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CAREER INTEREST PREFERENCES, RANDOMNESS OF STUDY PROGRAM CHOICE, AND COMPETENCIES VS. ACADEMIC MAJOR RESELECTION

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Purpose: The paper aims to present a review of literature on key competencies related to the significance of education and skills in selecting studies. It also explores the factors considered in study major selection, including career preferences, choice randomness, and competencies possessed. The research aims to understand how study majors were selected and the satisfaction levels associated with those choices.
Design/methodology/approach: The research objective implementation was divided into two stages. The first stage involved an analysis of secondary sources, including a review of literature on the subject. The second stage entailed conducting a survey using an online questionnaire tool, which consisted of 133 questions about career interest preferences, 21 questions regarding competencies, 11 questions about the studies pursued, and a 4-question metric.
Findings: The research concluded that study majors were selected in accordance with the preferences and interests of the decision-making persons. It also found that those who made the decision independently or randomly were often dissatisfied, while those who made the choice with their preferences and with the influence of third parties were satisfied and would not change their decision.
Practical implications: Understanding the factors that lead to satisfaction or dissatisfaction in study major selection may help educators and counselors guide students more effectively.
Originality/value: Insight into the factors affecting the choice of the field of study and the relationship between decision-making processes and the level of satisfaction can provide valuable information for educators, career advisors, students and employers making decisions about their educational path.

Keywords: competence; professional preferences; professional interests; sustainable education.

Category of the paper: Research paper.

1. Introduction

This article focuses on selected factors taken into account during academic major decision making. The study entailed an attempted to determine the consistency of the major-selecting persons' interests and preferences, including identification of possible differences in an instance of academic major reselection, taking the preferred career interests, the choice randomness of the major currently pursued, and the competencies possessed into account. To implement the study, four research questions had been posed:

1. Is the selection of academic major made taking the major-selecting person's preferences and interests into account?
2. Are there differences in possible academic major reselection, assuming a possibility of decision remaking taking the major-selecting person's interests into account? Would the academic major selection be then the same or different?
3. Are there differences with respect to academic major reselection, assuming a possibility of decision remaking taking the manner in which the first selection was made into account?
4. Are there differences with respect to academic major reselection, assuming a possibility of decision remaking taking the major-selecting person's competencies into account?

Based on these questions, three research hypotheses were posed:

H1. The inclination to switch to another academic major is lower when the respondent's career preferences are compatible with the profession for the performance of which the major selected is intended, than the case of the respondent's career preferences' incompatibility with the profession for which the study major selected is intended.

H2. In an instance of academic major selection that was not preceded by analysis, the respondents are more inclined to correct their choice of the major, than in an instance of a major selection preceded by such analysis.

H3. The selection of an academic major does not depend on the selecting person's competencies.

This article focuses on selected factors taken into account in the academic major decision making, including determination of possible differences, in an instance of a potential major reselection, taking the preferred career interests, the choice randomness of the major currently pursued, and the competencies possessed into account.

2. Literature review

2.1. Sustainable education

Sustainable development is interconnected with the far-reaching technological progress and globalization. The subject literature pinpoints that the objectives of sustainable development are intended to counter the consequences of the globalization processes, which, so far, have not been much conducive to the harmonious development of civilization (Ferreira, 2017; Nowak, 2017).

The concept of sustainable development was first mentioned in 1980 in the World Conservation Strategy. One of the key events considered to constitute the onset of the idea of sustainable development, was the speech given by U Thant, the Secretary General of the United Nations, in 1968. A year later, the "Problems of the human environment" (also known as the U Thant Report) report was published. In addition to the aforementioned report, it is worth mentioning the Club of Rome's 1972 publication "The Limits to Growth", which attempted to determine human impact on the environment (Meadows et al., 1972; Lemkowska, 2020)

The very definition of sustainable development incorporates three aspects: the environment, economy and society. According to the report, sustainable development entails such manner and form of development which allows the needs of the present generation to be met without limiting the future generations' ability to meet their needs (Turner, 1988; Draghici, 2019).

One of the most important documents, considered an official interpretation of the society's further development, is the Action Program – Agenda 21, developed during the 1992 United Nations conference on the Environment and Development held in Rio de Janeiro. Education has been given special significance in this document (Rydz-Żbikowska, 2012; Douša, 2021). As Nowak M. (Nowak, 2017) notes in his study, education entails one of the conditions underlying and enabling sustainable development. Access to education has been one of the Sustainable Development Goals adopted on September 25, 2015.

The importance of education, which affects the level of competency, is also visible in the labor market. The changes brought about by the Industrial Revolution 4.0 have contributed to the fact that many companies are facing organizational challenges, including, first and foremost, changes in the functioning of teams within an organization. These changes encompass changes in employee competencies. The reasons for the changes in employee competencies can be sought in the progressive technological development (e.g., emergence of new professions) (Steinerowska-Streb, Głód, 2020; Kryk, 2021; Matwiejczuk, 2021).

Due to the development of the economy, employers require university graduates to possess the ability to operate in complex work environments. Employees very often face misdiagnosed problems, incomplete and divergent information, or dynamically evolving integrated processes in such work environments. This is why properly diagnosed competencies, which involve the ability to deal with specific situations, play such an important role (Westera, 2001).

Competencies are formed through the reciprocity (Figure 1) that occurs between attitudes, knowledge and skills, while the contribution of each element largely depends on a person's interests and his/her ability to develop those. The direction in which interests are developed is determined by the educational, followed by the professional, path.

