effort to correct this situation, we have tried to implement the author's model of self-learning as creativity in the BSL format. According to the results of EG respondents, it has proved to be effective in providing pedagogical conditions for the environmentally appropriate development of the student through learning in his own optimal mode of achieving success.

The chronological metro-rhythm of the thinking process, proposed by Gloria Mark, a professor of computer science at the University of California, has helped each student realize the genetic opportunity for arbitrary transitions from the observer to the thinker, as well as the ability to be permanently in the medial state between freedom of experience and its understanding. In addition, the introduction of the principles of didactics of performative action in a situation of reasonable limitation of digital tools has prompted the student to activate not only RAM (Dijksterhuis et al., 2006; Vegner & Uord, 2014), but also the euphoria of engrams. Peculiarities of students' behavior in BSL conditions, as well as the specifics of this learning format reflect the results of cluster analysis. Thus, the implementation of BSL, on one hand, provides a high level of independence, responsibility, self-control, and on the other hand, contributes to the realization of these qualities as characteristics of personalized mental experience. That is why EG students have higher indicators of self-actualization on 14 scales than CG students. And the significance of the difference $U = 4035.5 *$ (at $p < 0.05$ according to the U-Mann-Whitney test) in favor of the EG respondents on the scale "Perceptions of human nature" successfully correlates with the indicator "Learning and cognitive motives". However, the

last place of the indicator on the scale "Time orientation" among the data of CG respondents on 12 scales and the increase in the number of deviations from 6540.53 to 7612.93 indicate that students are more focused on the immediate success than on their future.

Conclusions

The developed course design of the BSL format, as the research has shown, has provoked a sufficient flow of events, acts of successful experience of future teachers in self-disclosure of the mental experience of the person. To help future students build their own trajectories of development, they have learned to identify and reflect in the data all the significant elements of these trajectories, to capture the digital footprint of human development. All this confirms the leading idea of our study: the disclosure of the resources inherent in human nature in the process of learning is the way for the relentless cognition of the sense of placement with a view to achieving dignity and making free choices in life.

The key to the introduction of author's technology BSL, as research has shown, is determined by the relationship "student – teacher" (as "traveler" – "companion"), because that is where education takes place as a spiritual transformation.

Implications, limitations and future directions

The emergence of BSL in professional training does not provide enough a psychologically, physiologically, pedagogically and methodologically sound balance between the realization of computer capabilities and live dialogic communication of the student as a developing person. This study is one of those that reveals the problem of contradictions in the technology as a powerful tool for professional growth and as an equally powerful obstacle in its path, which inevitably captures the finished scenario of achieving success. A promising continuation of the study is the creation of psychological and pedagogical theory of BSL, which can justify the implementation of processes (biological and social, conscious and unconscious, affect and intellect, rational and irrational) in human nature and allow future professionals to make free choices on the path to disclosure as a personality.

Acknowledgement

References

Aleshina, Yu.E., Gozman, L.Ya., Zagika, M.V., Kroz, M.V. (2011). Samoaktualiza-cionnyj test (CAT) [Self-actualization test (SAT)]. *Psihologiya. Perm [Psychology. Perm]*. Perm.

Avramenko, A.P. (2020). Individualizaciya processa formirovaniya inoyazychnoj leksicheskoj kompetencii na osnove mikroobucheniya [Individualization of the process of formation of foreign language lexical competence on the basis of microlearning]. *Vestnik Tambovskogo universiteta. Seriya: Gumanitarnye nauki. [Bulletin of the Tambov University. Series: Humanities]*. Tambov, 25(184), 25-34. https://doi.org/10.20310/1810-0201-2020-25-184-25-34

Bazhin, E.F. (1993). *Oprosnik urovnya sub"ektivnogo kontrolya (USK) [The questionnaire 'The level of subjective control' (USC).* Smysl.

