

COOPERATIVE AND COMPETITIVE (BOARD) GAMES FOR THE DEVELOPMENT OF NON-COGNITIVE SKILLS

Valéria Juhász – Márta Radics

*(Dr. Valéria Juhász, associate professor of the Institute of Applied Humanities,
head of the Department of Hungarian and Applied Linguistics of SZTE JGYPK,
e-mail address: juhaszvaleria@jgypk.szte.hu;*

*Márta Radics, lecturer of the Institute of Special Needs Education of SZTE JGYPK,
e-mail address: radicsmarta@jgypk.szte.hu)*

THE ROLE OF NON-COGNITIVE SKILLS ON THE LABOUR MARKET AND IN EDUCATION

Technological innovations and information technology are developing so fast these days that many sectors of the economy can only react with significant delay. The sectoral and the trade structures of the economy are changing, too: new trades keep appearing, while existing ones are being transformed. Automation brings about the possibility that certain parts of human labour will be replaced by technology.

The Hungarian Chamber of Commerce and Industry conducted a research in 2016 concerning the effects of these changes on the labour market. Among many other questions they wanted an answer to this particular question: How many per cent of the labour force may be affected by automation? Out of 438 trades, 55 could be more or less immediately automated. In 2016 this meant more than half a million workers (513 433) (Nábelek et al. 2016).

More and more research concentrate on what kind of knowledge and skills the students of today will need to become effective labour force and successful adults in everyday life.

Automation has brought other novelties as well. The tasks within the trades have also changed, which in turn meant a change in the proportion and importance of tasks requiring non-cognitive skills (Schanzenbach 2016, Edin et al. 2017, Fazekas 2017). Autor et al. (2003) examined a 40-year-period (1960–2000) regarding the US labour market to see how the proportion of tasks requiring routine and non-routine physical, cognitive and social skills changed. They found that during that period the proportion of tasks requiring non-routine cognitive and social skills was continuously rising,

while the proportion of the routine and non-routine type of physical tasks and tasks requiring routine cognitive skills was continuously decreasing (Fazekas 2017: 8).

Deming's (2015/17) research of the 1980–2012 period slightly modifies this finding. The proportion of tasks that can be easily automated and considered cognitive routine tasks is continuously being decreased, in order to cut costs. In parallel, the proportion of tasks that require mathematical and scientific knowledge first increases, then stagnates; the proportion of tasks that require non-cognitive emotional-social skills and are connected to the service sector, continuously increases. The reason for this is that although robotics is becoming more and more widespread, so far it has not had an effect on tasks requiring higher cooperation skills and emotional intelligence.

The changes in trades create a shift in emphasis in what is required from employees: new skills will be needed.

The quantitative analysis of non-cognitive skills is quite difficult. There is no consensus among researchers regarding what to call the skills referred to as non-cognitive. Available literature uses expressions such as “character skills”, “soft skills”, while in OECD research they are referred to as non-cognitive or socio-emotional skills (Heckman et al. 2013, Heckman–Kautz 2012, OECD 2015a, b, Fazekas 2017). It is also hard to define the characteristic features of these skills. Economic analyses tend to use the ‘Big Five’ terminology. This divides human non-cognitive skills into five categories: Conscientiousness, Openness to experience, Extraversion, Agreeableness, and Neuroticism.

Economic research on non-cognitive competencies has shed light on the decisive role of parenting and family background, and the significance of early childhood development in life-long learning. The widespread effects of developing non-cognitive skills in (early) childhood, affecting all the economy and society, have also been proved. Non-cognitive skills measured in childhood have effects on performance at school, frequency of teenage pregnancy and the probability of smoking and criminal deeds, among others (Borghans et al., 2008, Bowles et al., 2001, Knudsen et al., 2007 quoted by Fazekas 2017: 12).

Longitudinal research has demonstrated that non-cognitive skills can be effectively developed at primary and secondary school, and even in adult education. According to impact assessments, development programmes with proper goals and with good implementation often bring about more serious changes than other measures aiming at the development of students' cognitive skills (Heckman–Kautz 2013, Losel–Beelmann 2003 quoted by Fazekas 2017).

The development of students' non-cognitive skills requires a different type of knowledge and motivation from the teachers. It is important how the teachers activate their students' imagination, cooperative skills, cultural tolerance, stamina and perseverance. There are more and more initiatives that have an effect on educational methodology in order to improve non-cognitive skills.

The PISA tests, measuring mathematical skills, reading comprehension and knowledge in sciences, have been supplemented with tests which measure general competencies to assess if the students can cooperate successfully with people of different cultural backgrounds, for example (Whitehurst 2016, OECD 2015a). The ability to evaluate and select information is also very important, that is, how the young deal with the information flow coming from the media.