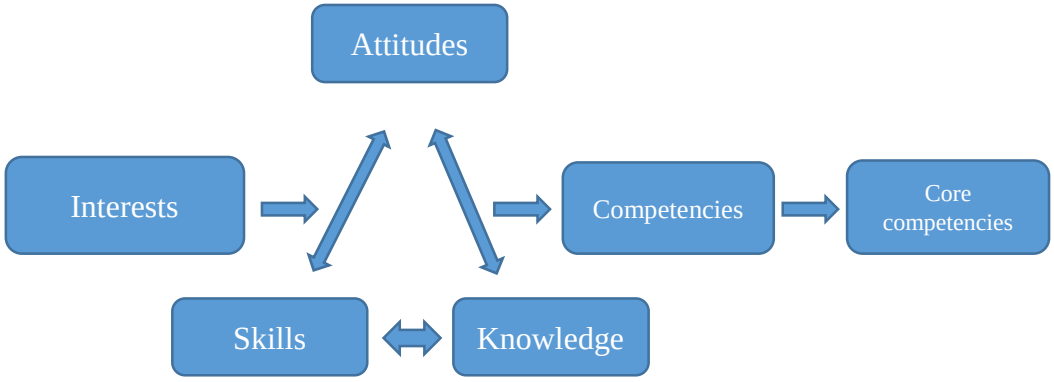

Figure 1. Competence formation. Source: own elaboration.

Source: own elaboration.

In European countries, an increase in the number of higher education students has been evident over the past few years. The increase in the number of the individuals raising their education levels indicates a general strong desire to enrich one's education, which is inherently linked with improvement of one's qualifications, level of knowledge or further development of interests (Lieberman, Remedios, 2007; Jarecki, 2008).

The manner in which the decision on whether to undertake higher education studies at all and what to major in is made affects the commitment to knowledge acquisition. According to various studies conducted by many research teams, the desire to satisfy family needs/expectations constitutes a very common motive underlying the decisions about applying to college/university (Richardson, Watt, 2005; Mudhovozi, Maree, 2012; Jarecki, 2015; Costaños, Moneva, Malbas, 2020). Another such motive pertains to financial security. Young people choose academic majors which will provide them with better job opportunities and thus with financial independence and a financially secure future(Lieberman, Remedios, 2007; Russkikh, 2019; Herz, ElAyouti, 2022). Women who plan to start a family in the future show significant differences in terms of the motives underlying their college/university application decisions. The subject literature mentions the so-called 'caregiving roles and responsibilities', which are the main factors determining young women's field-of-study decisions (Mudhovozi, Maree, 2012). One common motive fundamental in the pursuit of higher education is primarily the desire to develop one's own interests and deepen one's knowledge (Jarecki, 2015; Kember, 2016; Hudig et al., 2021).

2.2. Core competencies – definition and breakdown

Both the Polish and world literature present various attempts to expound the concept of competency, nevertheless, the term is not easy to define. Various definitions of competency have emerged in the subject literature, which often lead to inconsistent understanding of the term. The definition of competency constitutes a very important element in the terminology linking many scientific disciplines dealing with management, human resources, sociology, psychology and economics. A problem arises in the interchangeable use of the term. In the literature, the term is often linked with the concept of 'core competencies' (Prahalad, Hamel, 1990; Spanos, Prastacos, 2004; Matwiejczuk, 2021).

Currently, the concept of competency should be considered through two currents: the British and American. In the British view, competency refers to areas of work, professions or activities in which a person should be complete. This understanding of competency was developed in Scotland, during the formulation of the National Occupational Classification standards. The second view is based on the American current, initiated by McClelland and further developed by many scientists (R. Boyatzis, L. Spencer, S. Spencer). According to the American current, competencies are the human qualities enabling effective performance of professional tasks (McClelland, 1973; Boyatzis, 1982; Spencer Jr, Spencer, 1993; Bolden, Gosling, 2004; Stratton et al., 2011).

Competencies can also be viewed from two different perspectives. The first entails the individual perspective, also known as the personal perspective, involving an approach that relies on the personal skills in the performance of specific processes and tasks. The second entails a collective perspective, also known as the managerial perspective, which is pertains to the coordination of company resources and capabilities (Le Deist, Winterton, 2005; Matwiejczuk, 2022).

Various authors have made important contributions to clarifying what competencies are. An overview of the definitions of the term 'competency' is presented in Table 1.

Table 1.
Overview of the term 'competency' definitions

Author/s	Definition
Weinert F.E.	The cognitive abilities and skills available to or learnable by individuals in order to solve specific problems, including the associated motivational, volitional and social readiness, as well as the ability to use problem solutions effectively and responsibly in a variety of situations.
Borkowska S.	The behaviors determined by the knowledge, skills, motivation and attitudes differentiating employees in specific work situations.
Lehtonen T.J.	The enduring capabilities which, taking the current and future competitive conditions into account, are or can be of strategic importance in a company's pursuit of success.
Markus L.H., Cooper-Thomas H.D., Allpress K.N.	The general set of knowledge, motives, traits, self-images and (fulfilled) social roles, as well as the skills existing in a causal relationship to the extraordinary or effective performance of a specific job.

Cont. table 1.

Eriksen B., Foss N.	The unique corporate knowledge involved in the processes of effective development as well as production and marketing of appropriately defined products and services, concerning the organization and management of these processes in particular.
Kioupi, W., Voulvoulis N.	Competencies represent the integrated set of knowledge, skills, attitudes and values brought into play in different contexts (society, education, work and family) in order to deal with situations involving complex challenges.

