CIVILIA
ODBORNÁ REVUE PRO DIDAKTIKU SPOLEČENSKÝCH VĚD

Assessing self-awareness in career choice decisions among prospective Engineering students

Zita MANGNÉ KARDOS, Éva KOVÁCS

Abstract: Choosing a degree programme in higher education is one of the most important milestones in our lives. At this age, many people already have an occupation, but most of them have a school-leaving certificate attesting to the completion of a general secondary education. To facilitate this choice, the National Curriculum provides for career guidance as an important area for development in both primary and secondary education. The role of school is indisputable in further education and successful participation in the labour market. Interest and self-awareness play a key role in motivation to learn and reducing early school leaving. The success of a career choice decision is largely determined by career maturity (Rókusfalvy, 1969), the lack of which can result from a lack of adequate self-awareness (Zakar, 1988). They can also lead to overall career uncertainty (Völgyesy, 1976). In our research, we attempted to assess whether high school graduates interested in tertiary-level technical education made a decision that was appropriate to their orientation, self-awareness, and career knowledge. The study presents the results of a survey among high school graduates interested in technical education at the University of Pécs. One important aspect of the questionnaire used for the measurement was to assess the socio-economic status of the survey participants, their chosen degree programmes, their motivations for choosing a major and an

institution. The other important aspect was to present a comparative study of different production fields, such as interests, work environments, job knowledge by using Holland's Code and Super's Work Values Inventory questionnaires.

Key Words: Career choice decision, Self-awareness, Interest, Technical higher education, Career orientation

Introduction

Knowledge capital is a fundamental criterion for the efficiency, effectiveness and competitiveness of the knowledge economy and knowledge society. For this reason, the production, reproduction, and distribution of knowledge capital as an added value has become a priority. These tasks are primarily carried out by education. Higher education has been confronted with new challenges: tertiary education, previously considered elite, has become horizontally stratified, and many people have the opportunity for intra-generational mobility. At the same time, new trends have emerged in the labour market, with the disappearance of certain professions and the emergence of new ones to meet new challenges, particularly in knowledge-producing sectors. The rapid pace of change is reflected in the fact that the relevance of knowledge changes so rapidly that it can be considered obsolete even before the end of the training. Under the auspices of lifelong learning, adjustment and upgrading knowledge can be performed. The paradigm shift in higher education is reflected in the fact that supply-driven education is now being pushed by market demand, complemented by local and regional needs, cooperation with industrial partners in research and development, and the appreciation of adult learning (Besenyei, 2009).

Even though the decision to choose a degree programme is no longer necessarily a final one, it can still play a significant role in the future path of young people. The process of choosing a career is a search process, which can take several years. Besides acquiring information, the young individual is influenced by their social environment, parents, teachers, friends, and schoolmates, depending on their social background throughout

this process. According to Halász (2001), parental aspiration, which depends on their own education and experience, is of crucial importance, as parents generally want their children to gain a better education and thus a more advantageous position in the labour market and significantly better living conditions. Zakar (1988) argues that in this process of self-actualisation, the individual tries to make optimal use of their own potential, integrate effectively and actively into the process of division of labour and adapt to their working environment. As the transition to adulthood has become more protracted, committing oneself to a career has also become more uncertain (Somlai, 2010). The lack of information available to young individuals to make the right choice makes it difficult to choose from the many options available, and many young individuals experience the so-called 'Quarterlife Crisis'. This is an age-related crisis during which the career choice is not well thought through and the student only starts to reassess whether they have chosen the right career when nearing the completion of the graduate degree or when graduating (Lukács, 2007). When choosing an appropriate career in terms of quality, the degree of development of personality factors needs to be assessed. In preparing for a career choice, it is necessary to identify the personality traits on which a job role based on good self-assessment can be built (Szilágyi, 2003). Super (1968) uses the concept of career development instead of career choice, which is a lifelong process and encompasses work-related aspects. In his view, career development is a process of self-definition and self-development, in which abilities and interests are clarified and the way of understanding the world is shaped in close interaction with the environment. Self-definition is initially formed in the family environment and then transformed into various professional situations. Thus, both career development and the development of self--definition are the results of interactions between various individual and socio-cultural factors.

The choice of higher education institutions in Hungary is characterised by the densification of the catchment areas and the concentration of higher education in Budapest. Rural universities attract young people wanting to continue their studies from the surrounding regions. These universities can also ensure their placement in the labour market

(Teperics-Dorogi, 2014). However, in addition to regional location, the nature of the institution and the specificity of the course also play a crucial role in the learning mobility of young people entering higher education. These can be due to the fact that although more general courses are strongly affected by regional effects, the same effects cannot be applied to more specific courses (Rechnitzer-Smahó, 2007). As for the students' expectations, several factors have emerged in recent years that had not been considered before. In the past, the reputation of the higher education institution, the academic values of the teaching staff and the quality of the lecturers were considered to be decisive factors (Rechnitzer-Hardi, 2003; Kiss, Tagai & Telbisz, 2008), nowadays the distance of the place of residence from the higher education institution, the quantity and quality of services provided by the institution, such as the dormitory, language training, the cost of living, entertainment and cultural opportunities, future job prospects, the economic development of the region and the availability of service providers, have become important factors (Rechnitzer-Hardi, 2003).

To maintain economic competitiveness, it is essential to stay at the forefront of R & D & I areas, as they provide the highest added value to strengthen the position in the value chain and thus enable companies to play an increasingly important role in global production. We can also experience a major restructuring in the labour market due to the fourth industrial revolution. Demand for less skilled jobs is declining, while demand for skilled jobs, especially those requiring digital skills, is soaring (Szalavetz, 2018). This has a tremendous effect on the education system, particularly affecting young people who want to continue their education. According to Palcsok (2018), this has led to an increase in demand for engineering and IT courses in recent years. However, this does not seem to be enough, as a 2016 EMMI study shows that the labour market demand for STEM graduates exceeds supply, to an extent that it is already threatening the stability of the economy. High drop-out rates are exacerbating the situation. High-achieving students tend to choose other higher education courses, while STEM courses are not very popular. There is no real competition for entry and the oversubscription rate is not high. According to the 2020 admission statistics, 42.54% of

applicants in STEM fields started their studies in engineering, 35,17 % in IT and 22.29% in science.

