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Conceptual framework of tandem self-projection technology**Natal'ya S. Koshevaya**

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Abstract

This article reveals the substantive aspect of the educational technology conceptual basis, speaking about the tandem self-projection technology, the essence of which is when the tandem of students independently determines a joint route of project activity, and each participant in the tandem builds-up his own professional competence and identifies the personal image of the future professional. At the same time, joint activities incline each member of the tandem to align himself with the project line of his partner, helping him overcome barriers in professional training. The purpose of the article is to present and familiarize the scientific community with the theoretical methodological basis of the tandem self-projection technology. The theoretical research methods, namely, the analysis of scientific literature, the analysis of the basic concepts of, for instance, the technology of paired (collective) learning and self-projection technologies, are used to develop conceptual framework for the technology of tandem self-projection. The article presents a summary of various viewpoints of both domestic and foreign scientists of integration technologies (paired (collective) learning and self-projection), which make up the conceptual basis of the technology. The article can be useful for the teachers using new educational technologies in their activities, since the technology of tandem self-projection can also find its application in the practice of preparing students of various specialties.

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Keywords

Educational technology, tandem self-projection technology, collective interaction technology, project method of learning, conceptual framework of technology.

Background

Present stage of social development presumes that tecnification of education in higher institutions is connected with the issues of increasing the effectiveness of training and education of future professionals with various levels of experience.

It is proved by the practice of recent decades, that the extensive use of technology in education allows improving the quality of the educational process and the level of the general culture of future specialists, making them more successful both in life and in the profession, as well as makes education more comfortable and optimizes the cost of providing educational process.

In this regard, it is suggested to consider the technology of tandem self- projection, its conceptual basis for better understanding, and its effective implementation.

Theoretical analysis of the conceptual basis of the tandem self-projection technology is based on the materials of the conceptual foundations and provisions of the paired (collective) learning technology, project methods and self-projection technology as it is.

A review of the scientific literature on the study of the said technologies revealed a number of scientists, both domestic and foreign, who contributed to the determination of a coherent picture of how we see the conceptual basis of tandem self-projection technology. Among these scholars are:

-I.M. Vitkovskaya, E.R. Garavan, V.K. Dyachenko, R. Karber, A. Uvari-Solner et al. (technology of collective learning);

-V.V. Bailuk, O.A. Zaretskaya, I.S. Kazakov, N.S. Koshevaya, N.V. Chepeleva et al. (self-projection technology);

-E.V. Belikova, I.V. Boriskova, J.Kh. Bjornstad, R.I. Btemirova, R.B. Reynolds, N.Yu. Tavares, M. Notary, C.W.Y. Lii et al. (project method).

Main part

In the conceptual framework of educational technology, in our case, tandem self-projection technology lays the scientific base together with a number of theoretical provisions of the technology of collective interaction, namely, dynamic pairs' interaction, and psychological and pedagogical ideas of self-projection technology.

The technology of collective interaction was developed by A.G. Rivin and his successors V.V. Arkhipova, V.K. Dyachenko, I.B. Pervin, A.S. Sokolov and others.

To date, the problem of joint interaction is under study with such scientists as I.M. Vitkovskaya, J. Boom, E.R. Garavan, R. Carbury, V.V. Kashaeva, A. Udvari-Solner Chu, S. K. W., Tse, S. K., Loh, E. K. Y., Chow, K., et al.

The main essence of collective interaction is that participants in the process are organized in such a way, that learning is carried out through communication, where everyone is a teacher.

There are several understandings of the collective learning.

According to I.M. Vitkovskaya, when in the process of studying at a university the students form a mixed pair it helps them to develop the appropriate competencies that they need in their future professional activities (personal and interpersonal relationships). As well as the ability to conduct synthesis and analysis, the ability to organize and plan, the ability to work in a team, the ability to apply knowledge in practice, generate research skills and responsibility for quality [Vitkovskaya, 2011].

E.R. Garavan and R. Karber believe that collective learning is an evolutionary process to improve the knowledge gained, which is formed and distributed through interaction between people [Garavan, 2012].