Source: own elaboration based on: (Eriksen, Mikkelsen, 1996; Borkowska, 2001; Weinert, 2001; Lehtonen, 2005; Markus, Cooper-Thomas, Allpress, 2005; Plawgo, Ertman, 2021; Kioupi, Voulvoulis, 2022; Pacher et al., 2022).

The above-presented definitions of competency show a rather pronounced lack of consistency in individual authors' views, resulting in the aforementioned difficulty in unambiguous definition of the term. Some authors note that competencies are the character traits enabling individuals to perform certain tasks or activities. Other authors equate competencies with the resources used by companies to achieve financial or market objectives. It is also worth noting that most of the definitions of competency presented refer to the work environment and the manner in which professional objectives are achieved.

Researchers (Goddard, 1997; Savanevičienė, Stukaitė, Šilingienė, 2008; Coşgun Ögeyik, 2016) have been searching for links between the combination of competencies and the relevance thereof to (work, learning) performance (Hecht et al., 2003; Cath, 2019; Scheel, Vladova, Ullrich, 2022) since the 1960s. The literature on the subject does not unify the division typology of competencies and the factors shaping them, while the multiplicity of the criteria results from the changeability of the world (Winterton, Delamare-Le Deist, Stringfellow, 2006; Lumme-Tuomala, 2017; Cath, 2019). The generally accepted breakdown indicates the existence of the so-called soft and hard competencies. Soft competencies are those which people are born with and which they subsequently strive to perfect, whereas hard competencies are those they learn and are taught over the course of their lives (Tewari, Sharma, 2010; Lumme-Tuomala, 2017; Doyle, 2021).

Competencies entail a subject matter important enough to be highlighted in the Official Journal of the European Union, the key premises for which are listed in Table 2. They not only are universal-general, but also intersect (European Parliament and of the Council, 2006).

Table 2.
Core competencies – improvement opportunities in the learning process

Core competency	Knowledge and skills required	Attitudes
Ability to communicate in own language (native, official, etc.) as well as in foreign language	Cognitive abilities; contextualization; information searching, gathering and processing	understanding, expression, interpretation
Technical and mathematical	logical and spatial thinking, presentation of thoughts	ability to discover and infer based on premises (evidence), ability to evaluate arguments, ability to exploit technical and technological capabilities

Cont. table 2.

Computer competency	information searching, gathering and critical processing	use of interactive tools
Learning skills	motivation and a sense of self-confidence building	use of life experience, problem-solving attitude, self-management managing in time
Social and civic	the behaviors needed for active participation in social life, knowledge and application of rules of social coexistence	assurance of physical and mental health, tolerance, equality, assertiveness, commitment, respect for human rights
Initiative and entrepreneurship	Translation of intentions into action, based on creative solutions, taking risks into account	Knowledge of ethical conduct, independence, orientation towards social responsibility (collectivism, respect for phenomena of free market economy)
Awareness	respect for national heritage	cultural expression, sense of identity, openness, creativity

Each competency is used to varying degree, and there is no formula for optimization thereof. The typology of competencies is not unified, nor any uniform criteria for division have been established. F.D. Le Deist and J. Winterton (Le Deist, Winterton, 2005) classify competencies within four dimensions, i.e., cognitive, social, meta-competence, functional. M. Tyranska (Tyrańska, 2016), in turn, makes a division into general competencies (substantive professional skills, ethical approach, use of IT tools), leadership (teamwork, subordinate motivation, communication skills, negotiation skills), business competencies (analytical and strategic thinking, implementation of changes, project management, innovation). Competencies aimed at communicating through well-learned languages (native and foreign), on the other hand, facilitate the understanding of reality and reduce communication barriers in multilingual economies. Language competencies allow communities to actively participate in the life of many countries, which translates into teamwork and creative thinking. The use of languages demonstrates professionalism as well as proper team management ability (Lehmann, 2007; Hermanto, 2008).

Development of mathematical and technical competencies is essential in every area of life - from product/service creation to consumption process, from the level of a child to old age. The ability to use numbers, manifests itself in planning, constructing, accounting, etc. Technology supports the learning opportunities in the areas of humanities and/or sciences (Myburgh, Tammaro, 2013; Lee, 2016). Possession of these competencies determines innovation (creative creation), through logical thinking and analytical abilities, for these are used to learn about the relationships and phenomena occurring in the world (European Commission, 2018).

IT competencies, especially manner in which they are used for work or studying (the level of the usefulness thereof was made evident during the pandemic and lockdown), primarily entail the knowledge of computer applications (MS World, Excel, PowerPoint), Internet applications, knowledge of the information collection, storage and management regulations as well as the use of appropriate safeguards to ensure the safety thereof (Cath, 2019; Tumbas et al., 2019). Such competencies are particularly useful when teamwork, analytical thinking, goal

achievement, self-management in time and adherence to ethical standards are required (European Commission, 2018).

Learning competency is some of the most important abilities, as it is present in everyone's life from the moment of birth until the moment of death. It is this competency which we owe the ability to expand our mental horizons, build societies, but also to skillfully manage ourselves in time or solve problems to. This competency allows the formation of the other competencies (POPA and BUCUR, 2017; European Commission, 2018; Cath, 2019).

The socio-civic competencies are developed through the study of democracy, human rights, the history of tradition, world history, but also through human evolution. Owing to this process, critical thinking, decision-making abilities, teamwork, communication, persuasive valences, responsibility for oneself and others, and resistance to stress are developed (Haste, Bermudez, Carretero, 2017).