One possible way to alleviate the shortage of professionals and increase the number of applicants to STEM fields is to attract women into these disciplines. Higher education typically has a higher participation rate of female students. According to the 2019 KSH (the Hungarian Central Statistical Office) survey, the proportion of female students was 51,5 %, compared to 48,5 % for men. When looking at the distribution of disciplines, a much more detailed picture is revealed. In engineering, female participation is only 26,6 %, in contrast to 73.4% of male participation, and in computer science the proportion is even more disparate, with women representing 15,8 % compared to 84,2 % of men. In science, the figures are much more evenly balanced, with 49,4 % of female participation compared to 50,6 % of male participation. However, low female participation rates are a problem in other OECD countries too (OECD PISA, 2006).

To successfully bridge this problem, several obstacles need to be overcome simultaneously. The low level of female participation in technical education might be the result of traditional societies. Gender roles and stereotypes are already present in their childhood socialisation, which pushes them towards more traditional, 'feminine' occupations from an early age. The „hidden curriculum" and gender-neutral education also favour boys, while girls are not encouraged to orient themselves towards scientific and technical fields (Pető, 2018). The phenomenon of the glass wall, which is in fact the horizontal segregation of women, channels women into certain fields that are now feminised, while the glass ceiling, the vertical segregation of women, is a barrier to their career progression (Takács, 2020). Despite the feminisation of higher education, few women choose to pursue STEM fields. For those women who do manage to break through the glass ceiling, the cold, chilly climate that characterises the communication and business environment of the typical male world is a further challenge. Many leave the profession, foregoing career opportunities and turning to more feminine professions (Britton, 2017; Séllei, 2015).

1 Description of the research

Our study was conducted among senior high school students interested in technical education at the University of Pécs in December 2021 and February 2022. The measurements were carried out using a self-developed questionnaire. The sample size (N) was 146, of which 95 were males and 51 females. The sample cannot be considered statistically representative, but as all the respondents are interested in MTMI disciplines, it is suitable for analysing the motivations, interests and value preferences.

1.1 Socio-economic studies

The first question of the questionnaire was designed to assess the programmes that the sample group would like to apply for. They were given the option of multiple choices when answering.

Figures 1 shows the interest in the programmes offered by gender, and Table 1 shows the order of preference for the programmes by gender. The table clearly shows that for males, computer science is by far the most popular discipline, with the other classical engineering disciplines i.e., electrical engineering, mechanical engineering, civil engineering and architecture being well behind, but chosen by roughly the same proportion of respondents. There are two types of higher-level vocational courses, Higher-level Vocational Training in Television production and in Engineering. The former programme is essentially a creative, artistic one, and 90 credits can be transferred when entering a bachelor's degree courses in Communication, Media, or Cinematography. The Higher--level Vocational Training in Engineering offering various specialisations is specifically designed to promote further studies in relevant undergraduate programmes, which are also provided at institutional level. However, only one male and two females were interested in it. It would be worthwhile to carry out further research to find out the reasons, as many people are not able to enter higher education due to the requirements of an advanced level school-leaving examination and a language examination. Thus, a higher-level vocational training could be a good opportunity for them to obtain a degree. This number is slightly bigger for the Higher-level Vocational Training in Television production, in

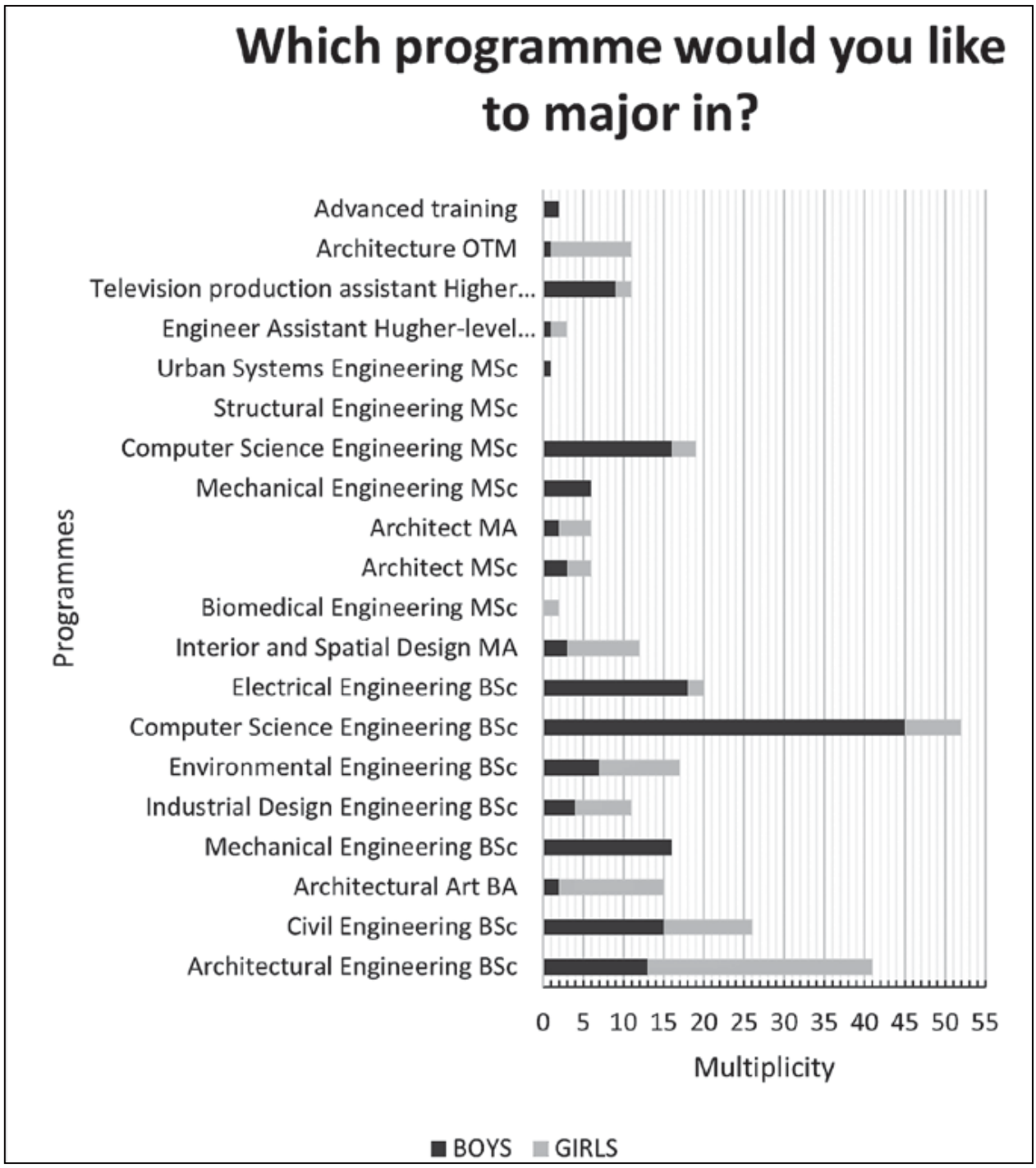

Figure 1: Interest in the programmes by gender.
Source: based on data from the 2021 and 2022 surveys.

