# DISCURSIVE LEARNING OF STUDENTS IN TERMS OF POLYTASKING: RETROSPECTIVE ANALYSIS

*APRENDIZAGEM DISCURSIVA DE ALUNOS EM TERMOS POLITAREFAS: ANÁLISE RETROSPECTIVA*

*APRENDIZAJE DISCURSIVO DE ALUMNOS EN TÉRMINOS DE POLITASKING: ANÁLISIS RETROSPECTIVO*

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**ABSTRACT**: The article presents the results of the theoretical research on the issue of using the potential of discursive learning in the process of teaching students of the university in terms of specific polytasking. Possibilities of using discursive learning by structuring the educational material according to different forms of presentation (oral, written, problematic, non-verbal, indirect) have been emphasized. The model of hypothetical trajectories of discursive learning of a student of the university considering the features of polytasking has been developed based on the involvement of polytasking potential. The developed model specifies its target orientation (purpose, goal, expected result) and technological completeness. At the theoretical level, the stage-by-stage implementation of the model has been substantiated and the effects of its use in terms of the students' classroom and extracurricular activities have been determined.

**KEYWORDS**: Discursive learning. Polytasking. Student. University.

*RESUMO: O artigo apresenta os resultados da pesquisa teórica sobre a questão da utilização do potencial da aprendizagem discursiva no processo de ensino dos alunos da universidade em termos de politarefa específica. Enfatizaram-se possibilidades de utilização da aprendizagem discursiva por meio da estruturação do material didático segundo diferentes formas de apresentação (oral, escrita, problemática, não verbal, indireta). O modelo de trajetórias*

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*hipotéticas de aprendizagem discursiva de um aluno da universidade levando em consideração as características da politarefa foi desenvolvido com base no envolvimento do potencial de politarefa. O modelo desenvolvido especifica sua orientação (propósito, objetivo, resultado esperado) e completude tecnológica. No nível teórico, a implementação fase a fase do modelo foi substanciada e os efeitos de seu uso em termos de sala de aula e atividades extracurriculares dos alunos foram determinados.*

**PALAVRAS-CHAVE**: *Aprendizagem discursiva. Politarefa. Aluna. Universidade.*

**RESUMEN**: *El artículo presenta los resultados de la investigación teórica sobre el tema del aprovechamiento de las potencialidades del aprendizaje discursivo en el proceso de enseñar a los estudiantes de la universidad en términos de politareas específicas. Se ha enfatizado la posibilidad de utilizar el aprendizaje discursivo estructurando el material educativo según diferentes formas de presentación (oral, escrita, problemática, no verbal, indirecta). El modelo de trayectorias hipotéticas de aprendizaje discursivo de un alumno de la universidad teniendo en cuenta las características del politarea se ha desarrollado a partir de la implicación del potencial politarea. El modelo desarrollado especifica su orientación objetivo (propósito, meta, resultado esperado) y completitud tecnológica. A nivel teórico, se ha fundamentado la implementación etapa por etapa del modelo y se han determinado los efectos de su uso en el aula de los estudiantes y en las actividades extraescolares.*

**PALABRAS CLAVE**: *Aprendizaje discursivo. Politarea. Estudiante. Universidad.*

## Introduction

The future of our country depends on industry informatization, which will be provided by graduates of different specialties. The level of their professional competence, in particular, will prove their ability to work in terms of polytasking, discursiveness, and interactivity. Therefore, the implementation of the strategy of improving the quality of students' university education by attracting advanced information technologies is the key to successful professional development and state well-being. The popularity and effectiveness of students' discursive learning in terms of polytasking has been implemented in different countries. Currently, the objective necessity of involving the pedagogical potential of students' discursive learning in the process of domestic professional training requires substantive scientific coverage to outline the prospects of its use in terms of polytasking.

Nowadays, discursive learning is aimed at widening the boundaries of the subject-communicative space of educational interaction and forming the ability of students to work with text snippets on different media. Such educational reality will allow online grouping of the intellectual potential of the students, actualizes maintaining of interpersonal communication to solve the proposed tasks while avoiding the territorial barriers of spatial localization.

To create productive conditions for discursive learning, a modern higher school should provide the undergraduates with information resources from different subject areas to be used in terms of polytasking. The analysis of the implementation effectiveness of such training of students, who are both education- and science-focused, is becoming extremely relevant today. A modern student is a potential graduate. The latter due to his competence is operating in terms of polytasking of the national (active participation in the internal institutional process) and international (involvement in international programs of academic exchanges, internships, etc.) levels.