The structure of Hungarian education and the methods employed (in the mainstream) have not changed for almost decades. However, alternative solutions, where technologies are used intensively and the teachers' roles are closer to that of 'mentors', have proved to be effective in improving critical thinking and communication skills, for example (Malek et al. 2014 quoted by Bartha-Sáfrányiné 2018).

Non-cognitive skills can be effectively developed in education with game pedagogy. In the following, it will be shown how (board) games are used in the Hungarian public education, and what kind of skills can be developed with their help (either when integrated into the lessons or as after-school activities).

USING (BOARD) GAMES IN EDUCATIONAL PROGRAMMES

It seems that games chosen freely only appear in free-time activities, for example in breaks and P.E. lessons. Within the framework of a school, it is not easy to establish a real game situation in which the students' freedom exists and educational tasks and pedagogical objectives are realised indirectly. Due to lack of time, knowledge or idea, it is challenging for teachers to cover the curriculum with the help of games. This requires creativity, experience, knowledge of game-based pedagogy and of various games on the part of the teacher. In the following, some of the good practices used in Hungary will be presented.

The Hejőkeresztúr Model is built on three main programmes: Complex Instruction Programme, Logical Board Game Programme and the Dialogue between Generations Programme. The students participate in logical and board game activities on a compulsory basis during school lessons, and on a voluntary basis in after-school activities. The main aim of these activities is to make the students sensitive to problems and to teach them problem-solving skills and to make them participate actively in the teaching-learning process. According to K. Nagy (2014), the real motivation for the students comes from a sense of achievement. They all feel and know they are able to solve every task, and the school is responsible for making them feel this way. Besides, these activities involving board games make the children understand that performance can be improved with hard work. Their personality develops in many ways: board game activities develop both cognitive and non-cognitive skills (K. Nagy 2014: 13).

In 2012, the European Parliament issued a declaration promoting the introduction of chess in schools. Soon after, Judit Polgár, a world-famous Hungarian chess champion, elaborated a new chess framework curriculum for the first four grades, to develop certain skills. Chess has been a new, optional subject in the National Core Curriculum since 2013. The Chess Palace Educational Programme creates an interdisciplinary connection among chess, logics and certain areas of informatics. Through the game structure of chess, this subject focuses on educational, developmental and teaching areas at the same time. On the website of Chess Palace, Judit Polgár emphasises that in the digital society, with its changed data processing, it is indispensable to acquire certain competencies, which is possible through the use of strategic board games (sakkpalota.hu).

In Budapest, in Városligeti Magyar–Angol Két Tanítási Nyelvű Általános Iskola (Városliget Hungarian–English Bilingual Primary School), Zoltán Papp (2016) teaches a three-hour-long class called ‘Strategic Game Club’ once a week. He claims that it is hard for board games requiring face-to-face interaction to compete with computer games. While in computer games it is possible for the child to attack his/her opponent continuously, to do so in person, against a peer, and to withstand the peer’s attack, is a mental burden. According to him, brilliant students cannot cope with failure, but with games this ability can be improved, along with their stamina and self-defence. This class builds on strategic and tactical games, during which situation analysis, assessment, evaluation and guess-work take place. The aim of the class is to present the children with demanding types of entertainment, where they will meet many decision-making situations.

In an East-Hungarian village, the Igazgyöngy Foundation operates Toldi Tanoda. It is an innovative initiation to compensate for the drawbacks of young people, relying on their voluntary participation and individual needs. It provides a complex service in personality development which would hardly be available (or not at all) for children who are less successful at school, and are living on the periphery of society (Fejes–Szűcs 2016: 13). Toldi Tanoda started its operation in 2013 and in five years their complex work had already tangible results: the academic performance of the students improved. In the beginning, there were four main activities: drama, craftsmen’s work, sport and (board) games.

Máté Lencse was the leader of the group playing board games. This activity can be followed on ped2.hu in the form of a blog. In the beginning, the games improved the children’s patience and created a culture of playing. Later, owing to the children’s motivation and curiosity, new objectives appeared, such as mathematical competence, communication development or increasing the motivation to read. At that time, the mentor chose the games according to the given goal. It was important that the children became familiar with many kinds of games and mechanisms (Jesztl–Lencse 2018).

According to Lencse, “working with games is indirect pedagogy, the developmental goals are not obvious to the children, and most of the items are additional. As a teacher, my task is to provide a framework, to get to know the children and to promote this process” (Lencse 2016: 101).

Pedagogical goals can be reached while playing games if the children can choose which game to play. This way the goals will surely be attained. While playing the games, the children’s social and cognitive skills noticeably develop. To trace this development, an 11-point record keeping method was elaborated:

- seeking challenges,
- following rules,
- awareness of their own gaming activity,
- focus,
- awareness of mathematical concepts,
- decision-making,
- risk taking,
- setting priorities,
- resource management,
- diplomatic skills,
- comprehension of communication signs.