which 9 males and 2 females are interested. Obviously, the most attractive programmes for females are Architecture and Civil Engineering, although the number of female students in Civil and Environmental Engineering is increasing. More „engineering" subjects such as electrical and mechanical engineering are no longer considered attractive at all.

Order of preference for the programmes	Males	Females
1.	Computer Science Engineering, Bsc. (45)	Architectural Engineering, Bsc. (28)
2.	Electrical Engineering, Bsc. (18)	Architectural Artist BA (13)
3.	Mechanical Engineering, Bsc. (16) Computer Science Engineering, Msc. (16)	Civil Engineering, Bsc. (11)
4.	Civil Engineering, Bsc. (15)	Environmental Engineering, Bsc. (10), Architect (undivided training offering a master's degree) (10)
5.	Architectural Engineering, Bsc. (13)	Interior and Spatial Design BA (9)
6.	Television production assistant Higher-level Vocational Training (9)	Interior and Spatial Design, Bsc. (7), Computer Science Engineering, Bsc. (7)

Table 1: Order of preference for the programmes by gender.
Source: based on data from the 2021 and 2022 surveys.

Since the 1980 s, sociologists have been researching and studying with particular attention the changing trends of the young generation, which have several historical antecedents. With the rise of child-centred education, young people have become more and more independent, the stages of their lives have undergone major changes, and the age of education, family formation and independent adulthood has been postponed as youthhood has been protracted. The career choice decision is one of the most important milestones in an individual's life, significantly influencing the course of their active career. A wide range of factors need to be

considered when deciding, such as individual professional interests, the encouragement of family, relatives, friends, the prestige of the higher education institution, the distance between the place of residence and the higher education institution, future job and earning opportunities, other people's opinions, and personal experiences. In our survey, we divided the assessment of this into two separate parts. Regarding the choice of the programme, we wanted to know which persons had the greatest influence on the respondents' decision making on their career.

To assess the motivations for choosing a career in engineering, we examined the motivations most probably leading the target group to choose a profession. We measured agreement with seven attitudinal statements (individual choice, parents, siblings, teachers, relatives and acquaintances, schoolmates and friends, others) on a five-point Likert scale.

The respondents marked 1 for „not at all influenced" and 5 for „totally influenced".

The mean average scores of those who influenced the respondents' career choice on a five-point Likert scale are shown in Figure 2.

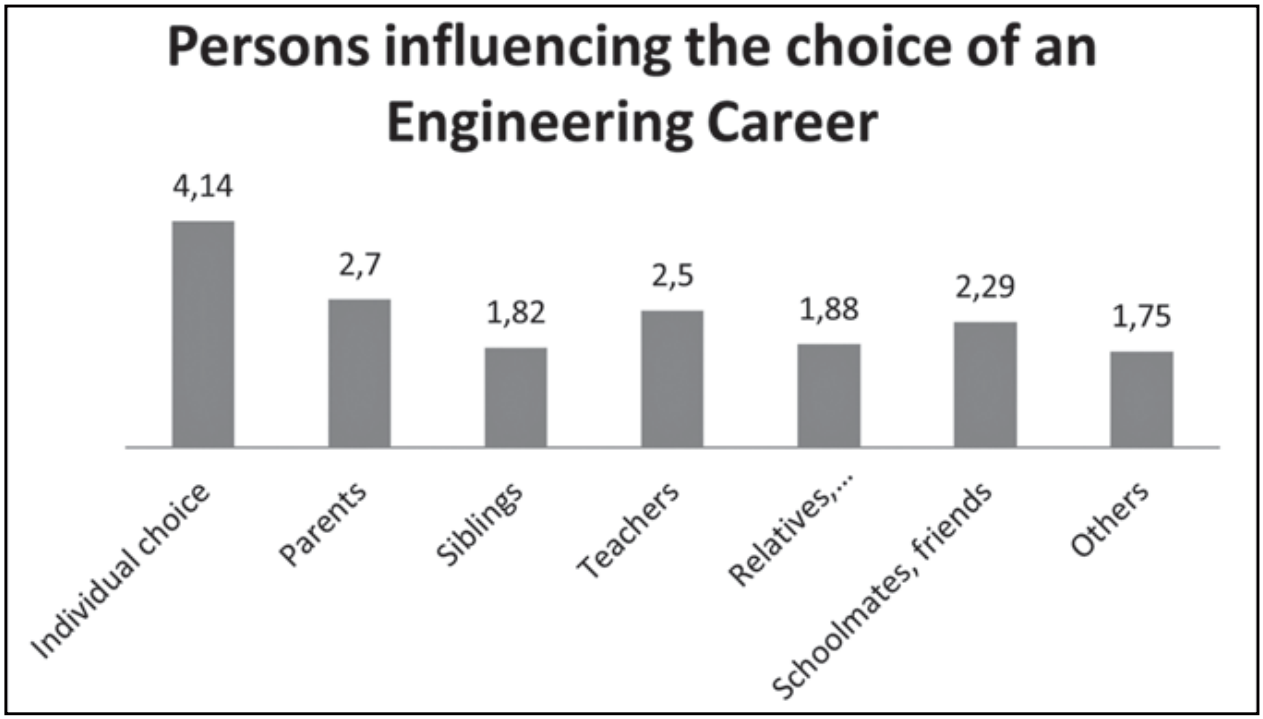

Figure 2.: Persons influencing the choice of an engineering career, mean average values.
Source: based on data from the 2021 and 2022 surveys.