The initiative and entrepreneurship competencies are undoubtedly rooted in and developed through education at every level (Mets et al., 2022). Entrepreneurial competency is essential for free-market economy development and is in great part associated with the desire to develop/educate the society. Its significance lies in the fact that the 'level' of entrepreneurship and the actions taken by individuals determine the societies' development as well as enable the nations' enrichment. Such formation of competencies is to a large extent linked with awareness, and self-awareness more precisely, which allows development at different levels of society (Morin, 2011; Pāvels, 2014). Awareness is formed through attitudes of openness, creativity, but also through the shaping and promotion of the culture, region or country (European Commission, 2018).

2.3. Occupational preferences – the key element in the career path

Occupational preferences, including the attempts to define such predilections, currently constitute a popular subject of interest in both Polish and world literature. This is consequent to the rapidly developing economy and the socio-cultural changes, which have had a significant impact on the labor market. The young people's decisions to undertake higher education studies is often associated with the satisfaction of their high aspirations. As a result, insufficient growth in highly skilled jobs is observed. Ultimately, the young graduates often face problems with finding a suitable, but also developmental or satisfactory, jobs guaranteeing decent pay and further professional development (Jończy, Rokita-Poskart, 2014; Ochnik, Stala, Rosmus, 2018).

Every pupil, student or employee possesses certain abilities, skills or developmental potential. Each of these traits will be favorable to various specific occupational groups. It is therefore important to identify the potential dormant in young people at an early stage of their development and guide them appropriately, so those skills, abilities or the future professional potential develop accordingly. The preferences, abilities and vocational interests constitute an important component of human personality. The preferences are basic in nature

and determinant of one's professional orientation. Identification of given preferences is individual character. Due to the use of individual abilities in the functioning on the labor market, however, this individual nature of preferences is also of economic significance. The compatibility of work with preferences therefore constitutes an important element of functioning on the labor market. It primarily increases employee motivation as well as facilitates the overcoming of the difficulties emergent during the performance of a particular job. The fact that work accordant with one's preferences is more effective and results in greater satisfaction is an important aspect to be kept in mind (Bajcar et al., 2006; Mitrovic Veljkovic et al., 2019; Arbab et al., 2022; Lecy, Osteen, 2022).

Occupational preferences are currently one of the key elements influencing career path and professional development choices. Veljkovic (Mitrovic Veljkovic et al., 2019) et al. and Yan et al. (Yan et al., 2018) pinpoint that young people's decisions are subject to the influence of their parents and the people the closest to them acting as role models. The concept presented by A. Roe also emphasizes family relations as one of the determinants of both personality development and career path choices (Peplińska, Połomski, Pogorzelska, 2014).

Young people's career path choices should be fitted on the basis of personality type, taking internal and external factors into account. This choice should stem from such factors as the young person's knowledge, skills or career preferences. Nowadays, as Kalyani et al (Kalyani, Chathuranga, 2021) indicate, young people's choices are influenced not only by the above indicated parent-student relationship but by siblings, peers, mentors or teachers as well.

3. The method used

The process of research objective implementation was divided into two stages. The first involved an analysis of secondary sources, including a review of domestic and foreign literature on the subject. The second entailed a survey developed using a free-of-charge online questionnaire tool, which included:

1. 133 questions regarding career interest preferences.
2. 21 questions regarding competencies.
3. 11 questions regarding the studies pursued - the academic major as well as the manner of major and profession selection.
4. A metric consisting of 4 questions.

The research sample selection was divided into steps. First, the research population was defined. The subjects of the research were full-time and part-time students of first- and second-degree programs. The channels by which the questionnaire was to be made available were defined as well.

The next step was to determine the spatial scope of the survey and the time frame of its implementation. The survey was conducted between February and April 2022. Prior to completing the survey, the participants were informed about taking part in a research the results of which would be presented in an article. All the survey participants agreed to the taking part in the study and to the publishing of the results obtained. The survey ensured full anonymity, meaning that neither the researchers, the subjects, nor the recipients of the survey are able to link the answers provided to specific respondents taking part in the study (Babbie, 2009). Participation in the study was voluntary.

The survey covered a group of 389 full-time and part-time students. The academic majors represented by less than 10 respondents were eliminated, which ultimately yielded 371 survey questionnaires subject to the analysis. The exact number of the survey respondents is given in Table 3.

The age of the participants ranged from 19 to 52 y/o, with 84.37% of the study sample falling within the range of 19-24 years of age (Table 3).

Table 3.
Number of survey participants in distribution by age range

Age range	Number of survey participants by age range	Total %
19-24	313	84.37
25-30	28	7.55
31-35	11	2.96
36-40	7	1.89
41-45	5	1.35
46-52	7	1.89
Total	371	100.00

Source: Own elaboration based on the data collected in an authorial study.

The study sample covered 254 females (68.46%), 116 males (31.27%) and 1 person of non-binary gender (0.27%).

Table 4.
Number of survey participants in distribution by the academic major pursued

Study major	Number of survey participants	Total %
Management	74	19.95
Management and production engineering	23	6.20
Finance and Accounting	155	41.78
Business Design	38	10.24
Economics/Managerial economics	40	10.78
Information Technology in Business	23	6.20
Tourism	18	4.85
Total	371	100.00

Source: Own elaboration based on the data collected in an authorial study.

The most numerous survey participant group, i.e., 41.78% of the total number of the respondents, were students of Finance and Accounting, whereas the least numerous group were the students of Tourism - 4.85% of the total number of the respondents (Table 4).

