Determinants of Students' College Major Choice: An Analysis of Comprehensive Models and Digital Transformation Implications

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ABSTRACT

This research discovers a "digital-shift" in social life within the scientific research devoted to the major choice among students who belong to Generation Z, providing a systematic literature review and outlining the future research agenda. The study describes the existing models of student major choice in order to disclose these models within "Digital – Z-students" frame, distilling the significant Generation Z attributes affecting students' decision-making processes. The study, based on the systematic literature review on the student major choice which relies on PRISMA method, provides suggestions for the conceptualization of the interrelation of the major choice determinants' influence and particular characteristics of Generation Z in the context of the digital transformation of the social life The paper examines widening of the social media communicational functions regarding the modern educational processes. The paper suggests recommendations on the prospective research avenues to provide a new discourse of the students' major choice consideration and background for further estimation of the digitalization impact on Z-students' behavioural intentions to choose a major. Finally, the study suggests an explanatory framework that is to consider the peculiarities of the modern students' major choice decision-making processes to provide the higher education sector with more comprehensive knowledge in order to match the needs of modern society.

Questa ricerca "scopre" un "digital-shift" nella vita sociale, all'interno della ricerca scientifica dedicata alla scelta principale tra gli studenti che appartengono alla Generazione Z, fornendo una revisione sistematica della letteratura e delineando il futuro programma di ricerca. Lo studio descrive i modelli esistenti di scelta principale degli studenti al fine di divulgare questi modelli all'interno del quadro generale "Digitale - Studenti Z", filtrando gli attributi significativi della Generazione Z che influenzano i processi decisionali degli studenti. Lo studio, basato sulla revisione sistematica della letteratura sulla scelta principale dello studente, che si basa sul metodo PRISMA, fornisce suggerimenti per la concettualizzazione dell'interrelazione dell'influenza delle determinanti della scelta principale e delle caratteristiche particolari della Generazione Z nel contesto della trasformazione digitale della vita sociale. L'articolo esamina l'ampliamento delle funzioni comunicative dei social media rispetto ai moderni processi educativi. Il paper suggerisce raccomandazioni sulle prospettive di ricerca per fornire un nuovo discorso sulla considerazione e sullo sfondo della scelta principale degli studenti per un'ulteriore stima dell'impatto della digitalizzazione sulle intenzioni comportamentali degli studenti Z di scegliere una specializzazione. Infine, lo studio suggerisce un quadro esplicativo che deve considerare le peculiarità dei principali processi decisionali di scelta degli studenti moderni per fornire al settore dell'istruzione superiore una conoscenza più completa al fine di soddisfare le esigenze della società moderna.

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1 – Introduction

The consideration of the decision-making process which students typically face in choosing a major as well as long-term debates on the perception of the student as a consumer of such so-called "educational service" or stakeholder within higher education institutions (Guilbault, 2018) are disclosed within significant amounts of literature since the 80s of the 20th centuries. Generally, the latest research puts focus on how students' perceived abilities and scientific interests define the major choices (Zhao & Perez-Felkner, 2022; Lockhart, 2022) align with the consideration of students' science identity in the frame of "consumer-stakeholder" dichotomy depending on the role model assigned to the students as a rational actor. However, such a category as a "students' major choice" cannot be considered in a vacuum it is predetermined by specific factors which include social norms, attitudes (complex perceived estimations which are formed in several frameworks: "student - labour market", "higher education institution (HEI) - students", "society – labour market", "HEI – labour market", "student - society"), etc.

While one of the most significant driving forces of the transformational processes in modern society remains digitalization. Almost all elements of the socio-economic systems in the world are to provide some digital changes in a wide range of social practices (Musik & Bogner, 2019; Davidekova, 2018). The dynamics of digitalization within social life define the speed and efficiency of society's response to new challenges to provide sustainable development in the context of modern economic and social development. The specific situation in the high education sector is related to the fact that since the mid-tenths of the twenty-first century students in HEI are represented by Generation Z which, in its turn, is considered a natively digitized one (Chicca & Shellenbarger, 2018, Nordlund *et al.*, 2019). This "digital" trend of social development provides changes in everyday life for all representatives of all generations, however the greater potential to determine the future development perspectives belongs to generation. Yet research on the factors involved in the decision-making process connected to the major choice procedure concerning the peculiar characteristics of Generation Z remains not systematic and is fairly limited.

The lack of research devoted to the determinants of the Z-students (students who are representatives of the Generation Z) major choice, its potential switching or even propensity the drop out in the context of the digitalized society leads to the gap in understanding of the modern needs, trends and processes in education by the higher education institutions (HEIs) which must become better acquainted with of their "markets of intangible services'' where they operate. Moreover, it reveals the "blind spots' ' in the understanding of Generation Z behaviour, which is of great importance considering that Z-students now is operating as a knowledge mediator and knowledge-spillover actors in the modern digitized socio-economic environment. Recently it was illustrated by their prompt response to the world pandemic challenge, which reveals the significantly greater propensity to adopt new digital technologies than Generation Y (Marshall, & Wolanskyj-Spinner, 2020).

Why is it of great importance to consider the Generation Z perspective exploring the determinants of the students' major choice in the frame of decision-making processes?

Nowadays, students' major choices tend to reflect the personal demands of a required lifestyle rather than being just an instrument of societal structure reproduction like it was at the end of the previous century (Bredo, 1993). Students often evaluate the peculiarities of living styles that are implied by jobs, such as flexibility, and so on. Such an approach is mainly linked exactly to the characteristics of Generation Z behaviour. Azimi *et al*. (2021) in their research found that Generation Z values stimulation, hedonism, and achievement more than Generation Y which is more likely to follow traditions and conformity. Shilova (2021) researched the behavior of the teenagers of Generation Z and found that there is high importance to succeeding in professional achievements for their social adaptation. Hence, we assume that Z-students' major choice due to the intrinsic characteristics inherent to Generation Z is rather to shape a societal structure in the digitalized world than just reproduce it. Nevertheless, the lack of conceptualization of the major choice studies from the Generation Z perspective was revealed through the systematic literature review as well as the issues devoted to the analysis of the social media influence in the context mentioned above were omitted. Therefore, by deepening our understanding of how students decide, and uncovering mechanisms of their motivations to choose we contribute to the body of knowledge on decision making of Generation Z bridging the literature gap mentioned above.

The arguments mentioned above turn the focus of the research to the reconsideration of the determinants and, consequently, the structure of the students' choice model with respect to the intrinsic characteristics of the Z-students. Such an approach allows the higher education sector to provide more comprehensive information on students' decision-making processes to meet the modern needs of society, to follow its demand in specialists in the most efficient way to provide sustainable development. Thus, in this study, we are going to investigate which predictors and factors are known till this time to influence exactly the Z-students' motivation and choice. Simultaneously, we seek to uncover the role of social media and media influencers in students' major choice processes within the structure of its determinants introducing digital context in the study.

Hence, the main purpose of the paper is to provide a systematic literature review on the major student's choice determinants with respect to the Generation Z behavioural peculiarities within the digitalization context in order to introduce Z-students' decision-making framework on major choice. Furthermore, we assume such kind of conceptualization is to contribute to the research on students' behaviour via outlining the agendas for future research to enrich the understanding of Z-students' behaviour. Thus, it allows providing universities with a more precise comprehension of "*how best to satisfy its students whilst delivering a high-quality educational experience*" (Campbell-Perry & Williamson, 2017, p. 1617) which is of great importance for the efficiency of higher education sector in the digital socio-economic system. This goal is supposed to be achieved by keeping following the steps. First, we introduce a brief literature review on the scientific background of the students' major choice exploration. Simultaneously, we seek to uncover the Generation Z characteristics from the standpoint of its impact on the decision-making process regarding the choice of major and, in such a way, to outline its potential to shape the future of the higher education sectors future. Second, to answer the question "Is it different how major choice is done now among Generation Z with respect to the digitalization processes in social life?" we provide a precise review of the literature devoted to the determinants of the students' major choice for the period of 2014-2022 (the choice of the period is connected with the fact that exactly from the middle of 10s the Generation Z has reached the age when the problem

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of choosing the major has raised). Hereby, we seek to check to which extent and in what areas "digital-shift" in social life is reflected within the scientific research of Z-students' major choice. We applied the PRISMA method to provide a systematic and more comprehensive approach to analysing the literature devoted to the issues described above to provide higher accuracy of the analysis. The study put focuses on the determinants, changes in its structure, and the role of the digitalization within student major choice model, specifically such aspects as social media, influencers, etc. Further, based on the systematic literature review on the student major choice determinants we seek to conceptualize the dependence of the determinants' influence and characteristics of the Generation Z in the frame of students' major choice. Here, we also define the "major choice" characteristics as a scientific category. Finally, we identify several perspective avenues for future research to address the modern challenges in the higher education sector.

Therefore, the study seeks to contribute to the literature on the topic mentioned above in two ways: first, by defining the underlying determinants of the students' major choice regarding the specific features of Generation Z taking into account the influence of digitalization on social life; second, introducing a conceptual framework to provide background for further estimation of the impact of the determinants on Z-students' behavioural intentions, in particular, to choose a major.

2 – Literature review

Based on the literature review, we introduce the theoretical background on students' major choice disclosure – one of the most vital issues within the research performed in the higher education sector. For instance, Beggs *et al.* (2008) highlighted that "*choosing a college major represents a major life decision - a decision that research has shown to be the most frequently identified life regret…*" (Beggs *et al.* 2008, p.381). Hence, to provide systematic consideration of the issue mentioned above in the frame of the modern stage of the social transformation processes in the study different aspects of the "students as rational decision-making" paradigm are uncovered in the time section. As well an overview of the student choice models worked out and discussed in the literature up to date is presented. On the other hand, we introduce the Z-student concept based on the Generation Z attributes specification.

2.1 – *Students as rational decision makers*

The general driver of the "student major choice" research historically was decreasing of the effectiveness of the so-called, university marketing strategy, i.e., significant shifts in the number or structure of college applications. For instance, at the turn of the 70s of the twentieth century, namely, a sharp drop in applications to HEI forced researchers to re-open a discussion of such categories as "students' preferences" and "students' choice" (Chapman, 1981). Such perspective is still prevalent up to date, as is shown by the growing tendency to consider the process of students' major choice as, although very specific, a kind of decision-making inherent for the "consumer choice" (Monroe, 1973).