The graph clearly shows that self-interest and individual motivation were more important, while the influence of parents, teachers and schoolmates contributed significantly less to the outcome of their choice. Self-awareness plays a key role in the process of career development, including knowledge of acquired skills, abilities, skills, interests, and factors influencing social integration (Keményné, 1989). In the process of shaping a life path, self-image predicts one's successes and failures. It is therefore of vital importance to develop and constantly review it. Whilst choosing a secondary school is obviously driven by an early stage of curiosity and a desire for adulthood, self-image and reality do not yet play a major role (Ginzberg et al., 1951), and the parental influence is crucial. They are the role model for their children (Csirszka, 1966), but four or five years later, when young individuals apply for higher education, the parental role is already preceded by individual choice and the realisation of self-image. According to Völgyesy (1976), the development of career interest starts only during the secondary school years and career guidance plays a major role in this process.

It must be seen that career choice is a decision-making process that is refined and developed over the years, and influenced by experience, personality development and environmental impacts. Career maturity is the result of the identification with career knowledge and self-awareness (Rókusfalvy, 1969). Career development and the development of self--definition are shaped by the interactions between the individual and their socio-cultural environment (Szilágyi, 2003), and knowledge and experience shape the future career image (Szentes, 2016). In his developmental theory Super (1971, in Szilágyi, 2003) emphasises that vocational development is part of and parallel to personal development, with 15–24-year-olds in the discovery stage. During the softening phase in secondary school, young individuals already have an idea of the different training programmes and professions. Thus, along the lines of curiosity, inclinations, and aptitudes, they try out this self-image in selected professional fields in higher education, or as Super calls it, in the transition phase.

The choice of higher education institution has a significant impact on the life course of prospective students, as it can project not only their

financial situation but also their future place of residence and social relations (Galotti-Mark, 1994). Csuka and Banász (2014) found that several aspects contributed to this choice. For example, the socio-economic situation of students, the educational attainment of parents, expected costs, the career advice of relatives and acquaintances, as well as the location and ranking of the institution among higher education institutions, its prestige, infrastructure, and quality of education.

The second question of our study in this area was to find out which criteria played a role in the choice of higher education institution. To assess the motivation for choosing an institution, we looked at the motivations that the target group was assumed to be driven by. We measured agreement with seven attitudinal statements (geographical distance, quality of training, diversification of training, university and faculty reputation, opportunities for further training, good employment opportunities, others) on a five-point Likert scale.

The respondents marked 1 for „not at all influenced" and 5 for „fully influenced".

Figure 3 shows the mean average value of respondents' answers to each attitude. It can be concluded that the target group primarily considers the quality of the training provided by the institution to be important, but a significant factor is the opportunities for upgrading, the reputation of the university and the faculty, and good employment opportunities. Quality encompasses several aspects. Quality education is a sign of efficiency, effectiveness, and equity (Lannert, 2004). The economics of efficiency reflects the return on investment or the maximisation of benefits. This can be achieved in two ways, on an accrual or a cash basis: in the former case, the aim is to achieve the maximum result with all available resources, while in the latter case, the aim is to achieve a given output with the minimum use of resources (Hausmann, 2009). In higher education terms, it means providing the student with quality education - even at the cost of financial sacrifice - that will give them a marketable degree. In assessing effectiveness, we also need to consider drop-out rates, the number of graduates and job opportunities (Csuka-Banász, 2014). The issue of equity has come to the fore with the massification of higher