A. Udvari-Solner argues that collaborative learning is a step-by-step interaction between participants, where responsibility and authority are divided with a focus on the result of activity [Udvari-Solner, 2012].

The modern technology of collective learning in higher education is determined by V.V. Trutanova and O.I. Vaganova as the organization of educational and cognitive activity of students in pairs of mixed composition based on the principles of peer learning, peer control and peer management [Trutanova, Vaganova, 2017].

The main idea of mutual learning suggested by A.G. Rivin and V.K. Dyachenko has been used as a basis for the technology of paired self-design, in which the partners act either as a student or as a teacher, focusing on the levels of development of personal characteristics and abilities of the participants of the training, including their feasible dialogue-cooperation in the form of shifting pairs.

In contrast to this idea, participants in the tandem self-projection technology act as equal partners in joint activities, having strategic plans for the formation of the professional competence of their own. In this case the participants do not teach each other, but provide all possible assistance in organizing and implementing activities to eliminate problem areas, in determining comparable trajectories and routes of educational interdependent activities with a focus on their and their partner's prognostic image of the future specialist.

The fundamental aspect of the technology under consideration is the students' self-projection of educational activities.

Unlike the foreign authors, the domestic scientists have given a lot of attention to the phenomenon of "self-design" in recent decades.

The phenomenon of "self-design" from the standpoint of some domestic scientists look as follows.

V.V. Bailuk understands self-projection as "... when an individual designs his future activity (ideal Me), when goals, resources, procedures and their conditions are determined, together with the desired result" [Bailuk, 2010, 32].

According to O.A. Zaretskaya, self-projection is an endless process, which, when "launched" further, "... motivates itself for continuation." In the context of "personal self-designing" the author shows that "... this is a purposeful work on one's personality, a conscious transformation of oneself ..." [Zaretskaya, 2016, 50]

I.S. Kazakov understands self-projection as "...the process of self-formation, self-making, mastering and appropriation of schemes and norms of self-management" [Kazakov, 2011, 132].

N.S. Koshevaya presents self-projection (reflexive competence) as "... the ability of the subject of the educational process to independently gradually develop a personal reflexive essence through the mechanisms of the self-identity, like self-formation, self-regulation and self-management of the subject" [Koshevaya, 2016, 139]

N.V. Chepeleva considers the self-projection of a personality from the standpoint of the process "... of building one's identity, based on the development and appropriation of culturally predetermined schemes and norms of self-organization" [Chepeleva, www].

Thus, a review of scientific papers showed that self-projection is, first of all, the transformation of personality.

The context of present work presumes the process of self-projection to be the process of transforming oneself in the personal as well as in the professional sense.

This transformation is impossible without the project method in education, which underlies the joint activity of students of the proposed technology.

The world pedagogical community currently acknowledges the project method. Today, both in domestic and foreign literature, there are various definitions and approaches to the implementation of the project method.

The analysis of scientific works showed that such modern scientists as E.V. Belikova, I.V. Boriskova, J.Kh. Bjornstad, R.I. Btemirova, R.B. Reynolds, N.Yu. Tavares, M. Notary, C.W.Y. Lee, S.K.U. Chu, M. Holm, K.A. Howey, S.L. Ferguson, D. Meyher, S. Lorca, B. Johnson, M.A. Rogers, D.I. Cross, M.S. Gresalf, T. Muir, K. Beswick, R. Kollingen deal in investigation of the project method in education, and believe that this method engages the students in an active cognitive process. On the basis of the project method, students are invited to independently find solutions for specific problems collecting the necessary information, independently plan options for getting out of problem situations, which, according to the authors, leads to the acquisition of new skills and abilities.

According to a number of authors, R.B. Reynolds, N.Yu. Tavares, M. Notary, C.W.Y. Lee, S.K.W. The Chu among them, method of projects based on collaborative learning supported by Wiki stimulates learning, in which modern students acquire innovative skills not only in aspects of learning, but also in life and career [Reynolds, 2016].

Despite differences in interpretation, the authors are unanimous that the project method is focused on independent work and that the “end-product” has practical value for the student.