The history of the "students' preferences" discovery was provided as a part of the discussion on revealed preferences within the rational choice theory application. Hence, the student's motivation discovery was grounded on the examination of the process of beliefs and attitude formation. Another stage of the "students' major choice" study evolution in conceptual

comprehension was connected with the incorporation of the social norms' effects into the consideration of the phenomenon Gambetta (1987). It is worth mentioning that such studies seek to disclose the issues mentioned above in the context of the analysis of the different social classes' representation in education. Such research perspective echoes the statements of sociological theories. For instance, according to selection theories which relied on the analysis of the "prestige hierarchy" structure of the society's jobs and occupations distribution, the explanatory framework is presented by the balance of "social background-aptitude" matters. Further development of these ideas was gained within the reproduction theories which stated that the educational system unintentionally serves the social structure reproduction (Bredo *et al.*, 1993). The mechanism of the social class influence turned out to be indirect through the ambition attributed to the starting point of a person belonging to a certain class. Subsequently, such type of the "indirect mechanism" of the influence regarding the formation of attitudes and beliefs concerning education took shape in the academic self-concept.

Another direction of the study on student major choice development arose when the concept of values was taken into consideration. While at the starting point this concept relied on the personal educational options in "cost-benefit" analysis as an explanatory framework for the social class structure of educational participation Boudon (1974), the further concept was deepened and focused on the factors of the intrinsic value of education formation. Thus, aligned with the consideration of the education value formation in terms of the social gains which result in the set of job opportunities in the labour market, scientists introduced the lens of the "family cultural capital" as an influencing factor in the formation of the student's perception of the education value (Bourdieu & Passeron, 1990). These ideas also are reflected by the psychological life pattern theories of the students' choice nature tying it up to the previous life experience, which was formed in family, i.e., historically dependent on the "family cultural capital" gained. Simultaneously, another group of psychological theories, so-called trait theories discover the academic self-concept in the aspect of the "statistical connections between individual traits (intelligence or grades in secondary school) and their choice of a course of education or job" (Bredo *et al.*,1993, p. 64). The central focus on the traits theories is inherent and widespread in the studies of the student's major choice devoted to the consideration of the single educational specializations (mainly knowledge-based, for instance, STEM). In such a way initial framework for the student's major choice analysis was formed on the ground of such categories as "values", "norms", "beliefs" and "attitudes" and dealt with the disclosure of the factors influencing these categories.

The other aspect of the study evolution related to the opening the discussion on the peers' effects in regard to issues mentioned above. Initially, the mechanism of the development of the student's expectations of their academic abilities under the external influence was connected with the assessment of the parents' and teachers' opinions importance (Entwisle & Hayduc, 1981). In subsequent studies, the concept was enriched by studying the qualitative characteristics of peers (Berthelon *et al.*, 2019). Students' perceptions of their own abilities are not developed in a social vacuum but are determined by a set of external evaluations that could vary according to different attributes (such as social status, gender, etc.). Hereby, opening the peers' effects concept more precisely, it is worth mentioning that it deals with the estimation of the degree of influence on the students' self-concept formation depending on characteristics of the peers' structure (gender, age, ethnicity, social background, level of the academic achievements, etc.) Therefore, in the evolution of the students' major choice as a study, the

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following research question was formed: "Are students' beliefs about their own academic abilities affected by their sex, social-class background, parents' educational level, and parents' and students' cultural participation?" Precise consideration of these factors' interrelation outlines the main research avenues devoted to the major choice consideration. In fact, rational theorists' achievements conceptually underlie the developed students' choice models. Moreover, in such studies assumptions of the sociological and psychological theories are considered in combination.

Moreover, the consideration of the student's major choice under the "students acting as rational decision-makers" assumption significantly depends on the role assigned to the student as an actor in the high education sector. In the literature related to the issues mentioned above students within the educational processes are considered as customers or stakeholders, disclosing behaviour patterns in correspondence with the chosen role model. HEI as providers of the complex intangible service with a long-term consumption process adopted elements of the societal marketing philosophy, combining the tasks to meet students' needs with the mission of the public-welfare orientation (Vrontis *et al.*, 2007; Ng & Forbes, 2009; Guilbault, 2018). In addition, a such conceptual framework is supported by the application of the service dominant logic, when customers are considered as service co-creators, while customer-determined benefits are defined within students' "traits-opportunities" self-estimation which forms in a complex environment (Vargo & Lusch, 2006; Finney & Finney, 2010).

The co-creators' assumptions reflect the meaning of the "engagement" category. "Engagement is critical – education is not a passive service – the student must make a commitment and contribute for the desired outcome to be achieved" (Guilbault, 2018, p. 297). Such a scientific lens results in a "students as stakeholders" concept consideration (Aguinis *et al.*, 2019), which, in its turn, is in line with the disclosure of the student's role and participation as stakeholders in quality assurance in the higher education sector in the "European Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)" (European Association for Quality Assurance in Higher Education, 2009). However, it is worth mentioning that the "stakeholder" attitude is applied in the context of the university governance, in particular, the role of the students in the decision-making processes within the strategic regulations' development and implementation of HEI's quality enhancement (Shattock, 2002; Menon, 2005; Leišytė, 2015). It means that such a lens is to be applied after the students' major choice is made and is more related to the managerial analysis and seems not to have the explanatory potential of the factors of influence on the major choice study. Nevertheless, there is another phenomenon of significant importance within the educational process - change of major or dropout. So, the question of "Whether the students' major choice is to be made once or it is prolonged in time with the permanent process of the "expectations-reality" compliance verification?" arises. Moreover, the modern research dealing with the students' transfer from one to another institution and choice major, proves the significant difference in decision-making processes between students in the different years of study, even though they operate within the external environment of a similar structure (Lukszo & Shannon, 2019).

Therefore, the student's role models cannot be ignored when studying the choice of a major. On the contrary, as far different role models imply different processes of decision-making, which implies accordingly different weights of the different factors of influence, then the clearer understanding of the student's role will be, the greater accuracy of the analysis it will provide.

Moreover, it is of great importance, while examining the influencing factors of the external environment on students' major choices to provide characteristics of the actors' interrelation within the educational system. For instance, it is necessary to understand not only the administrative staff perception of students (as internal customers or stakeholders, etc.), but also administrative staff perception of themselves (as service-providers or mentors, etc.) (Berman & Pitman, 2010).

Demonstrating the evolution of the study on students' major choice, it was revealed the lack of the systematization and conceptualization of the digital-transformation processes impact within the framework of the major choice studies. As previously stated, current research necessitates reopening the analysis of the factors that affect the major choice made by individuals after 2014 as far they belong to Generation Z which highly differs from Generation Y students. The paper highlights the necessity of the influencing factors reconsideration under the conditions of societal digitalization. Moreover, it seeks to outline the research agenda to bridge the literature gap and, in this context, to discuss the potential of a new qualitative stage of the students' choice theories development. Therefore, to perform the tasks mentioned above, further we investigate the research related to the factors of influence on the Z-students' major choice starting from 2014 up to date, putting the main focus on the social media impact, defining its place within students' major choice models.

2.2 – *Models of student choice description*

The students' major choice model is to define a set of determinants (factors that predetermine the choice: internal (student characteristics) and external (social norms, significant persons opinion, etc.) and reflect the mechanisms of its influence. In this part of the study, we describe a few examples of the most comprehensive and generalized models in order to provide further discussion on the prospects of the digital transformation impact displays.

The model suggested by Chapman (1981) consists of two main groups of factors. The first group incorporates previous experience and current individual characteristics of the student (level of educational aspiration, high school achievements), while the second group covers the influence of a set of external factors (see Figure 1). This set, in turn, includes three subgroups: first – takes into consideration both the immediate environment (family, friends, peers) and other "influential persons" (teachers, advisors, etc.); second - the HEIs features (cost of education, location, educational programs availability); and the third - the patterns of the "institution – students" communication (information accessibility, campus visiting, open doors day, etc.). The model introduces the generalized category "students' expectation of college life" which is to reflect the effects of the influencing factor of both groups and is formed on the background of such an effects consideration. Consequently, according to the model, it shapes the students' college choices. In the frame of the suggested model "students' major choice" and "students college choice" conceptually coincides.

The model highlights that the determining factor in the selection process for the college is students' individual characteristics. It is worth mentioning that the inclusion of the college choice in the model which describes students' choice is not common practice and remains uncovered as a restricting factor. However, this model does not put focus on the interrelation between students' choice and college choice, it shows these decision-making processes as parallel.

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In fact, the college choice plays a role as a filter within the students' major choice decision-making process, however model does not suggest the explanatory framework on when and how (within self-estimation or fixed college characteristics, before or after major choice) this "filter" is applied and, moreover whether it is a restriction or defining factor.
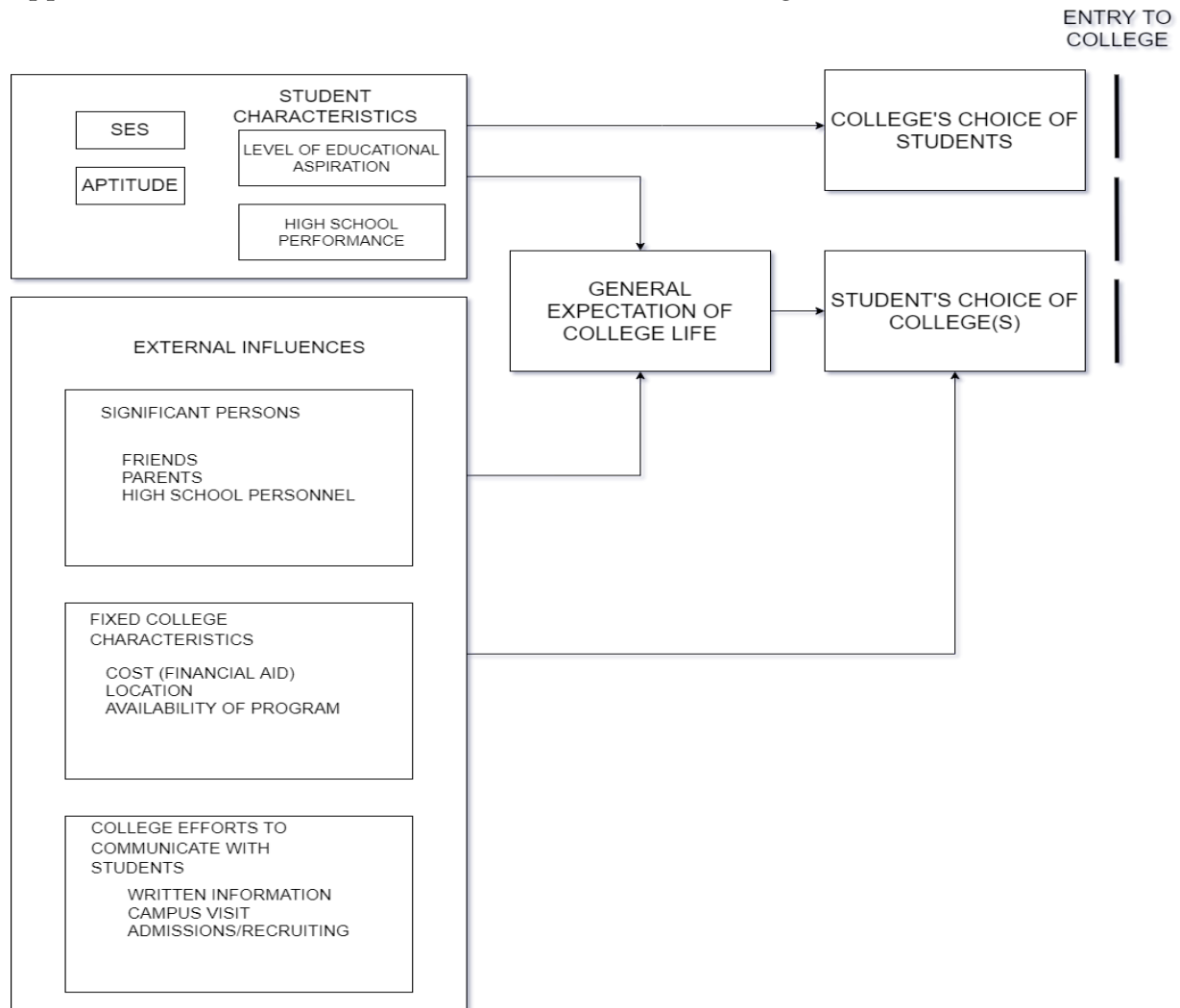