The unfortunate fact is that the modern domestic system of professional students' training is not focused on the use of the potential of discursive learning in terms of polytasking. This reflects the lack of students' skills and abilities to solve practical tasks in terms of the open information and educational environment, as well as the experience of their use in the future. The inconsistency of the students' training focuses on the search for the interconnection of the acquired knowledge, acquired skills, abilities, and experience of their use in terms of polytasking, which leads to a restriction of their competitiveness in the international labor market (ARSAWAN *et al.*, 2020).

**Literature review**

The relevance and timeliness of the chosen issue are confirmed by some foreign publications devoted to the analysis of the general impact of polytasking on the development of education; potential polytasking capabilities for homework; using websites to solve polytasking among US and European students automated task-switching performance in the system of polytasking; the complexity of adapting representatives of different generations to study in terms of polytasking; opportunities for using software in the discursive teaching of non-STEMM disciplines; the impact of discursive negotiations on the results of the scientific research.

Unfortunately, the problem of creating favorable conditions for the functioning of the open information and educational environment remains urgent for many modern higher educational establishments in Ukraine. In particular, this fact is confirmed by the statistics that the Ukrainian education sector remains 90% out of focus of informatization. In this regard, the pedagogical potential of discursive learning and polytasking is hardly used in terms of available students' educational training. Regarding urgent issues of academic reform, the need to deepen the tasks of educational informatization is being actualized. Within the framework of this task,

there is a possibility to promote the potential of discursive learning in terms of polytasking due to creating favorable conditions for more comfortable development of the open information and educational environment for «newcomers» and affirmation of the academic potential of available higher schools in the digital education spaces. However, the formulation of each task must be thematic, and the ways of the concept implementation clear and accessible. In this connection, a detailed analysis should be made of the conceptual and categorical apparatus of the research, the theoretical potential of the developed conceptual base, and the mechanism of introduction of discursive learning of students in terms of polytasking.

The purpose of the article is to carry out a systematic scientific analysis of the conceptual and categorical apparatus of the research, to uncover the theoretical potential of the developed conceptual base, to outline the mechanism for the introduction of discursive learning of students in terms of polytasking.

**Methods of the research**

To achieve the goal, the following scientific methods were used: *analysis and synthesis* – to consider the current standards and regulations on improving the professional training of specialists by creating a highly effective integral information and educational environment; *system analysis* – to analyze of the content of the concepts of discursive learning, polytasking, conditions of polytasking in the studies of foreign researchers; *systematization* – to consider the positive experience of using the pedagogical potential of discursive learning and polytasking abroad; *modeling* – to construct a conceptual model of hypothetical trajectories of discursive student's learning in terms of polytasking; *systematic and structural,* and *comparative and logical* – for the development of criteria of search for common and distinguishing features between the concepts of discursive learning and polytasking, structuring of the content filling of the forms of presentation; *benchmarking* – to outline the interconnection of information technology and learning with the development of discursive learning in terms of polytasking; *descriptive statistics* – to analyze the informatization index of the domestic education; *generalization* – to argue for the prospects of using the opportunities of discursive learning in terms of polytasking to increase the level of professional training of students of Ukrainian universities.

**Results and discussion**

«Discourse» is a relatively new scientific term but its logically centered ideology has been focused on by classical universities since past centuries. This term implied the need for a teacher to combine the theoretical presentation with specific examples (cases). In particular, since past centuries, such an approach of the teacher to his cause has been one of the priorities in the activities of the Faculty of Physics and Mathematics of the first classical universities in modern Ukraine. Educational activities at such faculties were built to meet the need of supporting the theoretical presentation with experimental polytasking. Regarding this, experimental offices and laboratories were opened at universities, which made it possible to combine the theoretical and practical, the verbal and visual.

In modern pedagogical circulation, the issue of discursive learning is under the focused attention of teachers, linguists, in particular. The probability of this idea can be substantiated with such features of discursive learning as high dynamism, social orientation, and quick results. Considering the social importance of students' professional training and, concurrently, the short period of their studies, attention should be paid to the possible ways of increasing the potential of polytasking in this process, which, combined with discursive learning could reduce the time to acquire knowledge and develop skills.

*Discursive learning* is the type of learning that is grounded on the basic empirical learning and aesthetic experience, not by modifying it but merely by supplementing it. Since discursive learning is based on experience, its fundamental construction is the transition from abstract to conceptual. The author emphasized the aesthetic experience to distinguish its constituent components – needs, views, emotions, and ideals.