Within these areas, 1 to 6 developmental levels were defined. After ‘class’, development is recorded according to areas and children, so their individual development can be traced (Jesztl–Lencse 2018).

SUMMARY

These days, as a result of technical development, more and more jobs become automated, new jobs and career types appear, and the proportion of tasks requiring social skills is increasing. Besides degrees and certificates, the value of non-cognitive skill such as cooperativity, stress tolerance, curiosity and creativity, is also increasing. Employers pay more attention to these skills. Longitudinal research has proved that non-cognitive skills can be effectively improved from primary school (Heckman–Kautz 2013, Losel–Beelmann, 2003 quoted by Fazekas 2017), so education and teaching have to adapt to the needs of the dynamically changing environment. The (board) game projects

implemented in Hungary are successful in the development of non-cognitive skills. Not only do the children's thinking skills improve, but also their behaviour and their interpersonal relations. Though the development of non-cognitive skills takes place in situations where games are played, the experience gained creates patterns and schemes that can be used in real life situations as well. The children practise how to cope with failure, how to do guess-work, they develop diplomatic skills and learn to analyse situations. All of this can be used effectively both at school and outside of it.

Bibliography

- Autor, D. H. – Levy, F. – Murnane, R. J. (2003) The skill content of recent technological change: An empirical exploration. *The Quarterly Journal of Economics*, 118/4. 1279–1333. <https://doi.org/10.1162/003355303322552801> (downloaded: 2019. 03. 15.).
- Bartha Z. – Sáfrányiné Gubik A. (2018) Oktatási kihívások a technikai forradalom tükrében. *Észak-magyarországi Stratégiai Füzetek*, 15/1. 15–29. https://matarka.hu/koz/ISSN_1786-1594/vol_15_no_1_2018/ISSN_1785-1594_vol_15_no_1_2018_015-029.pdf (downloaded: 2019. 06. 10.).
- Borghans, L. – Duckworth, A. L. – Heckmann, J. J. – Ter Weel, B. (2008) The economics and psychology of personality traits. *Journal Human Resources*, 43/4. 972–1059. <https://doi.org/10.1353/jhr.2008.0017> (downloaded: 2019. 03. 15.).
- Bowles, S. – Gintis, H. – Osborne, M. (2001) The determinants of earnings: A behavioral approach. *Journal of Economic Literature*, 39/4. 1137–1176. <https://www.umass.edu/preferen/gintis/jelpap.pdf> (downloaded: 2019. 03. 15.).
- Deming, D. J. (2015/2017) *The growing importance of social skills in the labor market*. NBER Working Paper Series. Working Paper, 21473. <https://doi.org/10.3386/w21473> (downloaded: 2019. 03. 15.).
- Edin, P. – Fredriksson, P. – Nybom, M. – Öckert, B. (2017) *The rising return to non-cognitive skill*. IZA DP No. 10914. <http://ftp.iza.org/dp10914.pdf> (downloaded: 2019. 03. 15.).
- Fazekas K. (2017) *Nem kognitív készségek kereslete és kínálata a munkaerőpiacon*. Budapest: MTA Közgazdaság- és Regionális Tudományi Kutatóközpont Közgazdaságtudományi Intézet. <http://econ.core.hu/file/download/bwp/bwp1709.pdf> (downloaded: 2019. 03. 15.).
- Fejes J. B. – Szűcs N. (2016) A tanodaszféra és a TanodaPlatform kapcsolódási pontjai. In Fejes J. B. – Lencse M. – Szűcs N. (szerk.) *Mire jó a tanoda? A Tanodaplatform keretében összegyűjtött innovációk, kutatások, történetek*. Szeged: Motiváció Oktatási Egyesület. https://motivaciomuhely.hu/wp-content/uploads/2016/04/Mire-j%C3%B3-a-tanoda_webfinal.pdf (downloaded: 2019. 03. 15.).
- Heckman J. J. – Humphries, J. E. – Kautz, T. (2013) *The Myth of Achievement Tests: The GED and the Role of Character in American Life*. Chicago: University of Chicago Press. <https://doi.org/10.7208/chicago/9780226100128.001.0001> (downloaded: 2019. 03. 15.).