Fig. 1 – Model of Influences on Student College Choice (source: Chapman, D. W., 1981).

Further, the literature review shows that in subsequent studies college choice is typically omitted, however, this model is applied as a background for further treatment of the students' decision-making on major choice. Another feature of such decision-making processes' further consideration is a high level of specification. By specification we mean that students' major choice is mainly treated within one particular specialty, for instance, STEM, health care, criminalistics, etc. (Arcidiacono *et al*., 2016; Perera & McIlveen, 2018; Griffith & Main, 2019; Ding *et al.,* 2021; Kugler *et al.,* 2021; Yang *et al.,* 2021; Zhao & Perez-Felkner, 2022; Brown *et al.,* 2022). One of the most comprehensive examples of such model adaptation is an application of the theory of reasoned action (TRA). To illustrate it we describe a sample of the application of the TRA framework on the general conceptual students' major choice model treated within information systems specialty suggested by Zhang (2007) (see Figure 2). The spread of the TRA application is due to the strong conceptual connection between the intention to behave in a particular way and the "actual behavior" that is implied within this theory. Therefore, this

theory become an important tool for the study of a such complex phenomenon as a student's major choice, especially considering the sophistication of the actual behavior practical analysis. So, the model presented in Figure 2 operates on two conceptual groups of factors that represent different aspects of the personal attitudes towards choosing the information system major and subjective norms to provide an explanatory framework for students' intention to choose this particular major.
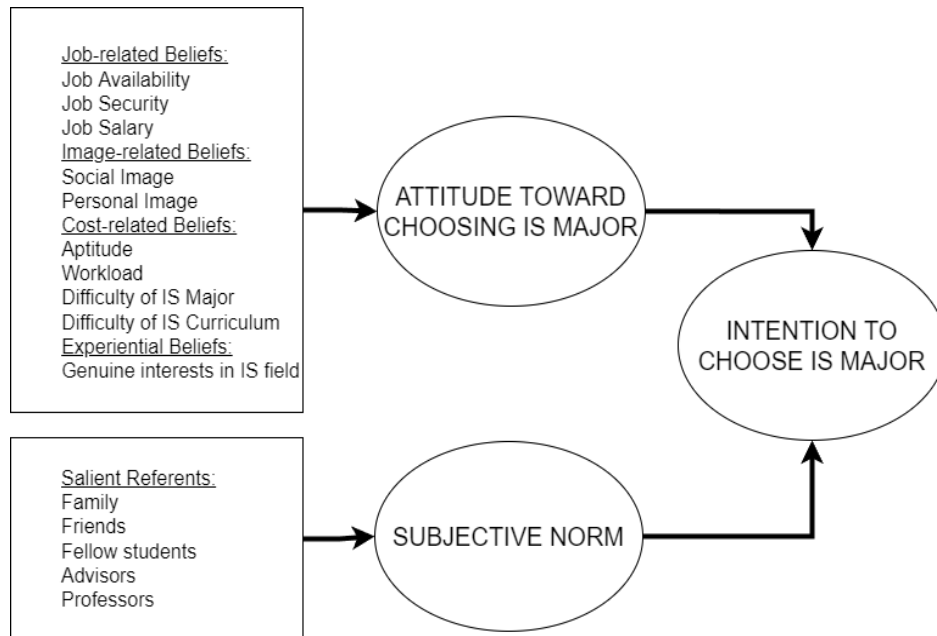

Fig. 2 – The TRA framework (source: Zhang, W., 2007).

In such a way model covering the influence of the family, peers, teachers, professors, etc. excludes from the analysis HEI characteristics as well as "HEI-student" communication influence. It concentrates directly on the students' beliefs (job-related, image-related, cost-related, and experiential) and salient reference influence. For such kind of analysis, the variable "experiential beliefs" was introduced, it was defined as "the expectation of the psychological reward that will result from performing a behavior" (Zhang, 2007, p. 449). Thereby, previously analysing the students' choice researchers considered the "study costs" factor, with this model "job-related beliefs", so in this case, within the decision-making process, the study is considered as an instrument to meet the expectations of future achievements. Moreover, such type of models has a strong explanatory and illustrative power with respect to the gender differences discovering.

Applying subjective norm determinants within the TRA framework, the study reopens a question on the significant influence of socialization patterns on the students' intention to choose the major. One of the main derivations stated that established socialization patterns inherent to the particular area or social group influence the intention to act stronger than any type of students' beliefs (even job-related) and provide barriers to translate beliefs into positive attitudes and, consequently, to the intention to choose a particular major. It is worth mentioning that typically such effects studies consider analysing STEM majors, however, at the same time in the frame of TRA, it was revealed that gender differences in the perceived difficulty of the major were insignificant. Thereby, we assume that socialization patterns' strong influence is

manifested in a much larger range of specialties and could indirectly provide inequality in job markets. However, there is still a lack of empirical evidence for the generalization.

Finally, the third type of student major choice model is highly related to the mentioned above discussion on the "students as customers" concept in the higher education sector. The most representative model in this context was suggested by Vrontis *et al*. (2007) (see Figure 3).

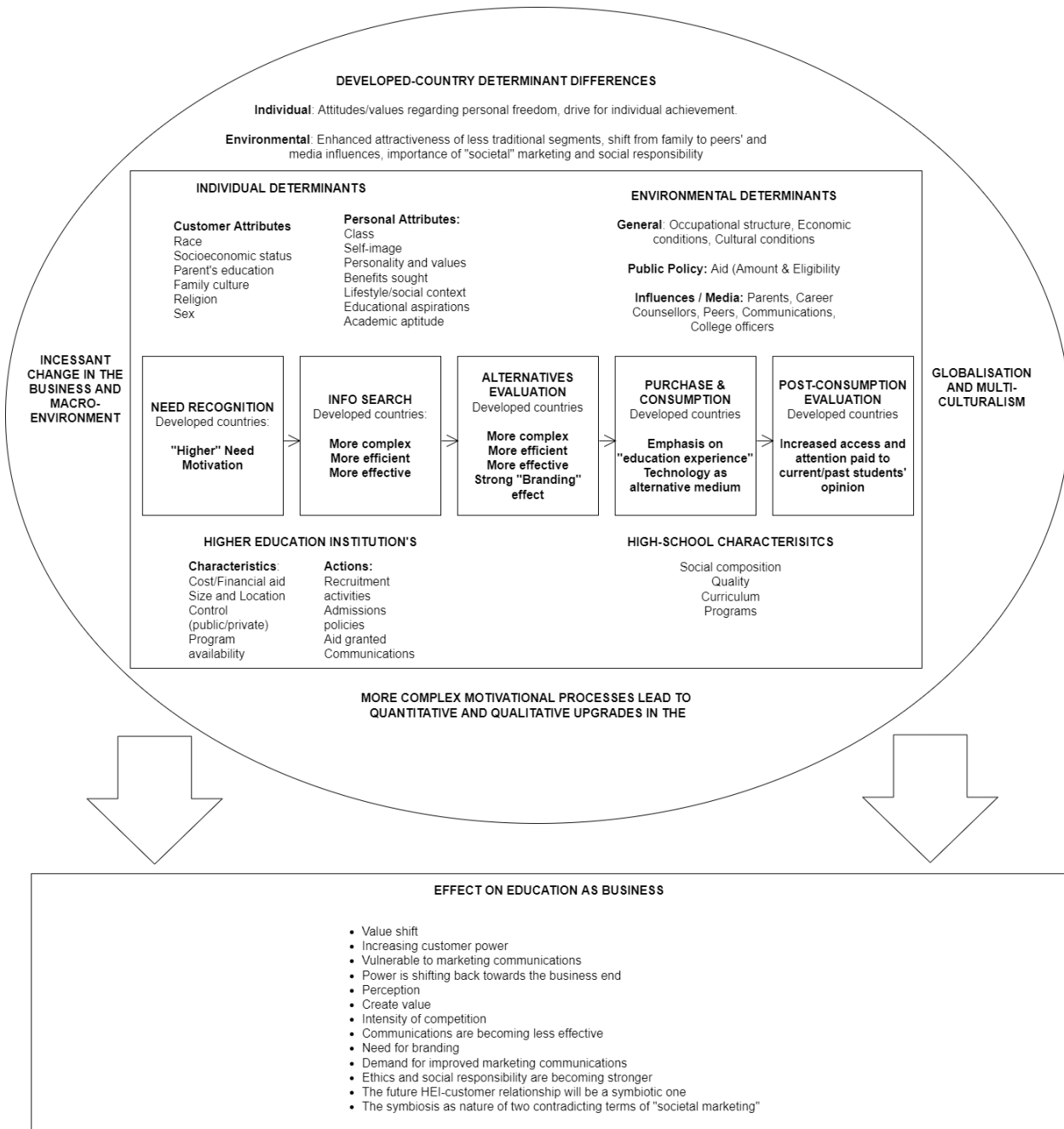**Fig. 3 – A contemporary higher education student-choice model for developed countries** (source: Vrontis *et al*. (2007)).