The features of discursive learning are as follows: work with text snippets of applied content, high level of influence on the subject of cognition taking into account the educational situation, establishing a productive educational dialogue, systematic actualization of basic knowledge.

Foreign researchers have noted that discursive learning can create favorable conditions for the participants of this process to use verbal and non-verbal means of communication, to act as interlocutors, listeners, and observers.

Polytasking refers to the impact of multiple messages and images on the brain of the subject of cognition to teach the brain to work in the mode of super-fast actions and reactions. From a pedagogical point of view, the conditions are considered as a complete set of actions of the lecturers, focused on achieving the maximum performance of the educational process.

Foreign researchers propose to identify the phenomenon of polytasking with the environment of opportunities to perform completely different tasks, focused on the achievement of modern educational results.

To search for common and distinguishing features between the concepts of discursive learning and polytasking, the works of several foreign researchers were analyzed according to the following criteria. They were the use of an interdisciplinary approach (*A*); taking into account individual features (*B*); the leading role of the lecturer (*C*); formation of an individual educational trajectory (*D*); the use of information technologies (*E*) (Fig. 1).

The data of theoretical analysis showed that the weaknesses of discursive learning are the criteria *D* and *E* while at the level of polytasking they are on the contrary the strengths (Fig. 1). At the level of both categories of analysis, the role of the teacher is not dominant, but advisory, which reiterates the priority of cooperation between a teacher and a student on a parity basis (Fig. 1). Thus, the weaknesses of discursive learning (criteria *D* and *E*) can be reinforced by polytasking conditions (Fig. 1). Similarly, the weaknesses of polytasking (criterion *A*) can be "corrected" by the strengths of discursive learning (Fig. 1).

Concerning the above-mentioned features of discursive learning, we can assume that its effectiveness can be enhanced by creating appropriate conditions for polytasking (Fig. 2). With the help of modern information technologies and teaching tools, the teacher can acquaint the student with the scientific facts of different subject areas, while adhering to intra-industry and inter-industry teaching (interdisciplinary approach) (Fig. 2).

**Figure 1.** Analysis of the content of the concepts of discursive learning and conditions of polytasking in the works of foreign researchers
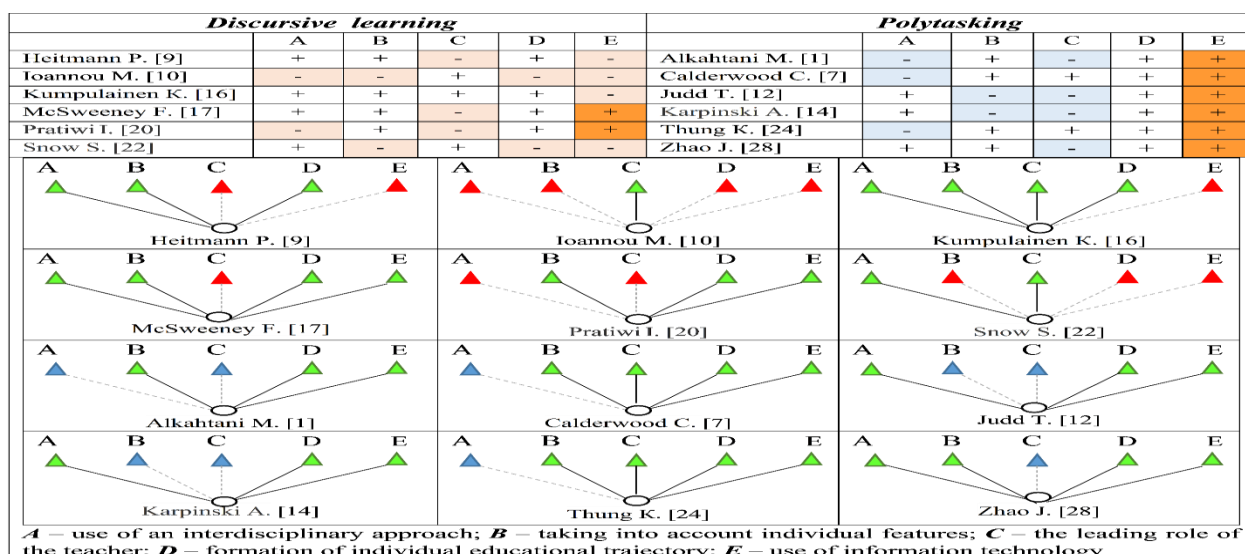


