

# Improving the quality of engineering education by developing the system of increasing students' motivation

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## Abstract

© 2018, Springer International Publishing AG. Currently, intellectualization processes cover all areas of activity, which is accompanied by an increase in the requirements for the competence of engineers. At the same time, interest of young people in obtaining an engineering education has decreased in many countries. The authors have studied the causes of this phenomenon. The article is devoted to analysis of relation between the quality of engineering education and the level of students motivation. Ways to increase motivation through the application of innovative technologies and creation the learning outcomes monitoring system are considered.

[http://dx.doi.org/10.1007/978-3-319-73204-6\\_19](http://dx.doi.org/10.1007/978-3-319-73204-6_19)

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## Keywords

Education quality control system, Engineering education, Motivation to study

## References

- [1] Models of Blended Learning. <http://www.dreambox.com/blog/6-models-blended-learning>
- [2] Norberg, A., Dzuiban, C., Moskal, P.D.: A time-based blended learning model. *On the Horizon* 19, 207–216 (2011)
- [3] Karabulut-Ilgu, A., Jahren, C.: Evaluation of hybrid learning in a construction engineering context: a mixed-method approach. *Adv. Eng. Educ.* 5, 1–26 (2016)
- [4] Bonk, C.J., Dennen, V.: Frameworks for research, design, benchmarks, training, and pedagogy in web-based distance education. In: M.G. Moore (ed.) *Handbook of Distance Education*, pp. 331–348. Routledge, New York (2013)
- [5] Zawojewski, J.S., Diefes-Dux, H., Bowman, K.: *Models and Modeling in Engineering Education*, 35 p. Sense Publishers, Rotterdam (2008)
- [6] Balamuralithara, B., Woods, P.C.: Virtual Laboratories in Engineering Education: The Simulation Lab and Remote Lab. <http://onlinelibrary.wiley.com/doi/10.1002/cae.20186/abstract>
- [7] Çakıroglu, U., Basıbüyük, B., Güler, M., Atabay, M., Memis, B.Y.: Gamifying an ICT course: influences on engagement and academic performance. *Comput. Hum. Behav.* 69, 98–107 (2017)
- [8] Yáñez-Gómez, R., Cascado-Caballero, D., Sevillano, J.-L.: Academic methods for usability evaluation of serious games: a systematic review. *Multimed. Tools Appl.* 76, 5755–5784 (2017)
- [9] Bhoir, S., Esmaili, B.: State-of-the-Art review of virtual reality environment applications in construction safety. In: *AEI 2015*, pp. 457–468 (2015)
- [10] Martín-Gutiérrez, J., Fabiani, P., Benesova, W., Meneses, M.D., Mora, C.E.: Augmented reality to promote collaborative and autonomous learning in higher education. *Comput. Hum. Behav.* 51, 752–761 (2015)
- [11] Ribón, J.C.R., Villalba, L.J.G., Kim, T.: Virtual learning communities: unsolved troubles. *Multimed. Tools Appl.* 74, 8505–8519 (2015)

- [12] Webel, S., Bockholt, U., Engelke, T., Gavish, N., Olbrich, M., Preusche, C.: An augmented reality training platform for assembly and maintenance skills. *Robot. Auton. Syst.* 61, 398- 403 (2013)
- [13] Wu, H.K., Lee, S.W., Chang, H.Y., Liang, J.C.: Current status, opportunities and challenges of augmented reality in education. *Comput. Educ.* 62, 41-49 (2013)
- [14] Badmaeva, N.C.: *Vliyaniye motivatsionnogo razvitiya na razvitiye umstvennykh sposobnostey*, 280 p. Izd-vo VSGTU, Ulan-Ude (2004)
- [15] *Metodika izucheniya motivatsii obucheniya v vuze T.I. Il'inoy*. <http://testoteka.narod.ru/ms/1/05.html>
- [16] Khagurov, T.A., Ostapenko, A.A.: *Reforma obrazovaniya glazami uchiteley i prepodavateley: opyt sotsiologicheskogo issledovaniya*. Ins-t RAN; Ros. akad. sots. Nauk, Krasnodar. region, 107 p. Otd-ye.- M.-Krasnodar, Parabellum (2013)
- [17] Milligan, C., Littlejohn, A.: Why Study on a MOOC? The motives of students and professionals. *Int. Rev. Res. Open Distrib. Learn.* 18, 92-102 (2017)
- [18] Graven, O.H., Bjørk, J.: The use of an Arduino pocket lab to increase motivation in Electrical Engineering students for Programming. In: 2016 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE), pp. 239-243 (2016)
- [19] Wang, Y.-H.: The effectiveness of integrating teaching strategies into IRS activities to facilitate learning. *J. Comput. Assist. Learn.* 33, 35-50 (2017)
- [20] Bloom, B.S.: *Taxonomy of Educational Objectives Book 1: Cognitive Domain Paperback*. David McKay Company Inc./Longmans, New York (1956). 207 p.
- [21] Bengoetxea, E., Kallioinen, O., Schmidt-Jortzig, I., Thorn, R.: *Quality Assurance in Lifelong Learning*, 32 p. European Association for Quality Assurance in Higher Education, Brussels (2011)