Despite it states the limitation of application only in the higher education sector in developed countries, we consider this model as comprehensive and illustrative for the purposes of this study. It is grounded on the adaptation of the classic consumer behavior decision model,

which in the context of higher education transforms into a 5-stage decision-making process: college aspirations (need recognition), search process (search of information), information gathering (alternatives evaluation), sending applications (consumption), enrolment and study (post-consumption evaluation). Within this model the college choice presented in the model 1981 was brought back to the contemporary model with a defined place in decision-making: college actions influence the student choice as a filter between sending applications and enrolment. According to the authors, a set of determinants form the framework in which this model operates. This set consists of three large groups of determinants:

(1) individual (where students' characteristics were considered separately as customer attributes (race, gender, socioeconomic status, etc.) and personal attributes (personality, self-image, etc.);

(2) environmental (covers different hierarchical levels from the occupational structure peculiarities to family, peers and media influences);

(3) institutional determinants (incorporates the characteristics of both the HEI and the high school background). Moreover, another feature of this model is an attempt to depict the ways of its incorporation within the common socio-economic system. Such incorporation is described as the bilateral mechanisms of the HEI interaction with the wider economic environment of the country.

The substantial feature of the model we discovered is opening the discussion on the changing of the role of the media in the students' decision-making processes "in relation to environmental determinants, there is an apparent shift from family to peers and media influences" (Vrontis *et al.*, 2007, p. 985). However, media is considered only from the lens of the communication channels development, the model conceptually does not consider such phenomenon as the digital transformation of the social life and the role of the media not only as diversification within search instrument but also as an "influencer" effect by itself. Hereby the discussion of great importance is opened, but still is not disclosed neither theoretically, nor empirically. Simultaneously, this model for the first time seeks to attract attention to the attitudes and values determinants within students' individual characteristics with respect to such categories as "personal freedom", lifestyle, and individual achievement aspiration. These personal characteristics are typically used to portray the Generation Z, consequently, we assume that change within these characteristics' comprehension may provide a strong influence on the Z-students' major choice with respect to the digitalization processes. Further, we provide a more detailed consideration of the Generation Z characteristics.

2.3 – *Generation Z. Whom we are considering as a Generation Z?*

The generations paradigm in the study is of great importance to deepen understanding of the students' behaviour and figure out if there are any changes when students are choosing a major in the academic sphere due to the generation types of differences. Are there any changes related to the generation's decision-making factors in how they choose majors? Therefore, we need to identify what we understand as a generation and whom we consider as Generation Z. Differences and similarities of groups that were born in the same period of time under common historical, political, cultural, and technological events are featured within age cohorts called as a generation. Individuals of one generation share some common characteristics and features

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because influenced by particular the same events in the region, at one time (Kupperschmidt, 2000).

Generation Z - as per the latest classification by the Pew Research Center (Dimock, 2022), individuals born in the mid- 1990s onwards become a part of a new generation called post-millennial or Generation Z. The Post-Millennials or Generation Z raised in the 2000s and generation's childhood period was tightly influenced by tremendous popularity in technology related to web, internet, smartphones, laptops, networks and digital media occurrence as social media usage of them (Dolot, 2018; Dimock, 2019). Due to these facts, this generation is named the "digital natives" generation. The chronological endpoint of this generation has not been set yet, but we need to mention the young generation's appearance as Generation Alpha from the mid-2010s as an approximate endpoint for Generation Z. Post-millennials are, moreover, commonly defined as Generation Z, Gen Tech, Digital Natives, Net Gen (Suderman, 2016) Gen Next or Gen I (Ernst & Young Report, 2016), i-generation, online gen, switchers (McCrindle, 2020), but Generation Z is the most common way of referring to this cohort.

The general peculiarity with the strongest impact on generation formation is the era of the emerging and worldwide spreading usage of the internet and smartphones. Generation Z representatives are surrounded by technologies at all stages of their social life (video games, online messengers, online stores, etc.). (Prensky, 2001). Generation Z is becoming the students, solvent customers, and economic agents with perception and lifestyle which significantly differs from previous generations ones (Buathong *et al.*, 2021). It is coherent to contribute to the research related to Generation Z behaviour consideration, in particular disclosing the peculiarities of the decision-making processes. The study is aimed to conceptualize the students (who are representatives of Generation Z) decision-making with respect to the major choice. What do Z - students think about their future from the perspective of the college/university student? How do they see themselves in the future while they are planning which major, they are going to choose?

Based on previous research we consider Generation Z as people who were born between 1995 and 2012, due to the bearing of Generation alpha in the 2010s (McCrindle & Fell, 2020; Janssen & Carradini, 2021). According to Prensky (2001), Stillman & Stillman (2017) in the book "Gen Z @ Work" there are seven identified key traits of Generation Z which are as follows:

1. Phigital - prefer technological sophistication in a company;
2. Hyper-custom - want to customize and write their own job descriptions;
3. Realistic having a pragmatic mindset (influenced by accidental historical events);
4. FOMO - fear of missing out on anything;
5. Weconomists -believers in a shared economy;
6. DIY (Do It Yourself) - fierce and independent;
7. Driven - feeling competitive with people doing the same job, and activities.

Physical things which can appear in the digitalized environment are called "phigital". According to Stillman and Stillman (2017), Generation Z representatives seek to connect the digital environment with the real world in order to have an authentic and convenient experience. In other words, it explains popular occurrences of digital environments such as online shops, online courses, delivery services, streaming, donating, payments, digital software, and applications popularity that can substitute the interaction in real life. Especially we should note that the COVID-19 pandemic made the digitalization process faster and consequently, phigitalization process became a natural phenomenon at the beginning of 2020. Related to the

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phigitalization, readiness for jobs and activities such as studying that became possible to do "without leaving a home" raised acceptance of the digitalization concept among Generation Z so it is identified as a digital one. When most of the activities became digitalized, as a result, smartphone addiction started to become one of the attributes of Generation Z and this will be discussed later in this passage.

Moreover, due to digitalization, this generation gets used to manipulate the data, the user experience, and user design, they also start to accept the concept of customization which leads to hyper-customization which is another particular attribute of this generation. Generation Z is eager to customize the job descriptions by creating new workplaces and starting to freelance, or in other words working remotely, on intellectual jobs. Therefore, majors/specialties/areas of study at HEIs are supposed to meet the needs of modern students.

Due to the digitization of everyday life, Generation Z generates more content as users than previous generations. Therefore, they are dependent on checking the statuses (Facebook, Messenger, WhatsApp, Telegram, Snapchat), stories (Instagram), emails, and other updating platforms to check the reaction of the followers, new updates on the forums, blogs, groups, and so forth. Permanent checking of new content makes Generation Z feel up to date and not missing out on anything important This particular psychological attribute is called FOMO. This phenomenon is supported by the research related to attitudes of teenagers, and students on news related to COVID-19, especially at the beginning of the pandemic (Liu *et al.*, 2021; Pérez-Escoda *et al.*, 2021). Consequently, the anxiety level and mental health of teenagers, students, and young adults are raised due to checking updated information on social media.

In continuation of the research of Stillman & Stillman (2017), Generation Z is the representative of the shared economy community. The popularity of the shared things for subscription and other payment methods is arisen in the moment of Generation Z's teenage time as carsharing, scooter sharing, kick scooter sharing, and room and house sharing (for example, Airbnb). Also, this phenomenon might be explained by the influence of sustainability ideas and ecological problems on the planet. As well idea of buying not the product, but experience and the service is popular among this generation.

Generation Z was influenced by the emerging power of the internet, and social media such as YouTube, Facebook, Instagram, and so on, thus they are integrated into the world's community life through their devices and platforms (Madden, 2018). We assume, that this generation has become more globalized than previous ones due to the openness of information from all over the world. The primary source Generation Z representatives are using for information gathering is social media (McCrindle & Fell, 2020). However, this generation is less likely to trust information if it is just on the internet, which is showing the complexity of the information evaluation from the trust standpoint (Ipsos Thinks *et al.*, 2018). Few of Generation Z's distinctive characteristics as presented by Oblinger & Oblinger (2005) are a) digitally literate i.e., techno literates explaining the technological capabilities, b) social - always connected through the social network, c) immediacy - in receiving responses and information, d) multitasking - switching back and forth.

Moreover, the change of weights of impact factors among Generation Z is to be considered as a particular generation attribute. If previously the most influential factor for the student was family, nowadays it is preferred to search for information on the internet or follow the internet influencer on social media related to an interesting topic for the individual. In addition, this effect could be represented at a multicultural level. For instance, Vietnamese Generation Z is

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influenced by Korean culture called Hallyu, social media, and social norms in this Asian society (Nguyen, 2019). The influence from a family might have been lowered because the family institution is different now due to the high divorce rates, etc.

Furthermore, as it was mentioned above, the relationship between Generation Z and their phones or the internet is researched. Recent studies show that Generation Z is addicted to use their smartphones and purchase goods in a spontaneous way as it is shown in Figure 4 (Mason *et al.*, 2022).
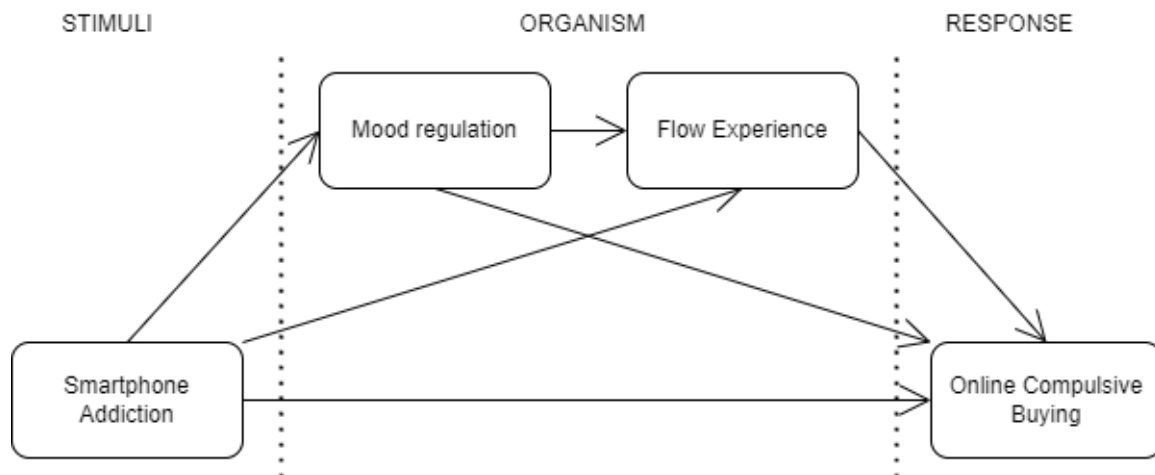

Fig. 4 – A proposed theoretical model of smartphone addiction and purchasing goods in a spontaneous way (source: Mason *et al.,* 2022).