Source: Devised by the authors

**Figure 2.** The dominant influence of information technology and learning tools on the development of discursive learning in terms of polytasking
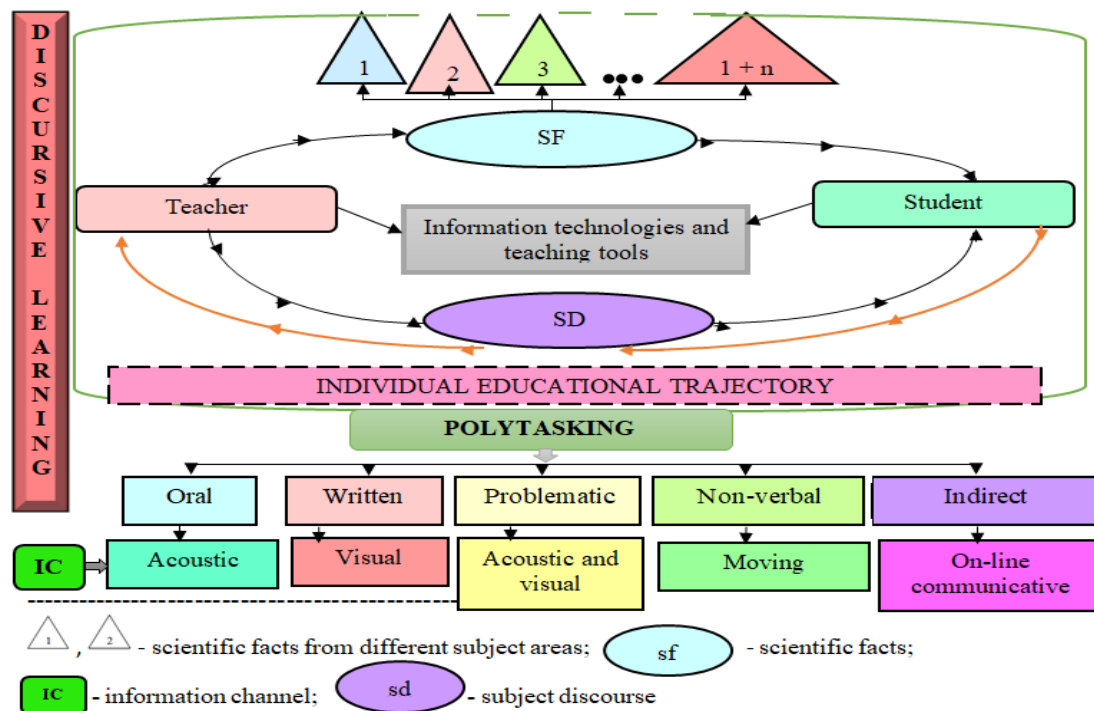


Source: Devised by the authors

The student acquires a set of scientific facts in terms of polytasking (Fig. 2). To maintain an appropriate level of effectiveness of discursive learning, polytasking should not overload the brain of the student with the excessive dynamics of image shift and the monotony of a single form of presentation of material.

To do this, we propose to structure the teaching material in such a way that the following forms of teaching are consistently changed in the polytasking system:

✓ Oral – provided by the acoustic perception of a short audio bite and giving a laconic answer by the listener;

✓ Written – made possible by the visual perception of the proposed text snippet and test task, and the subsequent search for the correct answer options;

✓ Problematic – based on a combination of acoustic, textual, and visual (drawings, photos) data that make it possible to analyze the proposed problem tasks;

✓ Non-verbal – based on familiarization and reproduction of a non-verbal signal, which is a part of the pedagogical culture and external technology;

✓ Indirect – a source of online communication in the course of a collective creative discourse (Fig. 2).