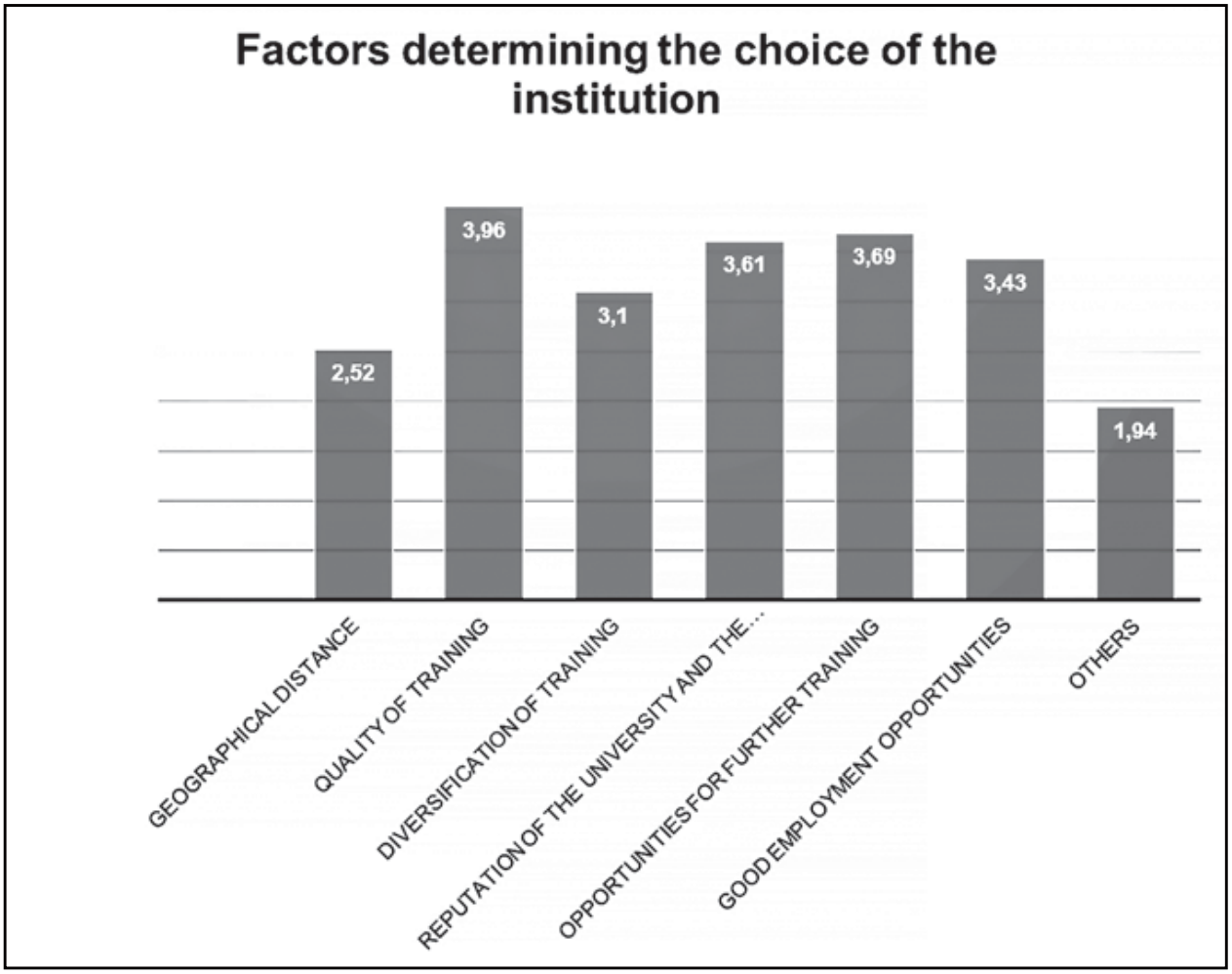

Figure 3: Factors determining the choice of the institution, mean average values.
Source: based on data from the 2021 and 2022 surveys.

education. Higher education, previously considered 'elite', has opened its doors to many social groups who previously had no chance of accessing tertiary education. These groups of students are identified in the international literature as atypical groups and the scope of the concept is quite broad. They include low-status persons from disadvantaged or severely disadvantaged backgrounds, persons with disabilities, working women with families, older generations, and immigrant students (Tőzsér, 2012).

The need for quality education has therefore increased significantly, with usable, marketable knowledge determining the labour market participation of young graduates. With the generalisation of a lifelong learning approach, young people also want to improve their labour market position and have a „flexicurity" to avoid unemployment and change jobs. They

are the generation that is trying to „wear several hats", prepared to identify with the ever-changing labour market expectations. The possibility of further training is therefore important for them, thereby increasing the value of their qualifications. The reputation of the university and faculty is also linked to quality, since for many people it is presumably a status symbol to obtain a degree from a particular higher education institution. Geographical distance was a relatively low motivator for the group surveyed, presumably because the university's educational offer is a good attraction for secondary school students living in and around the county.

1.2 Career guidance studies

In our further study, we used two questionnaires (Holland, Super), applied in career guidance counselling for decades, to examine the interest and work value orientation of the sample group.

The first questionnaire, the Holland Code (RIASEC) Career Test, was developed by J. L. Holland in the 1970 s as a result of many years of research. His model was originally developed for vocational training in the United States but is now widely used in today's career guidance systems.

The first stage of self-discovery is the identification of interests. Interests can be observed from early childhood, as the child selects the things they find particularly interesting from the environment surrounding them and thus develops an emotional attachment to them (Budavári-Takács, 2012). However, the object of interest may change over the years, largely due to the influence of the environment. The intensity of interest is also an important aspect, as we may be interested in something on a daily or weekly basis, or even much less frequently (Szilágyi, 2002). If we choose to do a job that we are interested in, the results are clearly more effective than if we just do it mechanically. Furthermore, if our competences are also appropriate to the chosen profession, our effectiveness can be multiplied. According to Holland, occupational interest reflects human preferences for the behaviours, situations and contexts in which one performs an activity or realises its outcomes. The personality traits play a decisive role in the success and satisfaction of individuals in their chosen occupations throughout their lives. Holland classified occupational interests into six types and organised them into a hexagon to create his

model. The six personality types were named Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E) and Conventional (C), and the model was known as RIASEC from the combination of the initials. Based on the attributes of the different personality types, the matching occupations can be identified with a good probability.

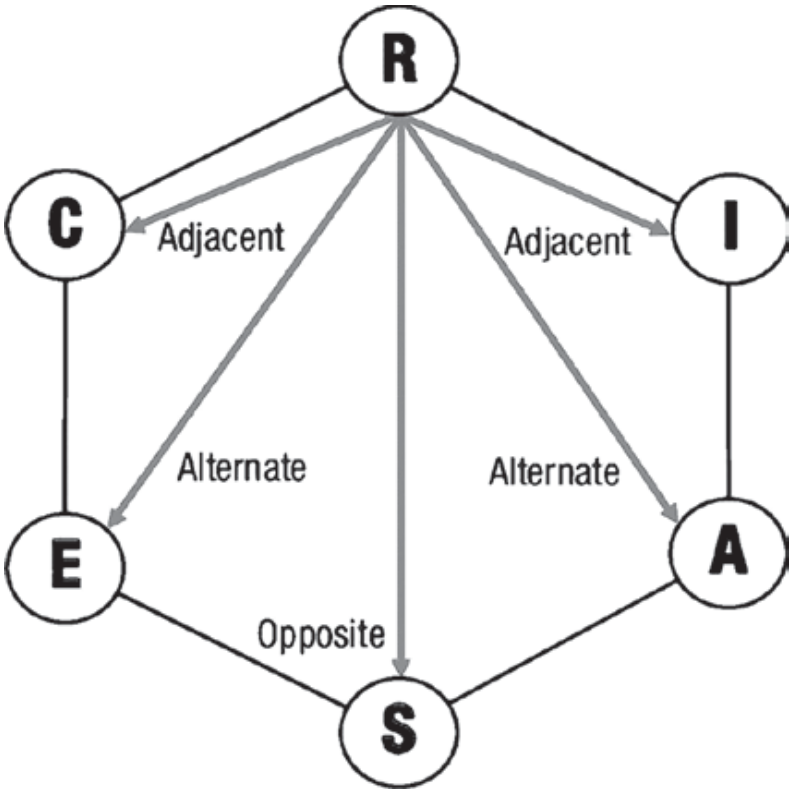

Figure 4: Holland's hexagon model and degrees of congruence.
Source: Nye et al., 2012.

The hexagonal placement of the six interest types is not a matter of chance; the distances between the personality types are inversely proportional to the degree of similarity between them. This means that the realistic, investigative and conventional personality types are adjacent to each other, i.e., they are most similar; the realistic, artistic and enterprising personality types are alternatives, with a medium degree of similarity, while the realistic and social personality types are opposite, i.e., they are not very similar. Several studies with large samples of US college students and unemployed adults have demonstrated the appropriateness of the personality types placed in the hexagon (Day & Rounds, 1998; Day, Rounds & Swaney, 1998).