As practice shows, project-based learning is characterized by certain specificity and diversity, therefore, its effective implementation requires diverse and well-developed approach to the development and implementation of the project method in the educational process.

So, according to the authors K.A. Howie, S.L. Ferguson D. Maher, M.A. Rogers, D.I. Cross et al., the project-based learning is peculiar with the successful harmonization of all parts of project activities, to which authors refer a thorough knowledge of the educational material by the teacher, the structure of the curriculum and a creative approach to planning project activities, a set of specific tasks, the development of all learning contexts, a focused selection of resources and information sources, determining the time of the project implementation with the participants [Maher, 2015; Rogers, 2011; Howie, 2014].

Presented opinion coincides with that of the authors regarding a well-thought-out strategy in the development of learning projects, since in the project method in education the outcome of the educational process is an individual experience of productive activity.

The peculiarity of this method lies in the ideas of D. Dewey, and consists in the organization of educational activities to solve practical problems taken from everyday life. Therefore, its theoretical basis is the ideas underlying the development of a project system or project method, the essence of which is that, students, together with the teacher, search for a solution to a practical problem, based on their interests.

In the implementation of tandem self-projection technology, the design method is fundamental. The participants in the process, on the basis of an independently developed project line, determine the ways to achieve the intended results through interdependent activity to solve professionally directed tasks, taken both from the accumulated practical and theoretical material, and personal cumulative professional experience.

The tandem self-projection technology conceptual basis is planned to be substantively based on the position that:

- the student in individual professional development improves the way of becoming a professional;

- interdependent activity in professional development is a controlled and preset process;
- projecting his partnership-based educational activity, a student not only determines the trajectories of joint educational activities and predicts the personal image of a specialist, but as a result improves and enriches them through the interdependent influence of the characteristics of the subjects of activity;
- interdependent activities involves the best advantage of psychological and personal characteristics of students;
- replacement of inefficient education with innovative education and adaptation to the new;
- the organization of paired self-project activities by participants in the educational process is focused on a high learning outcome.

Considering the conceptual framework of the tandem self-projection technology, it can be concluded that the following criteria underlie its effective implementation:

- the tandem builds-up such self-project activities, in which the level of formation of professional competence of future specialists will be close to high and focused on the image of a “universal professional”;
- the tandem focuses on the development of such self-project activities in which interdependent activities would stimulate the activity of each participant;
- tandem work reasonably combines with the individual role of each of its participants;
- the most efficient use of study time due to the interdependent self-organization and interdependent self-regulation designed in a tandem;
- tandem systematically verifies the design tasks through interdependent self-reflection.

Results

The effectiveness of the implementation of the tandem self-projecting technology has been tested by studying the dynamics of how the future economists perceive the importance of the professional and personal qualities of an economist of the future. The study involved 145 students of the Faculty of Economics of the Sochi Institute of the Peoples' Friendship University of Russia, divided into a control group (CG) and an experimental group (EG). The students of the control group carried out professional training in the traditional form, while the students of the experimental group employed the technology of tandem self-design.

Based on the analysis of the educational standard of the "Economics" program and the professional standard of economic specialties, the following qualities of an economist have been selected to study the significance:

- a *retentive memory*, which aids an economist in processing a large amount of economic indicators;
- *analytical and mathematical thinking* means the ability to analyze and perform calculations in accordance with the task;
- *high attention focusing* is the ability to identify the necessary and important matter from extensive economic information;
- *intuition* means the ability to accurately forecast and design considering a reasonable risk;
- *creativity* means the capability to produce new, non-standard ideas in the process of professional activity;

- *ingenuity* consists in the ability to search for quick, uncommon and non-obvious solutions to professional problems;
- *business acumen* is the ability to impeccably plan and organize work, the ability to instant start of acting professionally to achieve high and profitable results;
- *sociability* means the ability to communicate with opponents at any level, be capable of conducting business negotiations and arrange favorable terms of the transaction;
- *self-improvement* is a capability of person to purposefully develop business abilities and skills to achieve harmony in professional activities;
- *self-criticism* is an objective assessment of one's professional actions in various conditions and circumstances;
- *modernity* means employment of modern technologies for the collection, processing, analysis of economic indicators.