The career interest preferences were examined using the Multidimensional Preference Questionnaire (MPQ) developed by Matczak et al. The questionnaire enables diagnosis of the interest preferences regarding the types of job activities and work conditions. It allows generation of a list of preferred and advised-against professions. The questionnaire consists of 133 questions addressing nine groups of interests and types of activities performed: Linguistic Interests; Mathematical and Logical Interests; Practical-Technical Interests; Practical-Aesthetic Interests; Care and Service Interests; Managerial-Organizational Interests; and Biology Interests; as well as the respondent's preferred working conditions: planning and improvising, strong/weak stimulation (Matczak et al., 2015).

With regard to preferences, the respondents were asked to provide answers on a 5-point Likert scale containing the following options:

- strongly disagree,
- disagree,
- difficult to say,
- rather agree,
- strongly agree.

The questions regarding competencies involved answers on a 5-degree Likert scale containing the following options:

- very low,
- low,
- average,
- high,
- very high.

4. Results, discussion and conclusion

4.1. Results and discussion

Seeking an answer to the first research question, i.e., “is the selection of academic major made taking the major-selecting person’s preferences and interests into account?”, an analysis of the differences with respect to academic major selection was carried out taking the results on the interest scale into account. The results are presented in Table 4. As indicated by Arbab A.H. et al. (Arbab et al., 2022), academic major selection in accordance with one’s preferences and interests raises young people's awareness with regard to the future career planning, can facilitate effective achievement of their goals, and influences their career decisions, which are crucial to their propensity to excel in the areas of their interest and will be utilized in their future professional lives.

Table 5.
Differences in academinc major selection, taking the interest scale scores (df = 12; N = 371) into account

Scale	Pearson's chi-squared		chi-square test	
	Chi-2	p value	Chi-2	p value
linguistic interests	13.21	0.3541	13.86	0.3098
mathematical and logical interests	36.13	0.0003	34.09	0.0007
practical-technical interests	22.76	0.0298	22.00	0.0376
practical-aesthetic interests	29.16	0.0037	31.25	0.0018
caregiving and service interests	30.12	0.0027	30.90	0.0020
managerial-organizational interests	20.02	0.0668	22.19	0.0355
Biology interests	24.03	0.0201	25.30	0.0135
Planning and improvising interests	14.41	0.2754	15.96	0.1930
Strong/weak stimulation	18.31	0.1065	21.77	0.0402

Source: Own elaboration based on the data collected in an authorial study.

Statistically significant differences in academic major selection, taking the level of interest into account, were noted for the following scales (Table 5):

- mathematical and logical interests,
- practical-technical interests,
- practical-aesthetic interests,
- caregiving and service interests,
- biology interests.

Table 6.
Academic major selection, taking the level of interest (N = 371) into account

Academic major selected	Low		Average		High		Total in # of persons
	in # of persons	in %	in # of persons	in %	in # of persons	in %	
Mathematical and logical interest scale							
Management	24	32.43	26	35.14	24	32.43	74
Management and Production Engineering	2	8.70	13	56.52	8	34.78	23
Finance and Accounting	14	9.03	51	32.90	90	58.06	155
Business Design	7	18.42	19	50.0	12	31.58	38
Economics/ Managerial economics	4	10.00	17	42.50	19	47.50	40
Information Technology in Business	4	17.39	11	47.83	8	34.78	23
Tourism	4	22.22	7	38.89	7	38.89	18
Practical-technical interest scale							
Management	22	29.73	36	48.65	16	21.62	74
Management and Production Engineering	4	17.3	9	39.13	10	43.48	23
Finance and Accounting	38	24.52	84	54.19	33	21.29	155
Business Design	10	26.32	17	44.74	11	28.95	38
Economics/ Managerial economics	13	32.50	22	55.00	5	12.50	40
Information Technology in Business	2	8.70	9	39.13	12	52.1	23
Tourism	7	38.89	6	33.33	5	27.7	18

Cont. table 6.

Practical-aesthetic interest scale							
Management	27	36.49	24	32.43	23	31.08	74
Management and Production Engineering	12	52.17	5	21.74	6	26.09	23
Finance and Accounting	45	29.03	65	41.94	45	29.03	155
Business Design	5	13.16	14	36.84	19	50.00	38
Economics/ Managerial economics	10	25.00	17	42.50	13	32.50	40
Information Technology in Business	14	60.8	8	34.7	1	4.35	23
Tourism	8	44.44	5	27.78	5	27.78	18
Caregiving and service interest scale							
Management	24	32.43	43	58.11	7	9.46	74
Management and Production Engineering	6	26.09	12	52.17	5	21.74	23
Finance and Accounting	43	27.74	77	49.68	35	22.58	155
Business Design	21	55.26	12	31.58	5	13.16	38
Economics/ Managerial economics	6	15.00	24	60.00	10	25.00	40
Information Technology in Business	13	56.52	9	39.13	1	4.3	23
Tourism	7	38.89	9	50.00	2	11.11	18
Biology interest scale							
Management	19	25.68	32	43.24	23	31.08	74
Management and Production Engineering	1	4.35	14	60.87	8	34.78	23
Finance and Accounting	55	35.48	70	45.16	30	19.35	155
Business Design	8	21.05	24	63.16	6	15.79	38
Economics/ Managerial economics	8	20.00	20	50.00	12	30.00	40
Information Technology in Business	7	30.43	13	56.52	3	13.04	23
Tourism	5	27.78	9	50.00	4	22.22	18

Source: Own elaboration based on the data collected in an authorial study.

High levels of mathematical and logical interests were exhibited by students of Economics and Managerial Economics as well as Finance and Accounting. Among the students of Economics, 47.50% indicated a high and 42.50% an average level of such interests. Among the Finance and Accounting students, a high level was indicated by 58.06% and an average level by 32.90%. In the case of the remaining majors, high levels were indicated by between 31.57% and 38.89% of the students majoring in a field of interest (Table 6).