It has also been observed that only a very small number of people are characterized by a single area of interest, most of us generally have many traits in common and a mixture of interests (Budavári-Takács, Kasik, 2014). Individuals within a given occupational group have similar personality traits, and therefore it can be assumed that they act similarly in given situations. Consequently, the performance and success of a person with a given interest in each job group can be relatively well described (Antalovits, 2002).

Holland (1997) also proposed six types of work environments according to the RIASEC interests, arguing that people are attracted to work environments that match their interests. He also argued that individuals' work attitudes and behaviours are influenced by similarities between interests and environments. This means that they are more satisfied, successful and persistent in an environment that is congruent with their interests. He also emphasised that an individual's environment is rarely homogeneous, meaning that there are many different sub-environments, even within an organisation, which can affect the individual.

The classical engineering career falls into the realistic personality type. The realistic person is a masculine, emotionally stable, socially insensitive, present-oriented type. This type of person likes to work with machines and equipment and builds on his motor skills and dexterity in his work. He/she is not a communicative person but prefers mathematical tasks. We have shown above that it is the males are more likely to choose a classical engineering course, and for this reason we have separated the analysis of males' and females' personality types.

Table 2 shows the average mean scores, modes, medians and standard deviations for males' personality types.

In terms of average mean scores, the males are predominantly a conventional personality type. According to Holland, this type of person prefers clearly defined tasks that require meticulous attention to detail, follows the rules, adheres strictly to deadlines, requires top-down direction and a habitual, steady-state approach. As this type is strict about meeting deadlines, they do not like to leave a task half started. For people with this personality type, Holland recommends administrative, legal and business jobs.

	Mean	Mode	Median	Standard deviation
Realistic	11,377	16	14	3,48
Investigative	14,189	13	14	3,22
Artistic	13,716	16	14	3,43
Social	12,916	12	13	3,52
Enterprising	14,105	14	14	3,31
Conventional	14,75	18	15	3,61

Table 2: Average mean scores, modes, medians and standard deviations for personality types for males.
Source: based on data from the 2021 and 2022 surveys.

The second personality type for males is the investigative one. These people are interested in learning about the world, exploring and looking for connections and doing scientific research. Therefore, they are recommended to take up technical or scientific careers. Although the personality type primarily suited to engineering occupations, the realistic, comes last, it shares similar personality traits with the investigative type in terms of hexagonal positioning. As a result, the career orientation of males can be said to be in the right direction, and they can be steered towards engineering careers with the help of appropriate career guidance activities.

	Mean	Mode	Median	Standard deviation
Realistic	12,86	15	13	3,66
Investigative	12,94	14	14	3,76
Artistic	16,9	20	18	3,14
Social	13,59	15	14	3,56
Enterprising	14,39	14	14	2,97
Conventional	15,12	15	15	3,05

Table 3: Average mean scores, modes, medians and standard deviations for personality types for females.
Source: based on data from the 2021 and 2022 surveys.

Table 3 shows the average mean scores, modes, medians and standard deviations for females' personality types. The table on the order

of preference of courses shows that a very high proportion of females are mainly looking for arts programmes in engineering. In addition to classical engineering skills, the arts programmes place particular emphasis on the development of aesthetic skills, so it is not surprising that all the applicants are required to take a preliminary drawing competence exam. These programmes are particularly recommended for people with a creative personality type. The creative type tries to find new solutions based on previously acquired knowledge, skills and abilities, and likes to solve problems independently and creatively. Aesthetic and independence are important to them, as is the ability to express their emotions and themselves. Emotionally, they are highly intuitive and tend to rely on their feelings to make decisions, they feel the need to create. In terms of average mean scores, the females are predominantly a creative personality type, with a very high score of 16. 9. Their mode is the maximum score available, 20. Given that mode is the most frequent number in the sample, this is a very good result, as it shows that they fully meet the criteria for the personality trait. Also, in terms of median, the creative personality trait reaches the highest number, and since the median is the middle number that „cuts the population in half", it can be said that at least 50% of the sample scored 19 or 20 on this creative personality trait. The standard deviations for each personality type are slightly higher than those for males, with a difference between the lowest and highest value of 0. 79.

Donald Super's Work Value Questionnaire was first published in 1962, but he began his own study on career patterns (Career Pattern Study) in the 1950 s. The pioneering nature of his theory stems from the fact that he was the first to link the processes of developmental psychology, career choice, career adjustment and occupational activity, thus enabling the matching of personality and the world around the person. In his theses, he argues that people are suited to a wide range of careers because of their diversity, and that expectations, preferences and life situations are constantly changing, i.e., career choice and professional integration are not static but dynamic. This process is in fact a succession of different life stages, the stages themselves being growth, exploration, establishment, maintenance and decline. The stages can be further broken down

into sub-stages. The career model is determined by the socio-economic status of the individual, their skills, personality traits and professional opportunities. Professional development is a combination of self-concept and personality development, with skills, interests and professional roles evolving and developing, and self-actualisation.

The test group is in a life stage of discovery and a sub-stage of transition. By this time, young people have a firmly defined self-image, which they are trying to test in a professional field. This may mean taking up a job, taking part in higher education or both. Reality already plays a major role in their decisions. Super's Work Value Questionnaire contains 15 work values, using 45 items to clearly define them.

Table 4 shows the ranking of the work values by the average mean scores, modes, medians and standard deviations for males.

Work values	Average mean score	Mode	Median	Standard deviation
Economic return	12,17	13	13	2,55
Way of life	12,14	12	12	2,31
Variety	12,06	12	12	2,33
Independence	11,77	13	12	2,40
Creativity	11,25	9	11	2,58
Prestige	11,14	12	11	2,45
Associates	10,99	11	11	2,50
Intellectual stimulation	10,80	12	11	2,17
Altruism	10,58	11	11	2,86
Achievement	10,51	11	11	2,13
Supervisory relationships	10,43	10	11	2,59
Playfulness	9,72	11	10	2,30
Aesthetic	9,66	11	10	2,57
Management	9,58	10	10	3,04
Human values	8,93	8	9	2,58

Table 4: Ranking of the work values by the average mean scores, modes, medians and standard deviations for males.
Source: based on data from the 2021 and 2022 surveys.