Moreover, it is stated that the widespread phenomenon of online compulsive buying is one of the displays of the compulsivity of Generation Z decision-making. The model below demonstrates the smartphone addiction mechanism. As far it stimulates a good mood and flow experience, easy-way access to experience the feeling close to happiness or satisfaction. This model describes the mechanism of compulsory decision-making on the example of compulsory buying. It is applied when there is a trigger that motivates the organism to respond as taking the smartphone into the hands, getting into the online stores to purchase any goods or services, or feeling relief from the action of buying. Another study in China clarifies the usage of smartphones, especially the internet and social media among Generation Z as follows: (1) for socialization through communication, and instrument to reduce the fear of missing out on anything; (2) for self-expression and increasing social capital to gain attention from the public they follow or are followed by (Hu *et al.*, 2022).

It means that checking social media for new messages, new likes and comments, updates, and so on matters for Generation Z. This is a key factor that has to be implemented into the marketing of the higher education institution for building a brand and loyalty among the new generation. By learning the behavior of the students, it is necessary to disclose the way how they are attached to the digital, social, and public life of the HEIs they are entered.

Due to the tech-savviness of the generation, the media they are interacting with is still by concept similar to previous. For example, the TV sets were changed to Netflix and other subscription-based streaming services, the chat-rooms were changed to video calls, photo-video stories for 24 hours, the content became more interactive than before, life-span of attention is decreased thus the video lengths are also (for example, up to 1 minute TikTok and Instagram

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videos), but the online presence of the user is increased, podcasts instead of radio and so forth (Ipsos Thinks *et al.*, 2018). Research by Törőcsik *et al.* (2014) indicates that this generation has a shorter attention span than millennials, but greater fear of missing out than the previous generations. However, the question is, even if they are living in an era full of information, how do they decide what to choose?

A further attribute of Generation Z is its greater potential to change the established social norms, it is more progressive and diverse than previous generations, therefore it will create a new environment that is considered "safe" for their development as an individual. They feel more tolerant of feminism, LGBTQ+ society, moreover, they are gender neutral, therefore shifting the gender roles (which is influencing marketing based on gender as creating product lines that are genderless for example clothes, perfumes, etc.), traditional views (normalizing the attitude towards same-sex relationship and marriage) (Ipsos Thinks *et al.*, 2018). There is also a need to understand how strongly this influences the life choices of Generation Z and whether it is the same for each region of the world.

Generation Z's one more common shared feature is being proactive in terms of entrepreneurship and social responsibility. They are aware of social issues and environmental problems due to their tech-savviness and follow updated news instantly ("to follow the trend" as the activity related to following the news as the main concept of being proactive). Thus, many of the Generation Z representatives start their own entrepreneurship activities. According to Weise (2019), 1 of 4 Generation Z people learn how to build their own businesses, and 1 out of 10 already have their own businesses. Investigating the consumerism of this generation, it is identified that corporate social responsibility affects the process of the intention's formation of Generation Z. For instance, Egyptian Generation Z in the research of Khalil *et al.*, (2021) showed infantile, but informed and reactive behavior in the market whose actions anyway can contribute to the social corporate marketing.

Generation Z's representatives are considered open-minded individuals. Though the research proves readiness for adjusting new technologies, to change a lifestyle to completely new less discovered ways, even if they have minimal knowledge about the new issues. For instance, the result of the Yunos & Din (2019) research showed that Generation Z tends to be open to new experiences such as colonizing Mars, using AR and VR in their life, including AI in everyday life.

So, this shows us the next feature of Generation Z as people motivated by the development of the world and highly progressive. Also, they live in an increasingly multi-ethnic and multicultural world which leads to raised tolerance for diversification and openness to a new experience.

To conclude, Generation Z displays common features of individuals of this age cohort that is completely or slightly different than previous generations. This generation is accepted as digital natives (but not pioneers) and tolerant individuals for diversification of the society members' identities, as well as highly aware of the social, political, and ecological issues. Discovering these attributes information is of significant importance for understanding the behavior and decision-making processes of Generation Z, in particular major choice processes.

3 – Methodology

This research methodology utilized a systematic literature review (SLR) to investigate the topic of major choice among Generation Z students. The search strategy involved searching for

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relevant studies in the Scopus database using specific keywords and phrases. After a control screening, cross-referencing articles were included to enhance knowledge on the subject. The selection criteria were based on the PRISMA Statement (Page *et al*., 2022), which aimed to map the existing literature on major choice across various fields such as sociology, economics, business, psychology, computer, and behavioural sciences. The search period was limited from 2014 to 2022 since it is estimated that Generation Z began attending universities in 2014. All articles before 2014 were excluded, except those found through referencing citations. The search did not focus on territorial exclusion or inclusion.

The study included scientific research articles, review papers, and conference papers. To ensure the quality of the review, all duplicate records were removed, and the data was cleaned of repeated information. The abstracts of the papers were thoroughly analysed to ensure the quality and relevance of academic literature included in the review process.

Later, a precise consideration of each research paper was carried out, and the next exclusion criterion was to limit the papers published only in the English language. After the filtration, 401 records were deleted, and a total of 65 abstracts were extracted at this stage.

The PRISMA Statement is a widely accepted guideline for conducting systematic literature reviews. It emphasizes the need for a transparent and reproducible search strategy, clear inclusion and exclusion criteria, and a rigorous process for selecting and analysing relevant literature.

By adhering to these guidelines, this study ensured that the selection of literature was unbiased and comprehensive, which enhances the quality and reliability of the research findings.

Overall, the SLR methodology used in this research aimed to provide a rigorous and comprehensive investigation of the topic of major choice among Generation Z students. The PRISMA Statement was utilized to ensure that the selection and analysis of relevant literature were systematic, transparent, and reproducible.

The study's findings can be considered reliable and valid, as the methodology ensured the inclusion of high-quality academic literature and the exclusion of irrelevant or biased records (see Figure 5).

Therefore, in the data extraction phase, 65 articles after assessing each paper on the aforementioned inclusion and exclusion criteria, were selected and the characteristics were:

1.   Article must be original paper, review paper, conference paper and conference proceedings.

2.   The article must be in English from the field of social sciences, business and economics, psychology, computer sciences and decision sciences.

3.   Extracted articles were published between 2014 to 2022.

4.   The papers must have open access for reading and analyzing the content of each research.

In the process of abstract screening, we found that 25 of the articles lost open access. While reading full texts 4 of them were related to other fields irrelevant to this study and 3 of them were about changing the major rather than choosing a major. Therefore, we had 53 records at the final stage.
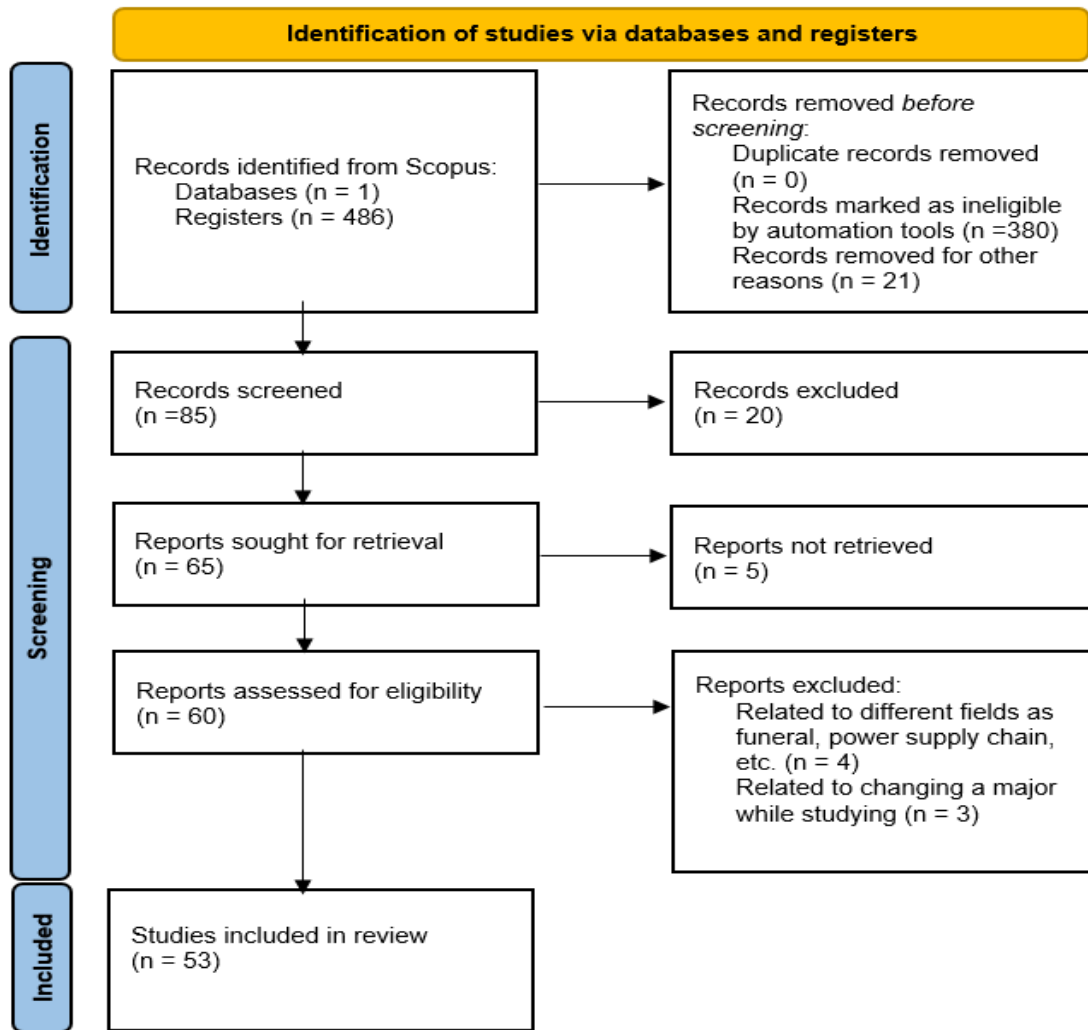
Fig. 5 – The PRISMA Framework
(Preferred Reporting Items for Systematic Reviews and Meta-Analysis)

Figure 6, in turns, demonstrates to the number of papers publicized from 2014 till 2022, which relates to the years of graduating from high school of Generation Z with following by the entering universities. In 2014 the interest in the topic with the keyword "major choice" was very low. From 2015 to 2018 the interest was stable at 6 articles per year. However, starting from 2020 the interest was raised, therefore 8 articles were published in that year.