According to our survey of students on the importance of significant professional and personal qualities of a future economist, we obtained the initial and final data presented by us in Table 1.

Table 1 - Significant professional and personal qualities of future economists distributed by respondents, %

Significant personal qualities of economists	Groups involved in experiment			
	CG learning start	CG learning ending	EG learning start	EG learning ending
retentive memory	57	≈ + 6	85	0
analytical thinking	15	≈ + 3	31	≈ +42
mathematical thinking	66	≈ +12	46	≈ +48
high attention focusing	21	≈ + 2	35	≈ +36
intuition	41	≈ + 5	71	≈ +15
creativity	63	≈ + 9	36	≈ +25
ingenuity	61	≈ + 7	41	≈ +32
business acumen	48	≈ +10	72	≈ +22
sociability	68	≈ - 7	61	≈ +32
self-improvement	58	≈ +19	71	≈ +24
self-criticism	78	≈ + 7	46	≈ +15
modernity	75	≈ +12	88	≈ +5

The conclusion based on the data in Table 1, is that the dynamics of the experimental group in terms of the importance of professional and personal qualities of future economists is a sequence higher than that of students in the control groups.

Conclusion

The technology of tandem self-projection is the organization by a tandem of students of independent project activities to draw up routes and trajectories of joint activities for the formation of

professional competence of the future experts, each tandem participant being guided by the project line of his partner. The technology is based on the principles of cooperation, each student performing as an equal partner. Technology ensures the development of both the personal qualities of future specialists and professional ones, therefore its introduction into professional training will increase the level of experience of future specialists, and understanding the conceptual basis of technology will allow teachers optimizing it in the best possible way, based on the goals and didactic strategies of professional training.