In structuring the content of the forms of presentation, a lecturer should consider the following criteria: scientific and practical prudence, individual orientation, information, and technological content. The first criterion actualizes the selection of the most optimal educational material, which scientific and practical importance should correspond to the appropriate educational and qualification student's degree and consider the peculiarities of the teaching profession. Compliance with the second criterion should ensure the functioning of the individual educational space to form the pedagogical competence of students (BODNAR; MIRKOVICH; KOVAL, 2019). Considering the criterion of the information and technological content should ensure 24-hour access of students to educational materials to meet the needs for self-education and professional improvement. Thus, the tendency of continuity provides the appropriate quality of professional training, prompts a student to actively develop information resources aimed at training and self-education (BANTASH *et al.*, 2020).
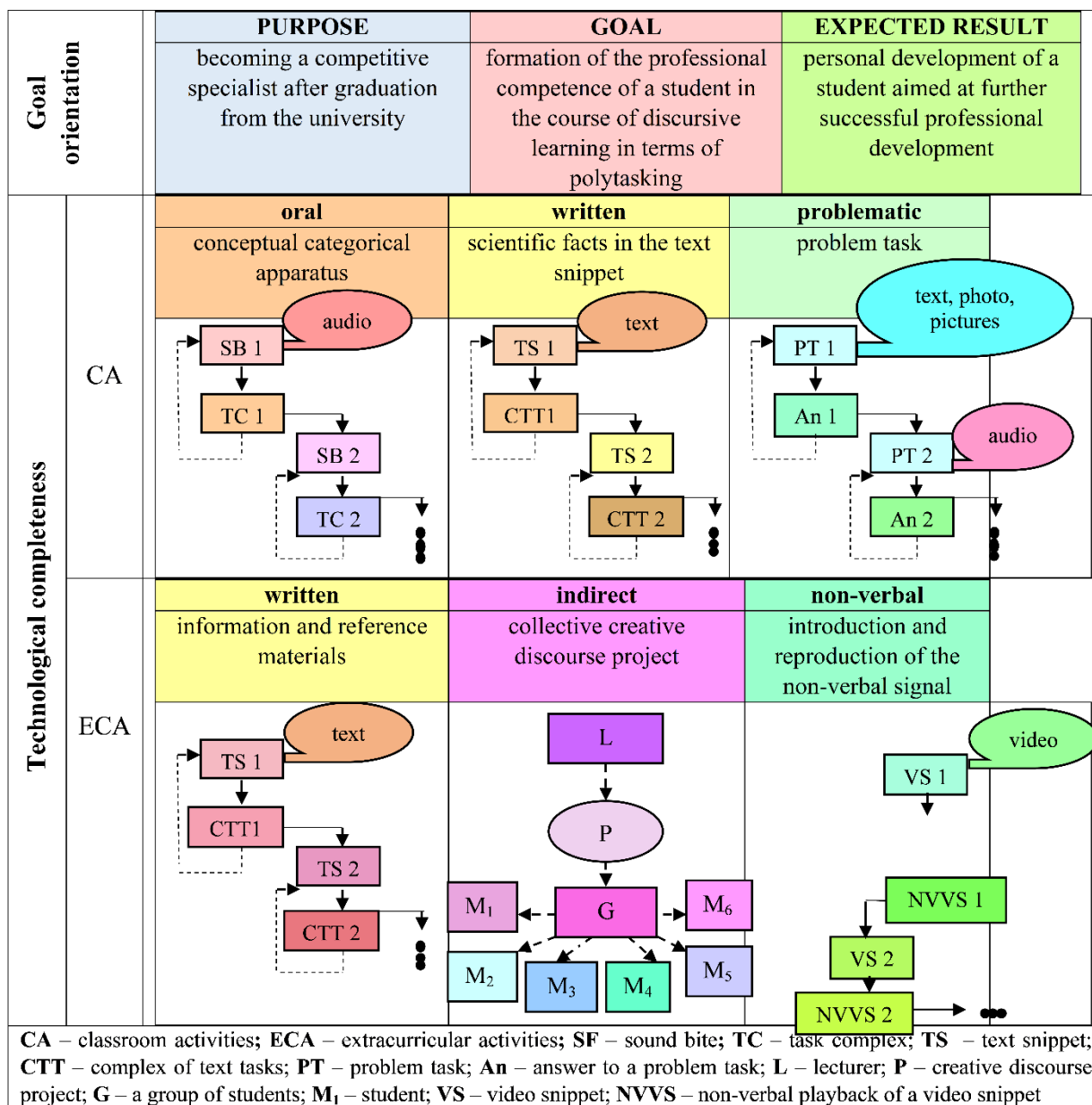
The set of these criteria allows forming an individual educational trajectory of a student, which is adapted to the educational needs and individual abilities of every student. We refer to the individual educational trajectory as an individual way of organizing an educational process, focused on the development of cognitive abilities through the level differentiation of content, tasks, and types of educational activities, considering cognitive needs, abilities, and interests.

Foreign researchers, considering the issue of future teachers' training in terms of polytasking use the term of hypothetical learning trajectories, which is somewhat broader than the concept of individual educational trajectory. Hypothetical learning trajectories are presented with three fundamental components – the purpose and goal of learning, the development of thinking, and the polylevel of educational problem tasks in a specific subject area. Thus, the use of the term of hypothetical learning trajectories in the analysis of the researched topic is scientifically correct and appropriate. For argumentation of this point, a model of hypothetical trajectories of discursive learning of a student of the university in terms of polytasking was developed.