In 2021 the publications exceeded 18 and showed the highest results by several papers published on Scopus database journal/conference. Also, we should mention that at the moment of writing this article it is 2022nd year, therefore the graph for 2022 might be different at the end of the year, but at the beginning of 2022, there are already 9 articles published.

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Relatively high interest in this topic of major choice might arise in the 2020s in a relation to the pandemic, new generation's features which are highly associated with digitalization which was discussed in the previous chapter, and the pandemic plays the role as a driver of the transformation processes.
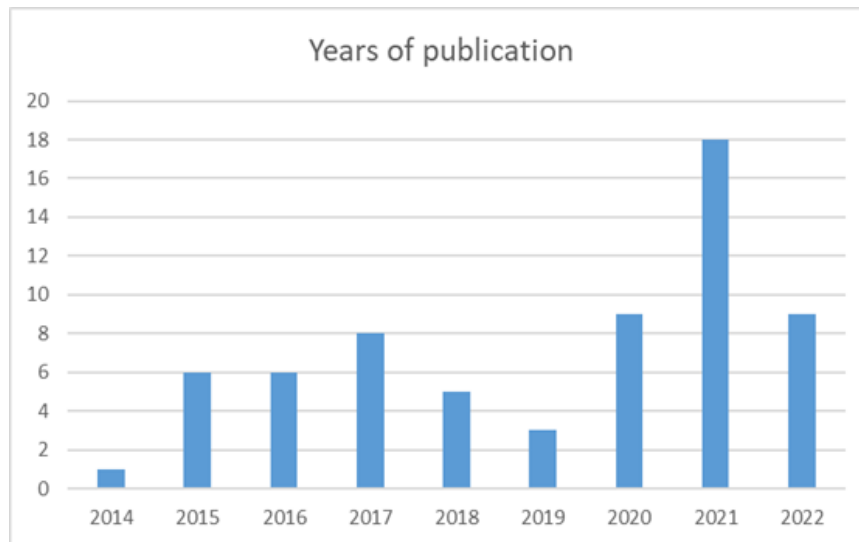
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Fig. 6 – Number of papers on major choice by year of publication in 2014 - 2022.

According to the information extracted from the Scopus database, it is conducted a consolidated analysis of citations as it is shown in Figure 7. In this analysis, we identified key journals that were popular for the core papers' citations. The data analysis shows that the most popular sources where the papers were cited were related to economics.

Consequently, the second most popular source of papers was related to educational research. Then the areas related to human resources, STEM, and psychology were represented by papers in descending order. In our opinion, this shows that the major choice of the students has an important role in understanding the students' decision-making processes which are related to the behavioristic part of economics research and educational processes improvement, hereby the interest in major choice might only increase due to the "Generation Z" disclosure aspect.
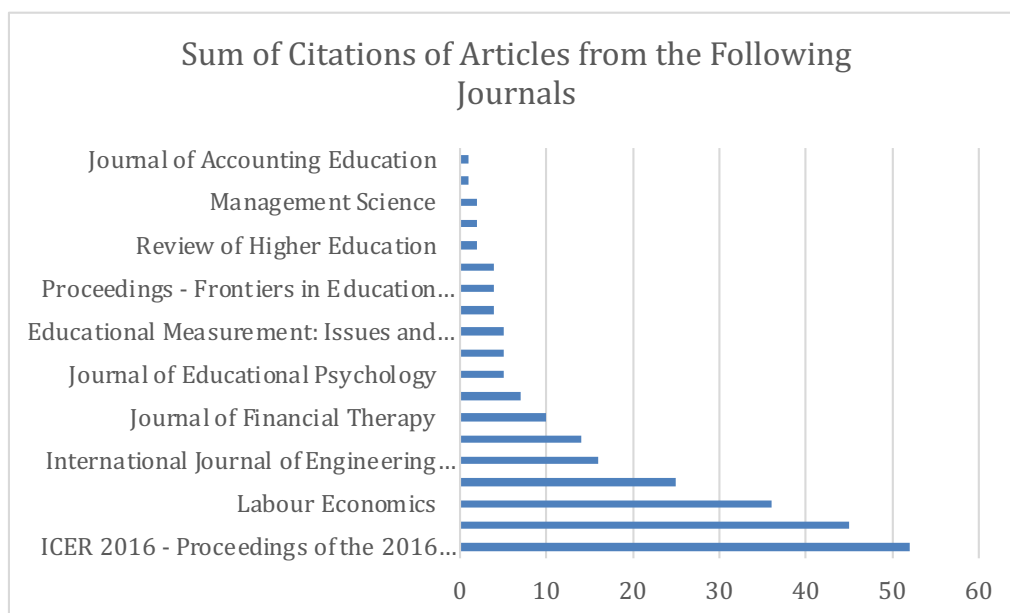

Fig. 7 – Number of citations in the journals with "major choice" keyword in 2014-2022.

Figure 8 demonstrates that papers devoted to the major choices' studies were represented within the following journals: Economics of Education Review, AREA Open, International Journal of STEM Education, Journal of Diversity in higher education, Journal of Labor Economics, Journal of Political Economics, Quarterly Journal of Economics, etc. These named journals mostly publish studies on education and learning, and especially they focus on the majors as STEM-related majors, and business majors such as finance, accounting, and so forth. Frontiers in Psychology, Journals as International Review of Economics Education, Innovative Higher Education, Italian Economic Journal and Computer Science Education were not included into the Figure 8, because they had a value of 0 citations. However, it should be mentioned in this paragraph.
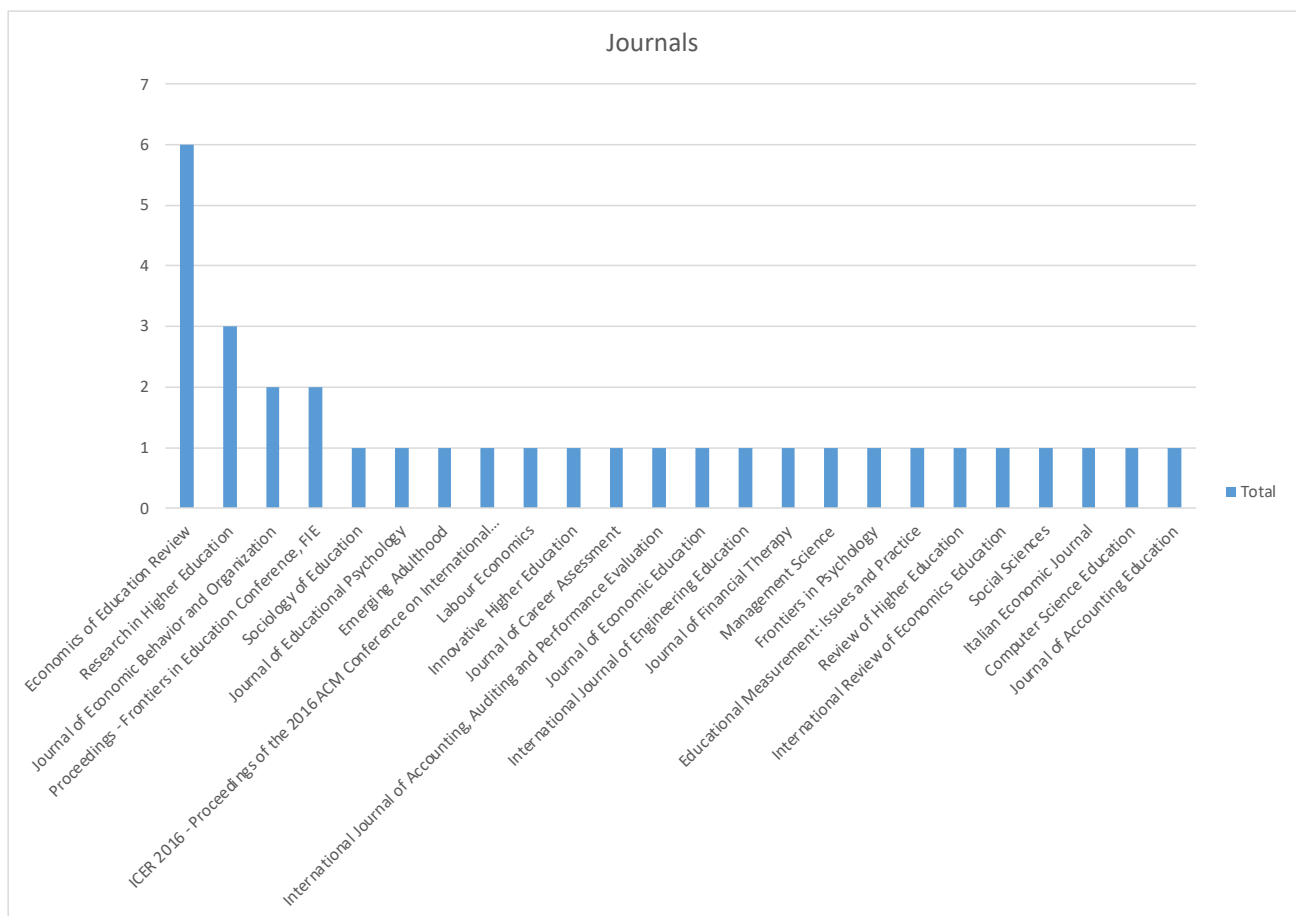

Fig. 8 – Journals (sources) and the number of articles in each of them related to "major choice" in 2014-2022.

In order to reveal the term frequency, it was applied literature review software - "VOSViewer". From this software, we opened extracted abstracts as a CSV file and chose to create a map based on keywords and terms occurrence. It demonstrates the terms as "student", "major choice". "engineering", "study", "science", "woman" and so forth. It mostly showed the nouns and noun phrases. Next to the terms, there is a number of occurrences that shows how many times the term appeared in the abstracts of the extracted data. The selection was based on times of occurrence that was higher than 10. The next column is called "relevance" and it scores the relevancy of the terms, so it provides limits by excluding not relevant for the study common terms of scientific papers. So, the relevance score tends to show the specific terms if the score is

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higher, while the low score shows the general words and phrases that cannot belong to the specific topic.