References

1. Bailuk V.V. (2014) *Chelovekoznanie. Samopoznavatel'naya samorealizatsiya lichnosti kak zakon uspekha* [Human knowledge. Self-cognitive self-realization of personality as the law of success]. Yekaterinburg.
2. Bedard D. et al. (2012) Problem and Project-Based Learning in Engineering and Medicine: Determinants of Student Engagement and Perseverance. *Interdisciplinary Journal of Problem-Based Learning*, 6, 2, pp. 7-30.
3. Belikova E.V. *Metod proektov v obrazovanii* [Method of projects in education]. Available at: <https://urok.1sept.ru/articles/648795> [Accessed 03/03/2022]
4. Bota M. (2010) A project approach to learning as a method of teaching entrepreneurship to a large group of undergraduate students in South Africa. *Education as change*, 14, 2, pp. 213-232. <http://dx.doi.org/10.1080/16823206.2010.522059>
5. Chepeleva N.V. *Samoproektirovanie kak faktor razvitiya lichnosti* [Self-design as a factor in the development of personality]. Available at: <https://docplayer.com/53212357-Samoproektirovanie-kak-faktor-razvitiya-lichnosti.html> [Accessed 03/03/2022]
6. Doroshina L.A. (2018) Innovatsionnaya proektnaya deyatel'nost' kak put' sovershenstvovaniya proektnoi deyatel'nosti uchashchegosya [Innovative project activity as a way to improve the student's project activity]. In: *Sovremennoe tekhnologicheskoe obrazovanie: opyt, innovatsii, perspektivy* [Modern technological education: experience, innovation, prospects]. Lipetsk.
7. Garavan T.N., Carbury R. (2012) Collective learning. In: *Encyclopedia of the Sciences of Learning*. Boston.
8. Gutsol S.Yu. (2017) Samokonstruirovaniye lichnosti: postanovka problemy [Personality self-construction: problem statement]. In: *Psikhologicheskoe soprovozhdeniye obrazovaniya: teoriya i praktika* [Psychological support of education: theory and practice]. Yoshkar-Ola.
9. Holm M. (2011) Project-Based Learning: A Review of the Literature on Effectiveness in Kindergarten through 12th Grade. *Rivier Academic Journal*, 7, 2, pp. 1-13.
10. Howie K.A., Ferguson S.L. (2014) Views and experiences of teachers. Using Project-Based Learning with Exceptional and Diverse Students. *Curriculum and Pedagogical Dialogue*, 16, 1-2, pp. 7-90.
11. Kazakov I.S. «Samoproektirovanie» – analiz ponyatiya [Self-design: analysis of the concept.]. Available at: http://www.vestnik.sutr.ru/journals_n/1318571091.pdf [Accessed 03/03/2022]
12. Koshevaya N.S. (2016) Samoproektirovanie refleksivnoi kompetentnosti akademicheskogo bakalavra ekonomicheskogo napravleniya [Self-projecting the reflexive competence of an academic bachelor in economics]. *Simvol nauki* [Symbol of science], 2-1, pp. 138-140.
13. Maher D. (2015) Window to the world: videoconferencing using tablets in schools. In: *Advances in communications and media research. Vol. 11*. New York.
14. Reynolds R. et al. (2016) Twenty-First Century Skills Education in Hong Kong and Shenzhen, China: Inquiry Project-Based and Collaborative Teaching. In: *21st Century Skills Development Through Inquiry-Based Learning*. Springer.
15. Rogers M.A. et al. (2011) Implementing a Project-Based Learning Approach in the First Year: The Need to Consider Teacher Orientation in an Era of Reform. *International Journal of Science and Mathematics Education*, 9, 4, pp. 893-917.
16. Smolyaninova O.G. et al. (2021) Project activity as a mechanism for the development of reflection of students of the psychological and pedagogical direction of training. *Journal of Siberian Federal University. Humanities and Social Sciences*, 14, 3, pp. 385-395.
17. Trutanova A.V., Vaganova O.I. (2017) Organizatsiya smeshannogo obucheniya v vysshei shkole [Organization of blended learning in higher education]. In: *Neofit* [Neophyte]. Nizhniy Novgorod.
18. Udvari-Solner A. (2012) Collaborative learning strategies. In: *Encyclopedia of the Sciences of Learning*. Boston.
19. Vitkovskaya I.M. (2011) Pary smennogo sostava v obuchenii studentov pedvuza [Pairs of shift staff in teaching students of a pedagogical university]. *Gertsenovskie chteniya. Nachal'noe obrazovanie* [Herzen Readings. Primary education], 2, 1, pp. 302-306.
20. Zaretskaya O.A. (2016) Samoproektirovanie i lichnostnoe razvitiye (metodologicheskii aspekt) [Self-projecting and personal development (methodological aspect)]. In: *Psikhologicheskoe znanie v kontekste sovremennosti: teoriya i praktika* [Psychological knowledge in the context of modernity: theory and practice]. Yoshkar-Ola.

Технология тандемного самопроектирования: концептуальная основа

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Аннотация

В настоящей статье раскрывается содержательный аспект концептуальной основы образовательной технологии – технологии тандемного самопроектирования, суть которой заключается в самостоятельном определении тандемом студентов совместного маршрута проектной деятельности в процессе формирования каждого участника тандема собственной профессиональной компетентности и выявлению личного образа будущего профессионала. При этом в совместной деятельности каждый участник тандема ориентируется на проектную линию своего партнера, помогая ему преодолеть барьеры в профессиональной подготовке. Цель статьи – представить и ознакомить научное сообщество с теоретической методологической базой технологии тандемного самопроектирования. Применяя теоретические методы исследования, а именно, анализ научной литературы, анализ базовых понятий таких технологий как технология парного (коллективного) обучения и технологии самопроектирования была разработана концептуальная основа технологии тандемного самопроектирования. В статье представлен обзор различных точек зрения, как отечественных, так и зарубежных ученых интеграционных технологий (парного(коллективного) обучения и самопроектирования), составляющих концептуальную основу технологии. Содержание статьи может быть полезно тем педагогам, которые в своей деятельности применяют новые образовательные технологии, поскольку технология тандемного самопроектирования также может найти свое применение в практике подготовки студентов различных специальностей.