For discussion, the model of hypothetical trajectories of discursive learning of students of the university in terms of polytasking is differentiated into two main stages – classroom and extracurricular activities. Each stage of the classroom and extracurricular activities involves working with text snippets, considering the features of discursive learning. Task complexes, which are composed of text snippets, get more complicated increasing the level of complexity (oral, written, non-verbal) (Fig. 3). Proper performance of tasks is the key to navigating to the next page of existing content. If three mistakes are made, a student is provided with information

and reference materials (text comments, explanations, generalized glossaries from the previous topics).

**Figure 3.** Model of hypothetical trajectories of discursive learning of students of the university in terms of polytasking

| Goal orientation | | PURPOSE | GOAL | EXPECTED RESULT |
|---|---|---|---|---|
| | | becoming a competitive specialist after graduation from the university | formation of the professional competence of a student in the course of discursive learning in terms of polytasking | personal development of a student aimed at further successful professional development |



CA – classroom activities; ECA – extracurricular activities; SF – sound bite; TC – task complex; TS – text snippet; CTT – complex of text tasks; PT – problem task; An – answer to a problem task; L – lecturer; P – creative discourse project; G – a group of students; M₁ – student; VS – video snippet; NVVS – non-verbal playback of a video snippet

Source: Devised by the authors

After studying the content of information and reference materials, a student is given an additional opportunity to complete the same tasks. The successful completion of similar tasks enables a student to move to the next page of the content. A separate block of extracurricular activities is the preparation of a collective creative discourse project, in which the entire group of students takes part, and the lecturer's function is advisory.

To maximize the effectiveness of discursive learning of students, it is recommended to differentiate the tasks of polytasking, taking into account certain regularities regarding the need for a consistent change of types of perception (in particular, oral, written, non-verbal) to avoid information overload; an increase of tasks by levels of complexity (differentiated approach), which allows tracking the performance of material assimilation; considering individual peculiarities of perception, which makes it possible to move to the next level of complexity, or vice versa – to return to the previous level to review the previous material (Fig. 3).

A characteristic feature of discursive learning is the point that in terms of polytasking, a student can work at studying the conceptual and categorical apparatus of his branch; solving a complex of test tasks; consideration of the proposed problem task; independent writing of creative discourse (text snippet on a certain subject), taking into account the profile of its educational and study program; acquaintance and reproduction of the non-verbal signal – a kind of non-verbal means of interpersonal interaction, which is a particularly important construct in the system of pedagogical communication.

Basic principles of discursive learning in terms of polytasking are subject integrity (the process of learning occurs in the course of integral perception of the material), educational individualization (formation of the individual educational trajectory due to the involvement of information technologies and teaching tools), synchronous cyclicity (the emergence of problematic situations at the stage of assimilation involves an automatic transition to the level of the topic the student has failed), professional variability (subject orientation of educational material to the current requirements).

Therefore, the introduction of discursive learning in terms of polytasking allows achieving positive learning dynamics, based on the goal orientation and technological completeness of the developed model, which will improve the quality of knowledge, activate the formation of necessary skills and abilities, orienting the student to further professional activity in terms of polytasking.

## Conclusions

Thus, the prospect of improving the quality of students' education is a complex and multifaceted task that cannot be solved without using the available potential of information technologies and teaching tools. It is pedagogically appropriate to involve them in the organization of discursive learning of university students in terms of polytasking, which actualizes the partial replacement of traditional forms of teaching with more innovative ones.

A polytasking algorithm will make it easier to learn and solve many tasks of professionally-oriented content. Active methods of discursive learning in terms of polytasking enhance the quality of students' education by adhering to the principles of theory and practice integration.

Students' reflection of the target orientation and technological fullness of discursive learning in terms of polytasking will ensure its successful involvement in further professional activity, actualize maintaining the tendency of individualization of the educational process with the use of information technologies and teaching tools. These perspectives will be the basis for the development of the latest e-learning courses to be developed by our students, taking into account the need to overcome individual difficulties in the study of a particular subject. This tendency will make it possible to increase the competitiveness of our students and graduates in general in the international labor market.

However, the results of the research do not exhaust the multidimensional nature of further scientific research. Promising is the development of a structural, content, and methodological model of the formation of professional competence of students of pedagogical specialties taking into account the potential of discursive learning in terms of polytasking; electronic training courses in different disciplines of the curriculum considering the need to build an individual educational trajectory of students of different specialties.

