

Further discussion could focus on whether we could have predicted the obtained results. To be honest, we expected a more positive impact on the pupils' opinions and beliefs. However, certain national specifics need to be taken into account. Slovakia has been undergoing a school reform since 2008. The Slovak national curriculum puts emphasis on the inquiry-based approach in the teaching of NS, however there is a lack of supporting materials available to teachers for the realization of IBSE. Slovak teachers are still generally not very well educated in this area. Traditional teaching methods are dominant in schools, and these are also preferred by teachers. The sample of teachers that participated in the above-specified research participated in workshops aiming at increasing the knowledge of teachers with IBSE before they implement the selected activities in their own teaching. However, even after taking part in several workshops and even with supporting methodological documents provided within the project (custom-made activities and prepared materials/sheets for teachers and pupils), the teachers still lack the competences required to properly apply IBSE in their teaching. The teachers do try to apply the inquiry-based approach in their lessons, to ask questions and support the independence of pupils, but they often have a tendency to answer the questions themselves and to have a very direct approach in the performed activities. Regarding the pupils themselves, they are also not used to this approach to teaching and often their expectations and active work do not correspond to the teachers' expectations. Pupils often expect the help of the teacher or clear instructions on how to process or what to do. This is related to the fact that traditional teaching methods (based on lectures) dominate in schools, and this is not only the case for the considered natural science subjects. We believe that these are the main reasons why the results did not indicate more significant changes. To obtain more convincing results, teachers need more permanent and systematic professional development, which will support greater applicability of IBSE in teaching, also in more subjects than those considered here. Still, we can say that the above analysis brought an interesting comparison of girls and boys in the perception of IBSE, showing a more positive impact on girls, who seem to have been more influenced by this form of teaching.

References

- Black, P. et al. (2006). Learning how to learn. *Research Papers in Education*, 2. pp. 119–132
- Champagne, A., Kouba, V., Hurley, M. (2000). Assessing Inquiry In Minstrell, J., & van Zee, E.H. *Inquiring into Inquiry Learning and Teaching in Science*. New York: American Association for the Advancement of Science.

- Elby, A. et al. (2011, December 5) *Epistemological Beliefs for Physical Science – EBAPS*. Available from http://www2.physics.umd.edu/~elby/EBAPS/EBAPS_items.htm
- ESTABLISH project (2013, August 2). Available from <http://www.establish-fp7.eu>
- Gago, J.M. (2004). *Europe needs more scientists*. Report by the High Level Group on Increasing Human Resources for S&T in Europe. Brussels, Belgium: European Commission.
- IMI - Intrinsic Motivation Inventory (2013, August 2) Available from <http://www.selfdeterminationtheory.org/questionnaires/10-questionnaires/50>
- Jenkins, E., W. (2006). The Student Voice and School Science Education, *Studies in Science Education*, 42, pp. 49–89
- Kekule, M., Žák, V., Ješková, Z., Kimáková, K., Ganajová, M., Kireš, M. *Inquiry-based science education and collecting evidence about its impact on students (Establish project approach)*, Proceedings of the 10th conference of the ESERA, 2–7 September 2013, Nicosia, Cyprus, In press.
- Lavnen, J., Byman, R., Juuti, K., Meisalo, V., Uitto, A. (2006, June 5). *Pupil Interest in Physics: A Survey in Finland*. Available from http://www.naturfagsenteret.no/tidsskrift/Nordina_205_Lavonen.pdf
- ROSE project - The Relevance of Science Education. (2015, January 12) Available from <http://roseproject.no/>
- Ryan, R.M., & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, pg. 68–78. Available from <http://www.selfdeterminationtheory.org/questionnaires/10-questionnaires/50>
- Sjøberg, S., Schreiner, C. (2006). How do students perceive science and technology?, *Science in School*, 1, pp. 66–69
- Taylor, P.C., Fraser B.J., & White, L.R. (1994). *CLES: An instrument for monitoring the development of constructivist learning environments*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.