- Heckman, J. J. – Kautz, T. (2012) Hard evidence on soft skills. *Labour Economics*, 9/4. 451–464. <https://doi.org/10.1016/j.labeco.2012.05.014> (downloaded: 2019. 03. 15.).
- Jesztli J. – Lencse M. (2018) *Társasjáték-pedagógia*. Budapest: Demokratikus Ifjúságért Alapítvány. <http://mek.oszk.hu/18800/18806/18806.pdf> (downloaded: 2019. 03. 15.).
- K. Nagy E. (2014) *Gondolkodásfejlesztés táblajátékokkal*. Budapest: Magyar Tehetségsegítő Szervezetek Szövetsége. http://tehetseg.hu/sites/default/files/konyvek/geniusz_33_net_teljes.pdf (downloaded: 2019. 03. 15.).
- Knudsen, E. I. – Heckman, J. J. – Cameron, J. – Shonko, J. P. (2006) Economic, neurobiological, and behavioral perspectives on building America's future workforce. *Proceedings of the National Academy of Sciences*, 103/27. 10155–10162. <https://doi.org/10.1073/pnas.0600888103> (downloaded: 2019. 03. 15.).
- L. Ritók N. (2017) Toldi Tanoda. *Heti Világgazdaság*, hvg.hu <https://nyomorszeleblog.hvg.hu/2017/08/06/589-toldi-tanoda/> (downloaded: 2019. 03. 15.).
- Lencse M. (2016) Társasjátékok és kulcskompetenciák. In Fejes J. B. – Lencse M. – Szűcs N. (szerk.) *Mire jó a tanoda? A Tanodaplatform keretében összegyűjtött innovációk, kutatások, történetek*. Szeged: Motiváció Oktatási Egyesület. https://motivaciomuhely.hu/wp-content/uploads/2016/04/Mire-j%C3%B3-a-tanoda_webfinal.pdf (downloaded: 2019. 03. 15.).
- Losel, F. – Beelmann, A. (2003) Effects of child skills training in preventing antisocial behavior: A Systematic Review of Randomized Evaluations. *Annals of the American Academy*, 587/1. 84–109.
- Malek, N.P. – Hall, J.C. – Hodges, C. (2014) *A review and analysis of the effectiveness of alternative teaching methods on student learning in economics*. No 14–27, Working Papers from Department of Economics, West Virginia University. <https://econpapers.repec.org/paper/wvuwpaper/14-27.htm> (downloaded: 2019. 03. 15.).
- Nábelek F. – Sturcz A. – Tóth I. J. (2016) *Az automatizáció munkaerő-piaci hatásai. Járás munkakerő-piacok automatizációs kitettségének becslése*. Budapest: MKIK Gazdaság- és Vállalkozáskutató Intézet. MKIK GVI Kutatási Füzetek. 4.
- OECD (2015a) *Fostering and measuring skills: Improving cognitive and non-cognitive skills to promote lifetime success*. OECD Education Working Paper, No. 110. [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP\(2014\)9&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP(2014)9&docLanguage=En) (downloaded: 2019. 03. 15.).
- OECD (2015b) *Skills for social progress: The power of social and emotional skills*. Paris. OECD. http://www.keepeek.com/Digital-Asset-Management/oecd/education/skills-for-social-progress_9789264226159-en#page3 (downloaded: 2019. 03. 15.).
- Papp Z. (2016) Stratégiai-taktikai társasjátékok az iskolában. *Új Köznevelés*, 72/10. <http://folyoiratok.ofi.hu/uj-kozneveles/strategiai-taktikai-tarsasjatekok-az-iskolaban> (downloaded: 2019. 03. 15.).
- Polgár J. (é. n.) *Sakk Alapítvány (PJSÁ)* honlapja <https://www.thejpcf.com/index.php/hu/tevenysegek/oktatas> (downloaded: 2019. 03. 15.).

- Roberts, R. D. – Martin J. E. – Oлару G. (2015) *A rosetta stone for non-cognitive skills. Understanding, assessing, and enhancing noncognitive skills in primary and secondary education*. Asia Society-Professional Examination Service, http://asiasociety.org/files/A_Rosetta_Stone_for_Noncognitive_Skills.pdf (downloaded: 2019. 03. 15.).
- Schanzenbach, Whitmore D. – Nunn, R. – Bauer, L. – Mumford, M. – Breitwieser, A. (2016) *Seven facts on non-cognitive skills from education to the labor market*. Washington: The Hamilton Project, Brookings Institute, Economic Facts. http://www.hamiltonproject.org/assets/files/seven_facts_noncognitive_skills_education_labor_market.pdf (downloaded: 2019. 03. 15.).
- WEF (2015) *New vision for education: Unlocking the potential of technology*. World Economic Forum, Switzerland. http://www3.weforum.org/docs/WEFUSA_NewVisionforEducation_Report2015.pdf (downloaded: 2019. 03. 15.).
- WEF (2016) *New vision of education: fostering social and emotional learning through technology*. World Economic Forum, Switzerland. http://www3.weforum.org/docs/WEF_New_Vision_for_Education.pdf (downloaded: 2019. 03. 15.).
- Whitehurst, G. J. (2016) Grading soft skills: The Brookings Soft Skills Report Card. *Evidence Speaks Reports, 2/4*. Brookings Institute, https://www.brookings.edu/wp-content/uploads/2016/12/es_20161215_whitehurst_evidence_speaks.pdf (downloaded: 2019. 03. 15.).