## REFERENCES

ALKAHTANI, M.; AHMAD, A. Darmoul Polytasking Trends and Impact on Education: A Literature Review. **Proceedings of the 18th International Conference on Supply Chain and Logistics Engineering**, ICSCLE. Madrid, pp.995-1001. 2017.

AMELIN, A.; FISHCHUK, V.; LAVRYK, Y.; YURCHAK, O.; CHERNEV, E.; MATYUSHKO, V. "**Ukraine 2030E – The country with the advanced digital economy**", 2019 [Online]. Available: https://hvylya.net/analytics/economics/ukraina-2030e-kraina-z-rozvinutoju-cifrovojuekonomikoju.html

ANDRUSHCHENKO, V. **2019 Report of the Rector of the NPA**. Kyiv: Vyd. NPU. 2019.

ARSAWAN, I. W. E.; KOVAL, V.; RAJIANI, I.; RUSTIARINI, N. W.; SUPARTHA, W. G.; SURYANTINI, N. P. S. Leveraging knowledge sharing and innovation culture into SMEs sustainable competitive advantage. **International Journal of Productivity and Performance Management**. 2020. DOI: https://doi.org/10.1108/IJPPM-04-2020-0192

AUSTRING, B.; SØRENSEN, M. Aesthetics and Learning. **The Future of Education**, 2, 11-15. 2013.

BAKHMAT, N. V.; DUDKA, T. Y.; LIUBARETS, V. V. Multimedia education technologies usage as the condition for quality training of the managers of socio-cultural activity. **Information technologies and learning tools**, (64 „№ 2), 98-109. 2018.

BANTASH, A.; KOVAL, V.; BASHYNSKA, M.; KOZLOVTSEVA, V. Balanced territorial economic development in the conditions of providing stability of human resources management. **Economics. Ecology. Socium**, 4(3), 58-66. 2020.

BODNAR, S.; MIRKOVICH, I.; KOVAL, V. Human capital development in Ukrainian education system by means of language integrated teaching. **Dilemas contemporaneos-educacion politica y valores**, 7 (SI), 14. 2019.

BYKOV, V.; BUROV, O.; GURZHIY, A.; ZHALDAK, M.; LESHCHENKO, M. *et al.* **Development of theoretical foundations of education informatization and practical implementation of information and communication technologies in the educational sphere of Ukraine**. Zhytomyr: ZDU im. I. Franka. 2019.

CALDERWOOD, C.; ACKERMAN, P. L.; CONKLIN, E. M. What else do college students "do" while studying? An investigation of multitasking. **Computers & Education**, 75, 19-29. 2014.

CARRIER, L.; CHEEVER, N.; ROSEN, L.; BENITEZ S.; CHANG, J. Polytasking across generations: Polytasking choices and difficulty ratings in three generations of Americans. **Computers in Human Behavior**, 25, 483–489. 2009.

Center of digital learning technologies. "**Naturalists, Ukrainian philologists, and future coaches are the leaders of digital education at the university!**". n.d. Available: https://www.cctn.npu.edu.ua/ index.php/99-prodnychnyky-ukrainski-filolohy-i-maibutni-trenery-lidery-tsyfrovoi-osvity-v-universyteti.

DROBNIC, J. The Key Innovations in Career Guidance on Labour Market. **Economics. Ecology. Socium**, 3, 12-22. 2019.

HAJDUOVA, Z.; KLIMEK, M.; DANESHJO, N.; PROKOPENKO, O. Competitiveness of Franklin Templeton Fund Managers: Do the Fund Managers Exceed the Benchmark? **Journal of Competitiveness**, 3, pp. 70-80. 2019. DOI: https://doi.org/10.7441/joc.2019.03.05

HEITMANN, P.; HECHT, M.; SCHERER, R.; SCHWANEWEDEL, J. "Learning Science Is About Facts and Language Learning Is About Being Discursive"—An Empirical Investigation of Students' Disciplinary Beliefs in the Context of Argumentation. **Frontiers in psychology**, 8, 946. 2017.

IOANNOU, M. Investigating the discursive shift in the learning of Group Theory: Analysis of some interdiscursive commognitive conflicts. In: **CERME 10**. 2010.

IVARS, P.; FERNÁNDEZ, C.; LLINARES, S.; CHOY, B. H. Enhancing noticing: Using a hypothetical learning trajectory to improve pre-service primary teachers' professional discourse. **Eurasia Journal of Mathematics, Science and Technology Education**, 14 (11), em1599. 2018.