Figure 9 demonstrates the visualization of the terms network based on the data of terms occurrence created with VOSViewer software from extracted abstracts of chosen literature related to "major choice" in 2014-2022.
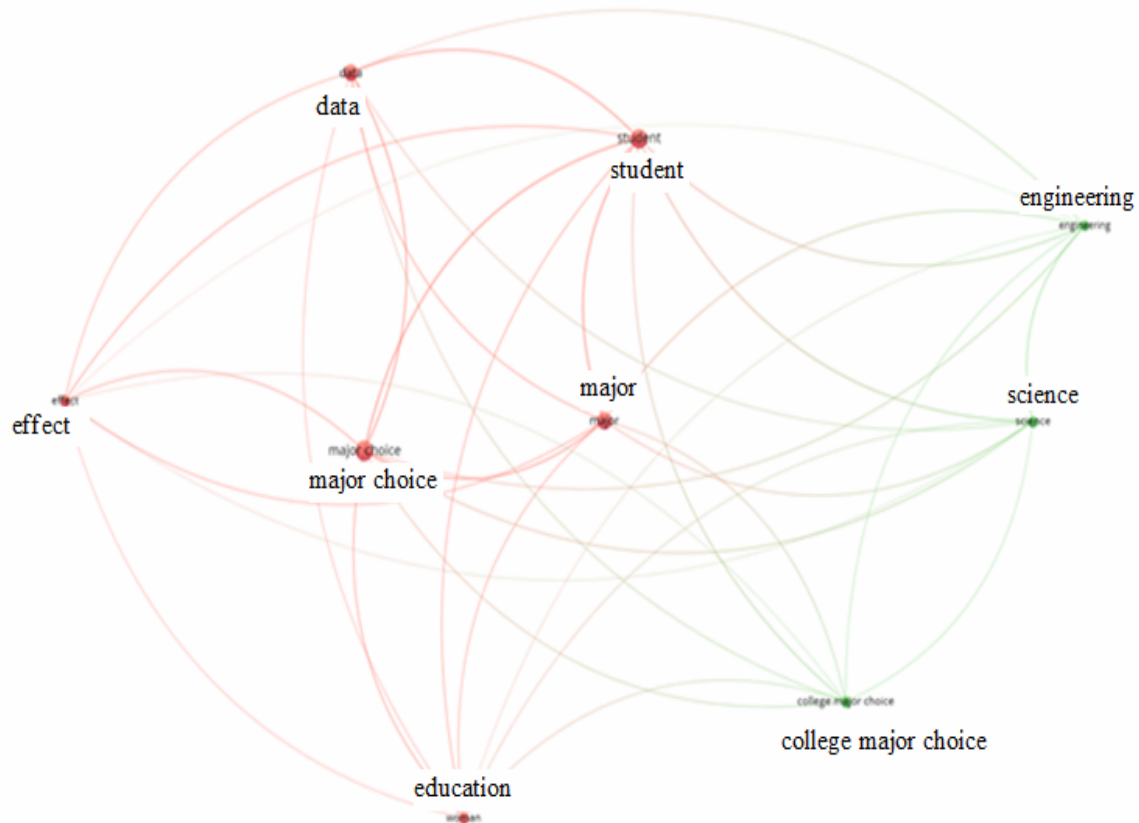

Fig. 9 – Network visualization of the frequently occurred terms from VOSViewer.

The distance between two terms in this figure approximately indicated the relatedness of the terms. In general, the closer two items are located to each other, the stronger their relatedness. Also, the size of the circles determines the weight of the term represented. Figure 9 illustrates the minimal weight of terms such as "college major choice", "engineering", "science" which approximately means less occurrence related to the number of papers that incorporates these terms. Lines between the circles represent the links between the terms. At the next stage, the abstracts of the extracted search results were analysed.

This research included only papers that provide guidance on factors that affect students' decision-making in major choices. In some cases, the term "major choice" was related to major switching and dropping out from the courses and from the university. Therefore, those results were not included in the analysis part of this article but were taken into consideration for identifying the variables.

While analysing the papers, we found out that 61% of the selected studies used a quantitative method of research related to administrative data and scaled questionnaires, 33% of the research was done with mixed methods, and the other remaining studies were done with quantitative methods of the research as interviews.

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Finally, we identified that the limitations of the written works were related to the geographical aspect as far there was no evidence from Central Asian countries (in Scopus database) and a lack of studies based on the evidence from East European and African countries. Most of the studies were conducted in the United States of America. Also, we should mention that the universities and educational systems of each country might vary by the enrolment stages, grade point average measurements, demographic and cultural differences, as well as social differences in each state due to the different economic dynamics and developments.

Finally, we provide attempts to disclose the consideration of digitalization within processes of major choice making. In this regard, we found out the theoretical gap within the existing studies. Moreover, we discovered the analysis of the role of media in the decision-making process of prospective students when gathering information about major choices, within two papers (from the SLR). However, there was a scarcity of consideration of social media's influence. The role of websites of the university was discovered only from the lens of the information source on majors, and the focus was not put on social media as a factor influencing students' major choice.

Therefore, it is a huge gap, especially considering Generation Z's digital attributes related to digitalization preferences. Besides, due to a lack of studies devoted to the major choice of students who are representatives of Generation Z, we conclude, that arises a necessity to fill the conceptual gap by reconsidering the models suggested in the literature review from the standpoint of the "Z generation students – digitalization" lens in order to suggest new discourse and provide future research agenda on the issues mentioned above.

4 – Results

After the investigation, we revealed, that there are several sets of factors that influence the major choice of the prospective student. They include *personal attributes* such as academic performance at school, on introductory courses, the personality of the students, various motivations, self-image, interest in the subject before choosing a major; *students' characteristics* such as gender, age, ethnicity or race, socio-economic status; *parental characteristics* as their education level, family income, family members' majors or jobs; as well as *influencers impacts* (such as parents, siblings, teachers, advisors (counsellors on career, major), peers, etc.).

Providing a comprehensive analysis of the studies devoted to the students' major choice determinants we revealed that mentioning social media or other digitalization effects was limited. It is worth admitting that social media influence concerning the process of choosing a university is already considered, but not in terms of major choice. The consideration is narrowed to the rare notice of social media as an instrument of the information gathering on major choices. However, most studies that discover the ways to search for information about the majors consider personal advice face-to-face from their teachers, advisers, parents, friends, siblings, and peers, omitting the social media factor (Anelli & Peri, 2015; Hastings *et al.*, 2016; Mishra *et al.*, 2017; Jaradat & Mustafa, 2017; Zölitz & Feld, 2021). Consequently, the findings of these studies do not provide an understanding on how social media changes or influences the major choice of the prospective students, taking into account Generation Z is considered smartphone-addicted. Simultaneously, the literature provides strong evidence of the influence of social media on the users' behavior, this effect is also highly connected with peculiar characteristics of Generation Z, for instance, tech-savvy, sustainable consumerism. (Wong, 2021; Khalil *et al.*, 2021). For instance, we consider an illustrative sample with this respect. The model suggested

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by Vrontis *et al.* (2007) (considered in chapter 2.2) emphasizes the increasing social media influence with decreasing family influence on the students' decision-making processes. Withal for the representatives of the Generation Z inherent to consider information retrieved from the internet as more relevant in comparison to family opinion as it was previously inherent to Generation Y (Xuan Truong Nguyen, 2019).

Hereby, consideration of the social media influence only as an alternative source of information is limited and not sufficient, especially in terms of major choice at college or university. Nowadays social media is not just a source of information, its role is multidimensional. It together with a set of other digital applications is a self-sufficient communication channel and, furthermore, a tool that can provide and support all types of activities at the whole stages of the "HEI-students" interaction. Despite this, even a recent attempt to discover the media component is narrowed to the consideration through the lens of the university brand management and media targeting improvement for more effective prospective students' engagement rather than a comprehensive study of the social media phenomenon within students' major choice decision-making. At the same time, the study examining students' "electronic word-of-mouth (eWOM)-seeking behaviours on social media" while choosing the university outlined the key type of searched information: "university reputation, career prospect, learning, administration, and student life" (Le *et al.*, 2018). Thereby, social media via information gathering processes influences all chains of students-decision-making. The influence provided could be direct or indirect. For instance, dealing with the feedback of the actual students launches the peers' effect at a much earlier stage and conceptually expands it. Moreover, it highlighted that HEI is increasingly employing social media (as a communication channel) and online learning platforms thereby providing digital change within the environment in which students' major choice model has to operate. The additional research question that the study is to emphasize but put out of the brackets is the consideration also conceptualization of the Z generation universities (universities with peculiar characteristics which meet the needs of the Z-students and realize their potential most efficiently by responding to the actual job market requests).

Thereby, we state that the digitalization of social life did not receive adequate consideration in the studies related to the students' major choice and this scientific gap is to be fulfilled to avoid misleading inferences concerning modern students' decision-making processes, motivations, and determinants of their choices. To find out the promising avenues for the "digital-effects" conceptualization within Z-students' major choice studies we proceed with disclosure of the determinants of the models' sample (introduced in chapter 2.2) from the standpoint of the analysis of the social media influences displays followed by the discussion on the potential approaches of these effect incorporation within students' major choice models.

To do so we proceed with the reconsideration of the main categories of the background model (see Figure 1) in the "Z-students-digital" frame. Due to the model structure, the mentioned frame effect appears within the determinants joined in the "external influences" set. According to this model the category "college choice of students" is not directly affected by digital transformation as it is based strictly on individual grades and personal achievements. However, we state that in fact, it provides additional opportunities for HEI to expand the range of the prospective students' selection. As was noticed above the strongest and most obvious impact within the mentioned frame was revealed in relation to the "HEI-students" communication mechanism, however, two other subsets of the external influence determinants

were also affected. The online learning platform and distance learning development provide deep changes in fixed college characteristics estimation which in the model is described through such variables as financial aid availability of the program. In fact, this effect goes far beyond overcoming HEI location barriers and financial pressure easing, it provides the smoothing of the impact of socialization patterns both at the level of a single social system and cross-country level. Reducing fears of failure to overcome the barriers of socialization in different social systems whether it be ethnic, gender, or other nature highly corresponds to both phigital and individual Z-students characteristics (eager to explore new technologies in connection with underdeveloped social skills). The latter provides a direct impact on personal interrelation.