Among the respondents distinguished by practical-technical interests, the highest percentage, taking the academic major into account, was recorded for the Information Technology in Business major, where 52.17% of the respondents majoring in this field and 43.48% of the Management and Production Engineering students indicated a high level of the respective interests. The surveyed students of other majors mostly indicated an average level of practical-technical interests (Table 6).

With regard to practical-aesthetic interests, the highest percentage of high-level indications was noted among the students of Business Design. It accounted for 50% of the total number of the students majoring in this field. A low level of such interests was indicated by 5 students,

which accounted for 13.16%. The Information Technology in Business as well as Management and Production Engineering students most commonly indicated a low level of practical-aesthetic interests. In the case of the Information Technology in Business students, 60.87% of the total number of these students indicated a low level of such interest (Table 6).

With regard to care and service interests, none of the majors surveyed showed high levels as the highest percentage. In the case of the Tourism, Economics and Managerial Economics, Finance and Accounting, and Management majors, the highest percentage of students, in the total numerosity of the students majoring in each respective field, was characterized by an average level of care service interests (Table 6).

The managerial-organizational interests were most commonly indicated at an average level by the survey respondents pursuing the academic majors analyzed. With regard to biology interests, a low level was most often indicated by the students of such majors as Information Technology in Business, Finance and Accounting, Management and Production Engineering. Students of the remaining majors mostly indicated an average level of such interests (Table 6). As Peplinska A. et al. (Peplińska, Połomski, Pogorzelska, 2014) pointed out in their study, interests include not only the interest in social influence on other people as well as in supervision and support, but also cover the interests in work on data, design, and work organization, without taking interpersonal contact into account. This has application in managerial and organizational activity as well as in various areas of managerial competency. Subsequent to that, the incidence of differences in academic major reselection was analyzed taking the results on the scale of the surveyed respondents' interests into account.

Table 7.
Differences in academic major reselection, taking the respondents' interest scale results (df = 2; N = 371) into account

Scale	Pearson's chi-squared		chi-square test	
	Chi-2	p value	Chi-2	p value
linguistic interests	0.23	0.8896	0.23	0.8892
mathematical and logical interests	8.52	0.0141	7.64	0.0220
practical-technical interests	0.49	0.7815	0.50	0.7787
practical-aesthetic interests	0.50	0.7790	0.49	0.7809
caregiving and service interests	2.13	0.3446	2.36	0.3078
managerial-organizational interests	1.35	0.5086	1.32	0.5168
biology interests	0.84	0.6567	0.85	0.6534
planning and improvising interests	2.18	0.3368	2.09	0.3523
strong/weak stimulation	3.64	0.1619	4.06	0.1312

Source: Own elaboration based on the data collected in an authorial study.

The results obtained show statistically significant differences with regard to academic major reselection, taking the scale of mathematics and logic interests into account. Statistically significant differences were not shown for the remaining interest scales (Table 7).

Table 8.
Academic major reselection, taking the interest scale results (N = 371) into account

Scale	Study major reselection	Low		Average		High	
		in # of persons	in %	in # of persons	in %	in # of persons	Total in # of persons
linguistic interests	the same	97	85.84	169	84.08	49	85.96
	other	16	14.16	32	15.92	8	14.04
linguistic interests	the same	43	72.88	128	88.89	144	85.71
	other	16	27.12	16	11.11	24	14.29
practical-technical interests	the same	80	83.33	155	84.70	80	86.96
	other	16	16.67	28	15.30	12	13.04
practical-aesthetic interests	the same	103	85.12	119	86.23	93	83.04
	other	18	14.88	19	13.77	19	16.96
caregiving and service interests	the same	100	83.33	156	83.87	59	90.77
	other	20	16.67	30	16.13	6	9.23
managerial-organizational interests	the same	84	81.55	158	85.71	75	87.21
	other	19	18.45	26	14.29	11	12.79
Biology interests	the same	133	86.93	130	83.33	52	83.87
	other	20	13.07	26	16.67	10	16.13
planning and improvising interests	the same	73	80.22	141	87.04	101	85.59
	other	18	19.78	21	12.96	17	14.41
strong/weak stimulation	the same	111	81.62	154	85.08	50	92.59
	other	25	18.38	27	14.92	4	7.41

Source: Own elaboration based on the data collected in an authorial study.

With regard to the mathematical and logical interest scale, 72.88% of the respondents in the group showing low levels of these interests would opt for the same major upon a possible academic major reselection, while 27.12% would select a different major. Considering the remaining scales including low, average and high levels, more than 80% of the respondents would opt for academic major reselection (Table 8).

Table 9.
Differences in the manner of academic major decision making vs. academic major reselection (df = 3; N = 371)

	Chi-2	Diff.	p value
Pearson's Chi-squared test	20.07	df = 3	0.0002
Maximum Likelihood Chi-square test	17.59	df = 3	0.0005

The results of the Maximum Likelihood Chi-square ($p = 0.00053$) and the Pearson's Chi-squared ($p = 0.00016$) tests, at the adopted level of significance ($\alpha = 0.05$), indicate rejection of the null hypothesis under verification. This means that, taking the manner of study major decision making into account, statistically significant differences in the academic major choices declared occur in the case of possible academic major reselection.