JUDD, T.; KENNEDY, G. Measurement and evidence of computer-based task switching and multitasking by 'Net Generation'students. **Computers & Education**, 56(3), 625-631. 2011.

KALISH, V. A cognitive and discursive approach in high school linguomethodics. Naukovi zapysky. **Psykhologo-pedagogichni nauky**, 4, 20-25. 2018.

KARPINSKI, A. C.; KIRSCHNER, P. A.; OZER, I.; MELLOTT, J. A.; OCHWO, P. An exploration of social networking site use, multitasking, and academic performance among United States and European university students. **Computers in Human Behavior**, 29(3), 1182-1192. 2013.

KOVAL, V.; POLYEZHAYEV, Y.; BEZKHLIBNA, A. Communicative competences in enhancing of regional competitiveness in the labour market. **Baltic Journal of Economic Studies**, 4(5), 105-113. 2018. DOI:10.30525/2256-0742/2018-4-5-105-113

KUDIN, A.; KUDIN, P.; PROSHCHENKO, A.; MINENKO, O.;  KOVAL, R.; KUDINA, T. Web-based information system for organizing communications during blended learning. **Fizyko-matematychna osvita**, 2, 66–71. 2019.

KUMPULAINEN, K.; RAJALA, A. Dialogic teaching and students' discursive identity negotiation in the learning of science. **Learning and Instruction**, 48, 23-31. 2017.

KVITKA, S.; STARUSHENKO, G.; KOVAL, V.; DEFORZH, H.; PROKOPENKO, O. Marketing of Ukrainian higher educational institutions representation based on modeling of webometrics ranking. **Marketing and Management of Innovations**, 3, pp. 60-72. 2019.

MCSWEENEY, F. The Changing Role of the University: A Discursive Analysis of Good Teaching and Positioning of Academics and Students in Improving the Quality of Teaching and Learning in Europe's Higher Education Institutions. **Irish Journal of Academic Practice**, 6(1), 3. 2017.

NOSENKO, Y.; SHYSHKINA, M.; OLEKSIUK, V. **Collaboration between research institutions and university sector using cloud-based environment**. 2018. arXiv preprint arXiv:1807.08741.

PRATIWI, I. M.; RACHMAN, S. P. D.; ARIAWAN, V. A. N. Students' mathematical understanding reviewed by gender through discourse learning assisted by mathematical bet line strategy. **Journal of Physics: Conference Series** (Vol. 1157, No. 4, p. 042103). IOP Publishing. 2019.

PRENSKY, M. **Education to better their world:** Unleashing the power of 21st-century kids. Teachers College Press. 2016.

PROKOPENKO, O. V.; KARMINSKY, A. M.; KLYMENKO, O. V. The role of ratings in the educational process of higher education institutions. **Marketing and Management of Innovations**, 4(2), pp. 141–146. 2011.

SNOW, S.; WILDE, A.; DENNY, P.; SCHRAEFEL, M. C. A discursive question: Supporting student-authored multiple choice questions through peer-learning software in non-STEMM disciplines. **British Journal of Educational Technology**, 50(4), 1815-1830. 2019.

STANDLEY, T.; ZAMIR, A.; CHEN, D.; GUIBAS, L.; MALIK, J.; SAVARESE, S. Which tasks should be learned together in multi-task learning?. **International Conference on Machine Learning** (pp. 9120-9132). PMLR. 2020.

THUNG, K. H.; WEE, C. Y. A brief review on multi-task learning. **Multimedia Tools and Applications**, 77(22), 29705-29725. 2018.

TORRENTS, I.; COMAS PARRA, M. Possibilities and limitations of digital polytasking for school homework. Quaderns de politioques familiars, 03. 2017. Available: http://quadernsdepolitiquesfamiliars.org

WEIS, L. Theoretical Approach to E-Learning Quality. **Economics. Ecology. Socium**, 5, 33-45. 2021.

YOUNG, R. **Discursive practice in language learning and teaching** (Vol. 58). Malden, MA: Wiley-Blackwell. 2009.

ZHALDAK, M. Problems of informatization of educational process at secondary and higher educational establishments. **Kompyuter u shkoli ta simyi**, 3, 8-15. 2013.

ZHAO, J.; DU, B.; SUN, L.; ZHUANG, F.; LV, W.; XIONG, H. Multiple relational attention network for multi-task learning. In: **Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining** (pp. 1123-1131). 2019.