Bozkurt, A., Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian Journal of Distance Education*, 15(1). Retrieved from https://www.asianjde.org/ojs/index.php/AsianJDE/article/view/447

Chen, Ashley C., Oathes, Desmond J., Chang, Catie, Bradley, Travis, Zhou. Zheng-Wei, Williams, Leanne M., Glover, Gary H., Deisseroth, Karl, Etkin, Amit (2013). Causal interactions between fronto-parietal central executive and default-mode networks in humans. *Proceedings of the National Academy of Sciences of the United States of America,* 110(49), 19944-9. https://doi.org/10.1073/pnas.1311772110

Chen, J., Wang, M., Kirschner, P.A. et al. (2018). The role of collaboration, computer use, learning environments, and supporting strategies in CSCL: A meta-analysis. *Review of Educational Research,* 88(6), 799–843. https://doi.org/10.3102/0034654318791584

Cui, P., & Zheng, L. (2018). A Meta-analysis of the Peer Evaluation Effects on Learning Achievements in Blended Learning Environment. In: Cheung, S.K.S., Kwok, L., Kubota. K., et al. (Eds.) *Blended Learning. Enhancing Learning Success.* Springer, pp. 227–237. https://doi.org/10.1007/978-3-319-94505-7_18

Delen, E., Liew, J., & Willson, V. (2014). Effects of interactivity and instructional scaffolding on learning: Self-regulation in online video-based environments. *Computers & Education, 78*, 312–320. https://doi.org/10.1016/j.compedu.2014.06.018

Dijksterhuis, A., Bos, M.W., Nordgren, L.F., & van Baaren, R.B. (2006). On making the right choice: The deliberation-without-attention effect. *Science,* 311, 1005-1007. https://doi.org/10.1126/science.1121629

Doo, M.Y., Bonk, C. & Heo, H. (2020). A meta-analysis of scaffolding effects in online learning in higher education. *The International Review of Research in Open and Distributed Learning,* 21(3), 60–80. https://doi.org/10.19173/irrodl.v21i3.4638

Filatova, M.N. (2015). Individualizaciya i personifikaciya dopolnitel'nogo obrazovaniya detej kak pedagogicheskaya problema [Individualization and personification of additional education for children as a pedagogical problem]. *Innovacionnye proekty i programmy v obrazovanii [Innovative projects and programs in education]*, 6, 13-21.

Gardner, G. (2015). *Myshlenie budushchego: pyat vidov intellekta vedushchikh k uspekhu v zhizni. [Thinking of the future: five types of intelligence leading to success in life].* Al'pina Pablisher.

Gray, Colin. (2015). Developing Effective Online Staff Development through Short, Regular, Bite-Sized Tasks. *Journal of Perspectives in Applied Academic Practice,* 3(1), 90–97.

Guzdial, Matthew & Riedl, Mark (2019). Combinets: Creativity via recombination of neural networks. *Proceedings of the 10th International Conference on Computational Creativity.* USA: ACCC. pp.180-187. ISBN:978-989-54160-1-1

Kholodnaya, M.A. (2016). Intelligence, Creativity, Learning Capability: Resource Approach (Development of V. N. Druzhinin's Ideas). *Social sciences,* 47(2), 80-94.

Kholodnaya, M.A. (2018). *Kognitivnaya psihologiya. Kognitivnyie stili: uchebnoe posobie dlya bakalavrov i magistraturyi. [Cognitive Psychology. Cognitive styles: tutorial for Bachelor and Master studies].* Izd-vo Yurayt.

Kim, J.Y., Lim, K.Y. (2019). Promoting learning in online, ill-structured problem solving: The effects of scaffolding type and metacognition level. *Computers & Education,* 138(1), 116–129.

