

Eurasia Journal of Mathematics, Science and Technology Education 2017 vol.13 N8, pages 4915-4928

---

## Cognitive simulation as integrated innovative technology in teaching of social and humanitarian disciplines

Masalimova A., Levina E., Platonova R., Yakubenko K., Mamitova N., Arzumanova L., Grebennikov V., Marchuk N.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

---

### Abstract

© 2017 Authors. Currently, teachers are searching for innovative educational technologies that enhance the effectiveness of educational activities. The purpose of the paper is the development and approbation of cognitive simulation technology in teaching of social and humanitarian disciplines. Based on the integration of sources of innovation, the authors developed the technology of cognitive simulation aimed at the formation of a structured system of knowledge for social and humanitarian disciplines' subject area. Various forms of cognitive map methods used in the learning process (analysis, synthesis, projection, and simulation) allow developing the analytical and predictive abilities of students, and strengthening their educational motivation. The technology use is proposed for the first time for all socio-humanitarian disciplines in the process of vocational training, which contributes to the formation of inter-subject communications, spatial understanding of events, and transformations of reality. The empirical study carried out by the authors on the implementation of this technology in the educational process (the students of 3 universities, totaling 315 people participated in the study) confirmed the productivity of the technology and the possibility of its adaptation to various disciplines of social and humanitarian sphere.

<http://dx.doi.org/10.12973/eurasia.2017.00973a>

---

### Keywords

Cognitive simulation, Education, Educational technology, Innovations, Social and humanitarian disciplines

### References

- [1] Ahn, W.-K., & Medin, D. L. (1992). A two-stage model of category construction. *Cognitive Science*, 16(1), 81-121
- [2] Babintsev, V. P., & Segedin N. N. (2008). Management of innovation processes in the regional education system. Belgorod: Cooperative education
- [3] Baidlikh, V. (2004). *Sociodynamics. A Systematic Approach to Mathematical Modeling in the Social Sciences*. Moscow: Librocom
- [4] Bakhtin, M. M. (2000). *The author and the hero: To the philosophical foundations of the humanities*. St. Petersburg: ABC

- [5] Cao, Y., Kurbanova, A. T., & Salikhova N. R. (2017). Development of Classification Thinking in Future Teachers: Technologies of Reflective Discussion, *EURASIA Journal of Mathematics Science and Technology Education*, 13(6), 1865-1879
- [6] Ginis, L. A. (2015). Cognitive modeling of decision support in problem-oriented systems. *Scientific Review*, 8, 219-224
- [7] Gorelova, G. V. (2013). Cognitive approach to simulation of complex systems. *Proceedings of the Southern Federal University. Series of Engineering Sciences*, 3, 239-250
- [8] Gostev, A. G., & Kipriyanova, E. V. (2008). Innovative educational and professional environment as a factor in the introduction of modern teaching technologies. Ekaterinburg: Ural center for academic services
- [9] Hannan, A., & Silver, H. (2000). *Innovation in Higher Education: Teaching, Learning and Institutional Cultures* Text. Philadelphia: Society for Research into Higher Education & Open University Press
- [10] Il'ina, N. F. (2012). Criteria of readiness of teachers to innovative activities. *Pedagogics*, 7, 82
- [11] Khutorskoy, A. V. (2005). *Pedagogical innovations: methodology, theory, practice*. Moscow: Publishing house UNC DO
- [12] Khutorskoy, A. V. (2007). *Modern didactics*. Moscow: High School
- [13] Kokhanovsky, V. P. (2005). *Philosophical problems of social and humanitarian sciences (formation, features and methodology of social cognition)*. Rostov-on-Don: Phoenix
- [14] Kravchuk, L. F., Kamenskiy E. G., & Battle, E. I. (2010). Integration features the innovative potential of the personality. *News of Kursk state technical University*, 2, 116-121
- [15] Krayevsky, V. V. (2003). Philosophy of education in the system of scientific knowledge. *Bulletin of the Peoples' Friendship University of Russia. Series: Philosophy*, 2, 21-30
- [16] Künsting, J., Kempf, J., & Wirth, J. (2013). Enhancing scientific discovery learning through metacognitive support. *Contemporary Educational Psychology*, 38(4), 349-360
- [17] Levina, E. Yu. (2013). Formalization of social and pedagogical processes. *Kazan Pedagogical Journal*, 1, 134-140
- [18] Martyshenko, S. N., & Stepanenko, A. A. (2017). Automation of multidimensional data processing in cognitive modeling problems. *Fundamental research*, 1, 86-93
- [19] Mukhina, T. G. (2013). *Active and interactive educational technologies (forms of conducting classes) in higher education*. Nizhny Novgorod: NNGASU
- [20] Nemec, M., Krišták, L., Hockicko, P., Danihelová, Z., & Velmovská, K. (2017). Application of Innovative. P& E Method at Technical Universities in Slovakia. *EURASIA Journal of Mathematics Science and Technology Education*, 13(6), 2329-2349
- [21] Oliveira, P. C., & Oliveira, C. G. (2013). Using Conceptual Questions to Promote Motivation and Learning in Physics Lectures. *European Journal of Engineering Education*, 38(4), 417-424
- [22] Osmolovskaya, I. M. (2010). Innovation and pedagogical practice. *Public education*, 6, 182-188
- [23] Podlasay, I. P. (2013). *Theoretical and Practical Pedagogy*. Moscow: Publishing House Yurayt
- [24] Postalyuk, N. Y. (2004). Designing innovative educational systems: a regional perspective. Samara: Samara training center, from <http://psychology.narod.ru/121.html>
- [25] Prokofieva E. N., Shirnin A. Y., Smotrin K. A., Tuisina G. R., Pavlov I. V., Tenyukova G. G., & Filina N. A. (2015). Integrative games as the technique of technical university students' professional competences formation in the field of health and safety. *Mediterranean Journal of Social Sciences*, 2(6), 3-9
- [26] Putjato, M. M. (2010). Development of methods and algorithms of intellectual support of decision-making based on fuzzy cognitive maps. PhD Thesis. Krasnodar: Kuban state technological University
- [27] Safronova, V. M. (2002). *Forecasting and modeling in social work*. Moscow: Publishing Center "Academy"
- [28] Salso, R. L. (2002). *Cognitive psychology*. St. Petersburg: Peter
- [29] Sezginsoy, B., & Akkoyunlu, B. (2011). Effectiveness of systematic instruction on the achievement of history consciousness in social sciences course. *H.U. Journal of Education*, 41, 411-422
- [30] Tsvyk, V. A. (2007). The role of social and human sciences in the formation of a professional. *Bulletin of the Peoples' Friendship University of Russia. Series of Sociology*, 1(11), 34-44
- [31] Van Dijk, L. A., Van Der Berg, G. C., & Van Keulen, H. (2001). Interactive Lectures in Engineering Education. *European Journal of Engineering Education*, 26(1), 15-28
- [32] Zaitsev, V. S. (2012). *Modern pedagogical technologies: educational practice. (Book 2)*. Chelyabinsk, CSPU
- [33] Zarukina, E. V., Loginova, N. A., & Novik, M. M. (2010). *Active methods of teaching: recommendations for development and application*. St. Petersburg: SPbGIEW