Для цитирования в научных исследованиях

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Ключевые слова

Образовательная технология, технология тандемного самопроектирования, технология коллективного взаимодействия, проектный метод обучения, концептуальная основа технологии.

Библиография

1. Байлук В.В. Человечествознание. Самопознавательная самореализация личности как закон успеха. Екатеринбург, 2014. 95 с.
2. Беликова Е.В. Метод проектов в образовании. URL: <https://urok.1sept.ru/articles/648795>

3. Витковская И.М. Пары сменного состава в обучении студентов педвуза // Герценовские чтения. Начальное образование. 2011. Т. 2. № 1. С. 302-306.
4. Гуцол С.Ю. Самоконструирование личности: постановка проблемы // Психологическое сопровождение образования: теория и практика. Йошкар-Ола, 2017. С. 104-110.
5. Дорошина Л.А. Инновационная проектная деятельность как путь совершенствования проектной деятельности учащегося // Современное технологическое образование: опыт, инновации, перспективы. Липецк, 2018. С. 23-26.
6. Зарецкая О.А. Самопроектирование и личностное развитие (методологический аспект) // Психологическое знание в контексте современности: теория и практика. Йошкар-Ола, 2016. С. 49-54.
7. Казаков И.С. «Самопроектирование» – анализ понятия. URL: http://www.vestnik.sutr.ru/journals_n/1318571091.pdf
8. Кошечая Н.С. Самопроектирование рефлексивной компетентности академического бакалавра экономического направления // Символ науки. 2016. № 2-1. С. 138-140.
9. Трутанова А.В., Ваганова О.И. Организация смешанного обучения в высшей школе // Неофит. Нижний Новгород, 2017. С. 168-171.
10. Чепелева Н.В. Самопроектирование как фактор развития личности. URL: <https://docplayer.com/53212357-Samoproektirovanie-kak-faktor-razvitiya-lichnosti.html>
11. Bedard D. et al. Problem and Project-Based Learning in Engineering and Medicine: Determinants of Student Engagement and Perseverance // Interdisciplinary Journal of Problem-Based Learning. 2012. Vol. 6. No. 2. P. 7-30.
12. Bota M. A project approach to learning as a method of teaching entrepreneurship to a large group of undergraduate students in South Africa // Education as change. 2010. Vol. 14. No. 2. P. 213-232. <http://dx.doi.org/10.1080/16823206.2010.522059>
13. Garavan T.N., Carbury R. Collective learning // Encyclopedia of the Sciences of Learning. Boston, 2012. 3536 p.
14. Holm M. Project-Based Learning: A Review of the Literature on Effectiveness in Kindergarten through 12th Grade // Rivier Academic Journal. 2011. Vol. 7. No. 2. P. 1-13.
15. Howie K.A., Ferguson S.L. Views and experiences of teachers. Using Project-Based Learning with Exceptional and Diverse Students // Curriculum and Pedagogical Dialogue. 2014. Vol. 16. No. 1-2. P. 7-90.
16. Maher D. Window to the world: videoconferencing using tablets in schools // Advances in communications and media research. Vol. 11. New York, 2015. 17 p.
17. Reynolds R. et al. Twenty-First Century Skills Education in Hong Kong and Shenzhen, China: Inquiry Project-Based and Collaborative Teaching // 21st Century Skills Development Through Inquiry-Based Learning. Springer, 2016. P. 35-59.
18. Rogers M.A. et al. Implementing a Project-Based Learning Approach in the First Year: The Need to Consider Teacher Orientation in an Era of Reform // International Journal of Science and Mathematics Education. 2011. Vol. 9. No. 4. P. 893-917.
19. Smolyaninova O.G. et al. Project activity as a mechanism for the development of reflection of students of the psychological and pedagogical direction of training // Journal of Siberian Federal University. Humanities and Social Sciences. 2021. V. 14. No. 3. P. 385-395.
20. Udvari-Solner A. Collaborative learning strategies // Encyclopedia of the Sciences of Learning. Boston, 2012. 3536 p.