Kurpatov, Andrej (2021, January 20). *O cifrovom autizme kak posledstvii samoizolyacii. [About digital autism as a consequence of self-isolation].* https://trends.rbc.ru/trends/social/5ea950dc9a7947246addeece

Lang, T. (2020). Online Undergraduate Students' Experiences of Teacher Presence: A Qualitative Descriptive Study. (Publication No. 28153912) [Doctoral dissertation, Grand Canyon University]. https://doi.org/10.13140/RG.2.2.23664.89602

Mbukusa, N. R., Kibuule, D., & Lates, J. (2017). Overcoming Barriers of Isolation in Distance Learning: Building a Collaborative Community in Learning. *Advances in Social Sciences Research Journal,* 4(17), 34-42. https://doi.org/10.14738/assrj.417.3478

Morosanova, V.I. (2004). *Oprosnik «Stil' samoregulyacii povedeniya» (SSPM): Rukovodstvo. [The questionnaire "the style of self-regulation of behavior (SSRB): A quide].* Kogito-Centr.

Nie, M., Armellini, A., Witthaus, G., & Barklamb, K. (2011). How do e-book readers enhance learning opportunities for distance work-based learners? *Research in learning Technology,* 19:1, 19-38. https://doi.org/10.1080/09687769.2010.548506

Oakley, T., Hougaard, A., Benjamins, J. (Eds.). (2008). *Mental spaces in discourse and interaction.* Amsterdam/Philadelphia.

Osin, E. N. (2010). Faktornaya struktura russkoyazychnoj versii shkal obshchej tolerantnosti k neopredelennosti D. Maklejna [Factor structure of the Russian version of the scales of general tolerance for uncertainty by D. MacLean]. *Psihologicheskaya diagnostika [Psychological diagnostics]*, 2, 65-86.

Osorina, M. V. (2017). Mental'nye prostranstva kak psihicheskaya real'nost' [Mental spaces as psychic reality]. *Vestnik SPbGU. Psihologiya i pedagogika [Bulletin of St. Petersburg State University. Psychology and pedagogy].* 7(1), 6–24. https://doi.org/10.21638/11701/spbu16.2017.101

Prohorov, A.O., Chernov, A.V. (2020). Funktsionalnyie sostoyaniya cheloveka: uchebnoe posobie [Functional states of a person: textbook]. Kazan: Izdatelstvo Kazanskogo universiteta.

Raichle. M. E. (2015).The Brain's Default Mode Network. *Annual Review of Neuroscience,* 38, 433-447. https://doi.org/10.1146/annurev-neuro-071013-014030

Riggs, S. (2020, April 15). Student-centered remote teaching: Lessons learned from online. education. *Educause Review.* https://er.educause.edu/blogs/2020/4/student-centered-remote-teaching-lessons-learned-from-online-education

Romanovska, L., Kondratska, L., Kravchyna, T., Bryndikov, Y., & Kozachenko, S. (2020). Epistemology of Metaculture Metaphorization. *Postmodern Openings*, *11*(1Sup1), 234-248. https://doi.org/10.18662/po/11.1sup1/132

Savel'ev, S. V. (2014). *Nishcheta mozga. [Poverty of the brain].* Vedi. ISBN 978-5-94624-044-4

Shadrikov, V.D. (2007). *Mental'noe razvitie cheloveka [Human mental development].* Aspekt Press.

Torrisi-Steele, G. (2020). Towards Realizing Twenty-First Century Skills: Deliberate Scaffolding of Metacognition in Instruction. *Multicultural Instructional Design* (pp.1243- 1245)

Vegner, D., Uord, A. (2014). Kak Internet menyaet nash mozg How the Internet is changing our brain]. *V mire nauki [In the world of science],* 2, 100-101. https://doi.org/10.4018/978-1-5225-9279-2.ch059

Volkova, E. V. (2015). *Tekhnologii razvitiya mental'nyh resursov [Technologies for the development of mental resources].* Izd-vo «Institut psihologii RAN».

Yates, A., Starkey L., Egerton, B. et al. (2020). High school students' experience of online learning during Covid-19: the influence of technology and pedagogy. *Technology, Pedagogy and Education,* 30(1), 59-73. https://doi.org/10.1080/1475939X.2020.1854337