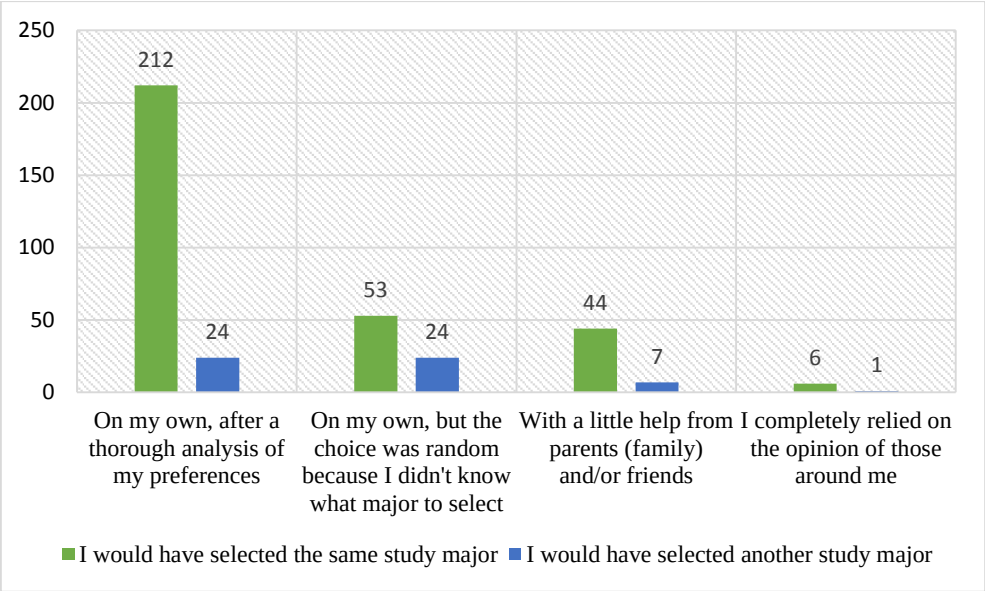

Figure 2. The manner of academic major selection, taking major reselection into account (N = 371).

Source: Own elaboration based on the data collected in an authorial study.

Taking the manner of academic major selection into account, the same major would be selected again by:

- 89.83% of those who had decided independently, after careful analysis of one's preferences,
- 68.83% of those who had made the choice on their own, but the selection was random,
- 86.27 % of those who had made the choice with a marginal help from parents and/or friends,
- 85.71% of those who had fully relied on the opinion of those around them.

Table 10.

Differences in assessment of one's competencies vs. academic major reselection (df = 4; N = 371)

Competency	Pearson's Chi-squared	p value	Max. Lik. Chi-square test	p value
Result orientation	6.31	0.1774	8.12	0.0872
Success orientation	1.43	0.8383	1.89	0.7564
Ability to implement innovations	1.31	0.8594	1.13	0.8896
Autonomy	4.35	0.3616	4.53	0.3385
Initiative	12.4	0.0146	8.78	0.0669
Analytical skills	6.36	0.1741	4.5	0.342
Self-management in time	13.97	0.0074	11.08	0.0257
Logical thinking	1.82	0.7685	2.37	0.6672
Resistance to stress	4.10	0.3930	3.94	0.4148
Ability to communicate	3.39	0.4946	3.08	0.5451
Communicative skills	6.36	0.1736	5.75	0.2186
Cooperative attitude	3.44	0.4864	2.86	0.5823
Ethics	4.49	0.3435	3.53	0.4739
Conflict resolution	4.04	0.4006	3.33	0.5046
Persuasive skills	5.02	0.2854	4.46	0.3472

Cont. table 10.

Team leading ability	5.80	0.2148	5.96	0.2025
Leadership	3.28	0.5127	3.4	0.4937
Strategic thinking	1.07	0.8988	1.24	0.8719
Shaping one's own development path	7.97	0.0925	5.85	0.2106
Planning skills	0.82	0.9353	0.95	0.9169
Motivating	2.32	0.6763	2.82	0.5883

Source: Own elaboration based on the data collected in an authorial study.

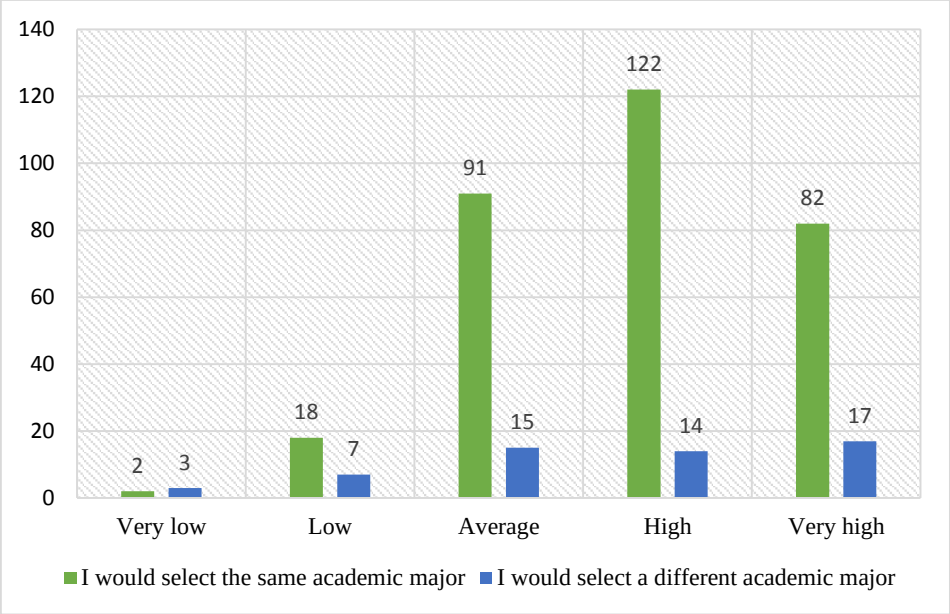

Figure 3. Academic major reselection vs. assessment of own 'self-management in time' competency (N = 371).