Altruism, way of life and variety scored highest in the ranking of values, meaning that these people appreciate well-paid jobs for financial security, whether for now or in retirement, want to implement their individual ideas in their work and have a challenging, non-monotonous job. The results are similar when examining the modes and medians, with the difference that independence is ranked first next to economic return. The standard deviation of values shows similar results with no outliers. The work values ranking does not match their personality trait, as in their case achievement, supervisory relationships and management are congruent, however, these work values can be found in the bottom third.

We also examined the ranking of work values for females, as shown in Table 5.

	Average mean score	Mode	Median	Standard deviation
Creativity	13,37	15	14	1,67
Way of life	13,22	14	14	1,80
Variety	13,02	15	13	1,77
Economic returns	12,71	15	13	2,31
Aesthetic	12,37	13	13	2,31
Altruism	12,29	12	12	2,27
Intellectual stimulus	12,00	12	12	1,87
Associates	11,86	13	12	2,23
Independence	11,80	13	12	2,09
Prestige	11,76	15	12	2,59
Achievement	10,71	10	11	1,97
Supervisory relationships	10,65	11	11	2,64
Playfulness	9,25	9	9	2,23
Management	9,10	10	9	2,84
Human values	8,41	7	8	2,36

Table 5: Ranking of the work values by the average mean scores, modes, medians and standard deviations for females.
Source: based on data from the 2021 and 2022 surveys.

From the table we can see that four of the top one-third (5) work values show correspondence, with only some discrepancy in the

order. While for males, economic returns, i.e., jobs with good earning potential, is the most dominant value regarding future work, for females, creativity, i.e., the pleasure of creating, is the most important one. Way of life and variety are the 2nd and 3rd most important work values for both genders, meaning that it is important for both males and females to develop a lifestyle that is in harmony with their own vision, and that work activities provide pleasure and enjoyment and not just a task to be done. Independence, i.e., working at one's own pace and in one's own way, seems to be more important for males, is the 4th most important work value for them. For females, this work value is in the middle third, which means that it is not an important decision factor for them. Creativity ranks lower for males, but can be found in the top third, so it is obviously something they consider when looking for a job. Also in the bottom third, 4 of the 5 work values are identical for both genders, with one exception. It is worth noting that human values, i.e., thinking about the future and creating values for the future generation, are ranked last by both sexes. This could also be a generational phenomenon, as several studies have shown that today's young people think that their life is about themselves, they are not interested in the past, and care about the future only to the extent that they can realize their self-fulfilment and accomplish great things (Csehné, 2017). Also in the bottom third are supervisory relationships, i.e., work which is carried out under a supervisor that is fair and with whom one can get along; playfulness, i.e., work that is like playing a game; management, i.e., work which allows one to plan and lay out work for others, and for males, aesthetic, i.e., work which allows one to make beautiful things and contribute beauty to the world, and for females, achievement, i.e. work that gives one the feeling of accomplishment in doing a job well.

The same order can be established when evaluating based on modes. When examining the standard deviations of the values, relatively smaller values were obtained for females, and the values do not show any outliners either.

1.3 Relationship between personality types and work values

The determination of the work values associated with personality types was carried out by means of a correlation test, with the work values as dependent variables and the personality types as independent variables.

Table 6 shows the test for males, with the strength of the green colour indicating the strength of the correlation and hence the strength of the relationship, and the strength of the red colour indicating the absence of the correlation and hence the lack of the relationship.

	Realistic	*Investigative*	*Artistic*	*Social*	*Enter-prising*	*Conven-tional*
Intellectual stimulus	0,4238	0,6042	0,6252	0,4678	0,4671	0,5119
Altruism	0,3109	0,4391	0,6145	0,7411	0,4640	0,5595
Economic returns	0,4427	0,3668	0,3674	0,3802	0,4799	0,5188
Variety	0,4818	0,5073	0,5286	0,3705	0,4903	0,4881
Indepen-dence	0,4841	0,4809	0,5315	0,4126	0,5605	0,5305
Prestige	0,4135	0,3439	0,3450	0,3661	0,3624	0,4692
Aesthetic	0,2937	0,3730	0,6224	0,4936	0,2670	0,2813
Associates	0,3816	0,3747	0,3789	0,4115	0,4069	0,4979
Playfulness	0,3723	0,4028	0,4762	0,3419	0,2713	0,2969
Way of life	0,4966	0,5139	0,5786	0,4175	0,4321	0,4472
Supervisory relationships	0,3273	0,3773	0,3527	0,4517	0,3925	0,5032
Human values	0,4297	0,5446	0,6235	0,7964	0,5792	0,6099
Achievement	0,4486	0,5259	0,5565	0,5114	0,4562	0,5323
Creativity	0,5036	0,5578	0,6404	0,4762	0,4083	0,4178
Management	0,3567	0,316	0,3838	0,3411	0,6376	0,4347

Table 6: Pearson correlation test for males (Sign: $p < 0.001$).
Source: based on data from the 2021 and 2022 surveys.

It can be stated that the conventional personality type is characterised by an acceptance of human values, altruism, independence and achievement and a rejection of aesthetic and playfulness.

Table 7 shows the results for females, with the strength of the green colour indicating the strength of the correlation and hence the strength of the relationship, and the strength of the red colour indicating the absence of the correlation and hence the lack of the relationship.

	Realistic	*Investigative*	*Artistic*	*Social*	*Enter-prising*	*Conven-tional*
Intellectual stimulus	0,3526	0,2158	0,3655	0,0513	0,2163	0,1968
Altruism	0,1636	0,1587	0,0970	0,4572	0,4872	0,293
Economic returns	0,0863	0,1356	0,1919	0,2310	0,3608	0,1044
Variety	0,3184	-0,003	0,5254	0,0584	0,0934	-0,0152
Independence	0,3541	0,2877	0,3296	0,2097	0,4281	0,4118
Prestige	0,2131	-0,0240	0,2432	0,2021	0,4668	0,4138
Aesthetic	0,1629	-0,1858	0,6048	0,0849	0,0278	0,1045
Associates	0,1066	0,1322	0,1068	0,3715	0,4310	0,4322
Playfulness	0,0479	0,1446	0,0151	0,2561	0,2807	0,1045
Way of life	0,2925	0,0019	0,4773	0,0671	0,2338	0,2207
Supervisory relationships	0,2562	0,0600	-0,0310	0,1118	0,2697	0,4044
Human values	0,3196	0,4697	0,0812	0,5521	0,5381	0,3544
Achievement	0,4294	0,4111	0,2117	0,1591	0,2826	0,4512
Creativity	0,4380	0,1175	0,5061	0,1507	0,2394	0,1872
Management	0,3159	0,3954	-0,0594	0,2275	0,5841	0,1508

Table 7: Pearson correlation test for females (Sign: $p < 0.001$).
Source: based on data from the 2021 and 2022 surveys.