The changes within processes which underpin the shaping of the students' intentions by the "significant persons" influence (which in its turn is the third component of the 1981-background model and represents the determinants of the subjective norm within TRA framework analysis) are the consequences of the redistribution of significance weights according to "from family to social media" trust shift. Susceptibility to trends, blogger-influencers recommendations, highly developed communication through social media together with high interest in the mastering of technological sophistication of the Z Generation provides phenomenon of the changes in nature of the significance scale from vertical (hierarchical) to horizontal which in addition reflects modern social life patterns. Thus, we observe several important effects of the "Z-students within digitalized higher education sector" on each component that provides the general expectation of college life students, which according to the background model causes the students' choice of college.

The second type of model sample which is based on the TRA framework (see Figure 2) concentrated completely on the students' major choice and is more illustrative from the standpoint of exploration of the particular individual characteristics influence. The mechanism of influence on the subjective norms and "from vertical to horizontal" change in the nature of the salient referents' influence was mentioned above. Moreover, covering the issues of reducing the socialization pattern impact, we state that considering the effects of the "Z-students-digital" frame reopens the gender issues. According to the analysis of the example of the students' major choice in the information systems area, it was revealed that social norms influence female students' intention to choose an informational specialty significantly in comparison to male ones. In addition, the gender structure of peers is a factor of great importance for achievement in the higher education sector as well as for the further career path. Hence, considering socialization patterns' impact weakening due to the factor mentioned above we suppose the change in the significance of the factors and change effects of the gender for instance distance learning can smooth the effect of the gender structure of the peers. Thereby, as far previously the role of gender as a significant determinant of the intentions to choose a major was approved in a number of studies (Anelli & Peri, 2015; Ochsenfeld, 2016; Perera & McIlveen, 2018; Griffith & Main, 2019; Enget et al., 2020; Arnold, 2020; Quadlin, 2019; Ding et al., 2021; Zolitz & Feld, 2021; Kugler et al., 2021; Feld & Zolitz, 2022), we state that there is a need to provide a further study of the socialization processes influence and check the level of the "Z-students" effect's impact on the gender role within students major choice.

Furthermore, we suppose that such effect provides influence on the job-related (job availability, security, salary) and image-related beliefs (social and personal image) as constituents that form the attitudes towards the choice of the major. The commitment to the "weconomists", "hyper-custom" (as an intention to adjust the job descriptions in an individual

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way), "fear of missing out something" concepts in addition to the personal emotional and financial safety priorities form the basis of the change in strength, degree, and structure of the determinants which is to define the role of the Z-students major choice. For instance, job availability could be assessed by Z students in a completely different way (in comparison to Y generation students) or based on the not typical features or not classical interpretations.

From the standpoint of the desired lifestyle as a result of the benefits that are supposed to be gained within the educational process on the chosen major the individual characteristics appear to be significant determinants. The third model (see Figure 3) puts emphasis on the attitudes and values which are related to the category of personal freedom and force on individual achievement. It responds to the Generation Z characteristics related to the "Do It Yourself - fierce and independent" concept. Within the individual determinants considered in the model operates the set which is to reflect Z-students features is personal attributes determinants (personality, self-image, etc.), while such "constant" attributes as race, gender, socioeconomic status, etc. are placed in a separate set - consumer attributes. Such separation within the model makes the subsequent analysis of the direct impact of Z-students' characteristics more precise. The disclosure of the environmental determinants considered in this model coincides with the previously described mechanism related to the change in family, peers, and media influences. As for the third group of institutional determinants, it covers digital aspects of the "HEI-students" communication. Moreover, a 5-stage decision-making process suggested in this model also is influenced and shaped in the "Z-students-digital" frame, mostly on the need recognition, search process, and information gathering stages. So, we assume that influence appears in both the model structure and environment in which this model operates, strengthening or weakening the impact of the determinants.

Thereby, we observe the unique conceptual intersection of the development of the social media role as an "influencer", digital transformation processes in societal life, and the complete representation of the Generation Z among HEI students which opens new opportunities for the comprehensive analysis and upgrading of the students' major choice studies. Such significant changes demand conceptualization and provide background for the further students' major choice model development in the frame of mentioned unique circumstances.

5 – Discussion and Conclusion

Providing the systematic literature review, we revealed the strong demand for the conceptualization of the theoretical knowledge on the students' major choice study at a new evolutionary stage. The study states that this stage is defined through the three-dimensional lens:

(1) new peculiar individual features inherent for the people who were born in the late 1990s and 2000s and represent nowadays modern students;

(2) acceleration of the digital transformation in social life in general and higher education sector in particular;

(3) the expansion of the social media communicational functions and its acquisition of the role of an influencer in itself.

The main challenge in this respect is to answer the question of how such a conceptual framework can be applied and investigated in the most comprehensive way in order to provide HEI with appropriate recommendations and enrich behaviouristic knowledge with more

accurate students' behaviour comprehension in regard to the major choice decision-making processes. We suggest that depending on the focus of the research the "Z-students – digital" effects are to be considered in two ways. From one side the phenomenon is to be disclosed as a separate group along with the "subjective norm", where it is appropriate to combine the determinants, on the other side it is reasonable to separate determinants and locate them align with existing determinants. The first approach is to be applied to understand the weight of digital effects influence. The second approach is more applicable if the purpose of the study is to analyse general trends or measure the strengthening or weakening impact on the common factors' effects (gender, financial alternatives estimation, fixed HEI characteristics influence, etc.). It is especially important for those specialties in which accepted socialization patterns have a significant impact on the students' intention to choose the major (for instance, STEM, informational systems, etc.).

The choice of variables also depends on the aim of the study in correspondence with the approaches mentioned above. In order to provide an opportunity to measure the influence of the attributes inherent for Generation Z, it is reasonable to separate individual attributes and personality ones while considering the individualistic characteristics. While the first, will cover such characteristics as personal attributes, characteristics of the students as gender, ethnicity, social status, their families, etc., the second one will incorporate variables that describe Generation Z features as tech-savvy, the relationship between smartphones and the internet habits, etc. Such an approach is considered to be promising within the analysis of the students' major choice as far as provides a tool to form the generic variable that is to incorporate particular "generation" characteristics. It would provide additional possibilities for further empirical analysis to estimate the significance of the impact and a comparison analysis between different specialties, universities, regions, and countries.

Another challenging avenue for future research is measuring the influence of the digitalization level on the students' major choice as far as it is a new phenomenon related to new generation features (digital natives). It is of great significance to work out appropriate variables in order to estimate the level of "digital" effects, taking into account that digitalization levels might be different in developed and developing countries. Therefore, appears a need to adjust the methodology of the analysis of students' major choice to "Z-student – digital" frame. The classic set of methods applied for the study and modeling of students' behaviour with respect to the defining major choice under uncertainty covers the theory of reasoned action, theory of planned behaviour, and integrated behavioural model method. In addition, it is reasonable to estimate the explanatory potential of the cumulative prospect theory (CPT) potential and multi-attribute decision-making theory (MADM) for modeling students' behaviour within the decision-making process in the "Z-student – digital" frame. On the one hand, CPT has the potential to reflect the students' perception of each determinant and is "well suited for modeling the psychological phenomenon of diminishing sensitivity" (Fennema & Wakker, 1997, p. 53), for instance, with respect to the analysis of the "slightening effect" of the socialization patterns. On the other hand, the application of the MADM theory framework allows to depict the major choice decision-making process within multiple internal and external choice criteria in a complex and uncertain environment.

Moreover, despite Generation Z in several regions that might vary depending on the country's socio-economic development, the globalization of this generation might provide to a certain extent a common influence on the individuals' decision-making processes. Since the

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studies devoted to Generation Z identified that region and historical events taking place in these regions are influencing the commonly shared features of generations, it is reasonable to take into consideration the region where the Generation Z representatives are located (Dolot, 2018; Dimock, 2019, 2022). Such an approach allows identifying the social and cultural norms in that region which affect some of the features of commonly shared characteristics of this generation. Therefore, we need to understand how different the generations of the same age cohort are in different geographical locations and provide a comparative analysis of the same variables in various territories (countries, provinces, cities). In this respect, the surveys which are based on conducting interviews and questionnaires (self-reported, etc.) are supposed to have a great explanatory potential in the context of the comparison of the Generation Z representatives of the same age in different regions.

For instance, in the context of the analysis of the socialization patterns "slightening" effect with respect to the gender factor disclosure, considering the "phigital" feature of Generation Z. It is assumed that the application of these methods would provide a possibility to find out whether the degree of influence of the gender factor on the propensity to choose a major, for example, represented by the majority of men, has changed. In such a way to discover whether the gender structure will change within such majors as STEM which suggest online education and do not require face-to-face interaction with vice-versa gender representatives in the same study group. The previous studies analysing peer effects on choosing a major or students' achievements considered only offline education due to the classical perception of the educational processes in HEIs (Luppino & Sander, 2015; Berthelon et al., 2019; Feld & Zölitz, 2021). However, there is a lack of information on how peer effect in the group will be correlated if, for example, female students could interact with their male peers mostly online, i.e. will female students demonstrate a higher propensity to choose male-dominated majors if they have a chance to study (only) online and how this will affect their achievements in male-dominated majors as well as men in female-dominated majors.

These questions have to be addressed, as a part of the digital natives' disclosure, understanding of the level of trust of representatives of Generation Z on social media influencers as well as whether it is considered as something that can provide changes in the decision with regard to the major choice. Hereby, the "Z-students – digital" discourse within further studies plays a significant role in the theoretical and practical implementation of the knowledge on the students' major choice decision-making.

However, the limitation of the article is that it focuses primarily on studies conducted in developed countries, particularly in the United States, and may not fully represent the experiences and perspectives of individuals in other parts of the world where cultural and societal norms may differ as well as the level of socio-economic development. Additionally, while the article highlights several promising strategies for reducing implicit bias, it acknowledges that these approaches are not a panacea and may not be effective in all contexts.

Suggested new discourse for further research we stated that fostering the digital transformation in social life in general and higher education sector in a particular set a new perspective on the decision-making processes among students who are Generation Z representatives. The strengthening of the social media role opens questions on how influential social media are persuading or informing the students about their future majors, and specialties at universities, describing the widening of the social media communicational functions. This study seeks to set promising research avenues to provide more comprehensive conceptual

framework to enrich a theoretical knowledge on students' major choice decision-making processes and provide the practical implications for HE sector to address modern challenges of the digital transformation of the society.

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