Source: Own elaboration based on the data collected in an authorial study.

Among those who rated self-management in time at low and very low levels, 66.67% would select the same major if given an opportunity to choose the study major again, while 33.33% would make a different choice. Among those who rated their self-management in time competency at an average level, 85.85% would not change their major if given an opportunity to select the study major again. Similarly, those who rated this competency at a high or very high level 86.70% would choose to keep the same study path (Figure 3).

4.2. Conclusions

Analyzing the results obtained, it can be concluded that academic major selection is made with consideration of the selecting person's preferences and interests. Statistically significant differences in major selection were noted with regard to the level of interest for the following scales:

- mathematical and logical interests,
- practical-technical interests,
- practical-aesthetic interests,
- care and service interests,
- biology interests.

High scale levels for at least 40% of the students pursuing individual academic majors were also shown for the following:

- the scale of mathematical and logical interest for the Finance and Accounting as well as Economics/Managerial Economics majors,
- the scale of practical-technical interests for the Management and Production Engineering as well as Information Technology in Business majors,
- the scale of practical-aesthetic interests for the Business Design major.

Table 11 shows a list of the academic majors for which at least 40% of the students declared interests in a given particular field, with indication of selected professions which are recommended for those with interests in those areas, as per the Multidimensional Preference Questionnaire (Matczak et al., 2015).

Table 11.
List of the profession consistent with academic major pursued and the interests displayed

Scale	**Academic major rated highly by over 40% of the students surveyed**	**Exemplary professions included in the Multidimensional Preference Questionnaire**
Mathematical and logical interests	Finance and Accounting Economics/Managerial Economics	Insurance agent Financial analyst Market analyst Auditor Banker Economist Tax advisor Accountant Cashier Clerk
Practical-technical interests	Management and Production Engineering Information Technology in Business	Network administrator Automator Computer graphic designer Process Engineer Industrial and Manufacturing engineer Environmental engineer Test and measurement equipment controller Draughtsman/Detailer Polygraphy technician Interior designer
Aesthetic-practical interests	Business Design	Industrial designer

Source: Own elaboration based on the data collected in an authorial study and the MPQ (Matczak et al., 2015).

The professions recommended in the Multidimensional Preference Questionnaire correspond with the professions for the performance of which the academic major pursued is intended. This possibly indicates conscious selection of a field of study enabling development of preferred interests.

The path for one's career development can be delineated autonomously or with the help of third parties. The results obtained in the study allow a conclusion that the least satisfactory academic major choices are made by those who decide independently, nevertheless, this choice is random. With regard to those who make such decisions autonomously, after a thorough

analysis of their preferences, or with consideration of the opinion expressed by those around them, including parents, more than 85% would maintain the same path of development if given a chance to select the academic major again. This suggests that interest preferences are not taken into account in random major selection only, which can result from either the lack of prior analysis of preferences or from broad interests or, quite the contrary, the lack of interests (Bielas, Czerw, 2022).

The results regarding the 'self-management in time' competency show that the higher the surveyed person's rating, in terms of the possession of this competence, the lower the probability of different academic major selection if given a chance to make the decision again. With regard to the remaining competencies under examination, statistically significant differences were not found.

One of the important elements in young people's education is career counseling. It is the appropriate diagnoses of individual mental and cognitive abilities, preferences or interests which one's further career development depends on. This is what career counseling is, inter alia, intended to serve (Arthur, McMahon, 2005). As Robert C. Chope (Chope, 2011) pinpoints in his study, career counseling primarily motivates individuals to find the right job and the right path in life. This goal is achieved by helping people understand their own abilities and preferences more comprehensively, as well as by assisting them in gaining a deeper insight on themselves, their future adaptation to the work environment and to their choice of the right profession or career path (Lo, 2019; Ulrich, Helker, Losekamm, 2021).

Research on the differences characterizing the future career choices, including investigation of the factors influencing those choices, is a topic which still needs to be developed. As Chi-Hung Lo (Lo, 2019) pointed out in his study, such research should involve an optimal approach to the counselling and guidance of young people in the right career decision making.

The relationship between career preferences, choice of study, and sustainable development is complex and multifaceted. Both career preferences and choice of study can have an impact on sustainable development. This is related to the importance of achieving long-term economic, social, and environmental balance. As previously mentioned, sustainable development is the practice of meeting present needs without compromising the ability to meet the needs of future generations. In the context of career preferences and competencies, sustainable development refers to the ability to consider environmental, social, and economic aspects in work to achieve positive outcomes for both people and the planet.

To achieve the goals of sustainable development, it is important for individuals in all fields and professions to acquire the necessary competencies to perform their assigned tasks effectively. Preferences are also significant here. The more aligned they are with the tasks performed, the higher the development of competencies. For example, a finance specialist may consider sustainable development issues in investment decisions, while an engineer may design sustainable infrastructure. Similarly, a healthcare worker can promote a healthy and sustainable lifestyle, and a teacher can educate students about the principles of sustainable development.

While preferences for career interests and the randomness of choosing a field of study are important factors in career development, approaches to competency development vary. Choosing multiple specializations may be appropriate for individuals with diverse interests, but it can delay the development of competencies related to a specific career. Sustainable education focuses on acquiring transferable competencies that contribute to sustainable development across multiple fields, emphasizing the importance of lifelong learning and continuous development.

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