From the table we can establish that the creative personality type is characterised by the acceptance of the aesthetic, variety, creativity and way of life, and the rejection of management, supervisory relationships and playfulness. There is congruence between the primary personality

type for females and their work value preferences, i.e., the main characteristics of the creative personality type are consistent with the results obtained from the correlation. This means that the females in the sample know themselves well and have chosen the professional orientation that best suits them.

Conclusion

The specificities of the digital age predict economic opportunities on an unprecedented scale. Innovation processes are becoming faster and more complex, and the practical application of the knowledge generated by its acquisition will further boost economic efficiency and growth. The need for a knowledge-based society and human capital have become key to economic growth. The labour market is particularly sensitive to the new challenges. However, technological change also implies the need to change knowledge and competences. Innovative processes are becoming faster and more complex, and the practical application of the knowledge generated by its acquisition is making economic efficiency and growth more complex. The impact of these trends on the labour market will require future workers to adapt continuously. Consequently, the competences that the economy expects workers to possess are constantly changing. The basic criterion for the knowledge economy and the knowledge society is knowledge capital, i.e., the production, reproduction and distribution of added value, which is primarily the task of education. The need for quality education has therefore become much more important, with usable, marketable knowledge determining the labour market participation of young graduates. Therefore, career guidance is an important area, as it is the basis for successful further education and successful labour market participation. From the perspective of our research topic, we highlight the potential of human resources, both in terms of career choice/career development and the development of self-definition. It is the weight of the highly qualified segment of the labour market and the presence of an institutional system that adequately supports local imprints of innovative behaviour that can combine to facilitate this type of, or otherwise expected, career orientation.

Literature

BRITTON, D. M. Beyond the Chilly Climate: The Salience of Gender in Women's Academic Careers. *Gender & Society*, 2017, Vol. 31, Nr. 1, pp. 5–27.

BESENYEI, L. A felsőoktatás helye és lehetőségei az életen át tartó tanulásban (Új kihívások – paradigmaváltás). *VII. Nemzetközi Konferencia Miskolci Gazdaságtudományi Kar 2009*., pp. 270–277.

GALOTTI, K. M., MARK, M. C. How do high school students structure an important life decision? A short-term longitudinal study of the college decision-making process. *Research in Higher Education*, 1994, Vol. 35, Nr. 5, pp. 589–607.

GINZBERG, E., GINSBERG, S. W., AXELRAD, S., HERMA, J. L. *Occupational Choice: An Approach to a General Theory*. New York: Columbia University Press, 1951.

HALÁSZ, G. *Az oktatási rendszer*. Budapest, Műszaki Könyvkiadó, 2001.

KISS, J., TAGAI, G., TELBISZ, E. A szürkeállomány területi különbségei – katedrán innen és túl. *Területi Statisztika*, 2008, pp. 315–333.

KISS, Z. Fiatal magyar diplomások foglalkoztathatósága: Az első álláskeresési időt befolyásoló tényezők. In PUSZTAI, G., KOVÁCS, K. *Ki eredményes a felsőoktatásban?* Nagyvárad, Partium Press, 2015, pp. 55–65.

LANNERT, J., NAGY, B.A. nők helyzete a magyar tudományos életben. *Szociológiai Szemle*, 2011, Vol. 29, Nr. 4, pp. 63–82.

LUKÁCS, F. Egyetemisták és főiskolások pályaválasztási bizonytalansága és a pályakonzultáció. In PUSKÁS-VAJDA, Z. (ed.) *Felsőoktatásban tanuló fiatalok problémái, útkeresése, pályafejlődése a 21. század kezdetén Magyarországon*. Budapest: FETA Könyvek 2007, pp.85–103.

RECHNITZER J., HARDI, T. (eds.) *A Széchenyi István Egyetem hatása a régió fejlődésére. Tudományos Füzetek V. kötet*. Győr: Széchenyi István Egyetem Gazdaság- és Társadalomtudományi Intézete, 2003.

RÓKUSFALVY, P. *Pályaválasztás, pályaválasztási érettség*. Budapest: Tankönyvkiadó, 1969.

SÉLLEI, N. Professzornők a debreceni egyetemen. *Debreceni Szemle*, 2015, Vol. 3, pp. 260–277.

SZALAVETZ, A. Ipari fejlődés és munka a tudásalapú társadalomban. *Magyar Tudomány*, 2018, Vol. 179, Nr. 1, pp. 55–60.

SZILÁGYI, K. *Munka-pályatanácsadás mint professzió*. Budapest: Kollégium KFT, 2003.

TAKÁCS, I. Akadályok a nők karrierjének útjában – a szervezetek útvesztői, *METSZETEK*, 2020, Vol. 9, Nr. 1, pp. 25–44.

TŐZSÉR, Z. A „nem tradicionális“ hallgató. A nemzetközi szakirodalom tanulságai. Non- traditional students. Lessons from the international literature perspective. *Iskola-kultúra*, 2012, Vol. 1, Nr. 2, pp. 109–114.

VÁMOSI, T. A komplex vizsgával kapcsolatos tapasztalatok az iskolarendszerű duális szakképzésben. *JATES*, 2020, Vol. 10, Nr. 1, pp. 82–98.

VÖLGYESY, P. *A pályaválasztási döntés előkészítése*. Budapest: Tankönyv Kiadó, 1976.

ZAKAR, A. *Pályaválasztási elméletek*. Budapest: Tankönyvkiadó, 1988.

Kontakt na autorky příspěvku:

Zita Magné Kardos
Universität Pécs
Szántó Kovács János Str. 1/b
H-7633 Pécs
e-mail: mangne.zita@mik.pte.hu

Dr. Éva Kovács
Universität Pécs
Szántó Kovács János Str. 1/b
H-7633 Pécs
e-mail: kovacs.eva@mik.pte.hu