Factors Affecting Z Generation on Selecting Majors in The University: an Indonesian Case

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Abstract

This research aims to identify the factors influencing students in deciding their university majors, particularly in Indonesia. This study uses a quantitative correlational design aimed to determine the relationship between internal and external factors influencing students in deciding their university major. The study involved 200 senior high school students, categorized as Generation Z in the last grade (50% boys and 50% girls), from two districts in South Sulawesi Province, Indonesia—Maros and Makassar—chosen through a purposive sampling method. The career selection instrument was adapted from career choice questionnaire (CCQ), and students' major selections were identified using the major selection survey. Findings show that internal factors influencing Gen Z in selecting their university majors include families, academic achievements, and culture, while the influential external factor is the quality of education. Another finding showed that Gen Z are more influenced by internal rather than external factors in deciding their university majors.

Keywords: *Generation Z, selecting majors, career choice, senior high school students*

Introduction

Higher education is a critical phase of career exploration and identity building (Shin et al., 2018); therefore, it plays a vital role in determining students' future careers. Each university offers various majors or study programs such as Mathematics, Biology, Social Sciences, Engineering, and Language. Mistakes in selecting a major at university level can negatively impact students' future careers (Aryani et al., 2016). The ability and option to choose a major is essential to be introduced to students when they are in senior high school. The selection of a major in university is part of a career choice, and this is an important topic that has been studied by many researchers previously, in the contexts of before and after graduation from universities (Akyol & Boyacı, 2020; Bal & Arikan, 2020; Budiharso & Tarman, 2020; Green et al., 2019; Lee & Lee, 2020), or before entering a university (Adekeye et al., 2017; Afful, 2019; Bikse et al., 2018; Suryadi et al., 2020).

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Making a career choice before entering a university means that students are required to select a right major there, once they graduate from senior high school, while making it before graduating from a university means that students need to choose a profession or job for their lives after graduating from university.

Some problems were found related to the selection of majors in university. Aryani et al. (2016) found that many senior high school students experience difficulties in choosing a major or department in university. The lack of information and guidance from teachers and parents are the primary factors behind this condition. Therefore, career guidance from educators can be very beneficial for students. There are many students who end in majors not right for them, causing them to feel uncomfortable and stressed during university learning (Çetinkaya, 2019; James, 2018; Romano et al., 2019). Another study investigating the negative impact of mistakenly choosing a major was conducted by Marti'ah et al. (2018), proving that many students encounter discomfort with the majors they choose, resulting in drop outs from university (Miftahurrohmah & Wulandari, 2019).

To assist students in selecting a major in university, it is essential to identify some influential factors in the selection process. Some earlier studies have suggested that personal interests and academic achievements influence students' career choices (Aguado et al., 2015; Kazi & Akhlaq, 2017; Mtemeri, 2017). Interest can be defined as the tendency directing students to choosing a major, since they are happy and interested in their choice; for instance, when the students are interested in math, they choose the math department at university. Besides interest, this study also proves that academic achievement is also a consideration when a student is deciding a major. For example, if they have an achievement in the Physics Olympics, they choose the physics department.

Other factors that can influence students in deciding their university major are financial support, gender, and job opportunities (Aguado et al., 2015; Johnson & Mortimer, 2002; Mutekwe et al., 2011). Many students choose a major considering whether it can truly prepare them for a good job and train them in social skills. Furthermore, students also consider the estimated cost of the major. For example, the medical science program is quite expensive compared to other programs. Students from the lower economic families choose a program according to the family's financial abilities. This condition is assumed to influence students being more selective in choosing a study program at university. Besides job opportunities and financial reasons, the study also

proves that gender also becomes a consideration. For example, male students tend to avoid choosing culinary art because it is generally assumed to be feminine, while female students avoid selecting machine engineering or other subjects identical to physics.

Interpersonal factors such as family and peers also play an essential role (Kumara et al., 2019; Pascual, 2014). A survey conducted by the University of California Davis, The United States in 2004, on 3187 students showed that 60% of students stated that their family was involved in their education (Park, 2004). In this case, they also consider their children when choosing a major in university. Moreover, many students choose a university major based on their friends' suggestions, and even some of them follow their friends to choosing the same major. This condition is referred to as a conformity attitude (Istiqomah et al., 2018).

Studies above show that the factors influencing students to choose a major are varied, because they also depend on the development of knowledge and technology. These two aspects are very influential on students' attitudes. Zemke et al. (2000) explained that attitudes change with the generations, such as the veteran generation (1925-1946), baby boomers generation (1946– 1960), Generation X (1960–1980), Generation Y (1980–1995), Generation Z (1995–2010), and the Alfa Generation (2010+). When correlated with this theory, it can be assumed that various factors influence each generation in selecting a major in the university. This research examined the factors affecting Gen Z in deciding their university major. This generation is identical to the internet generation because they are surrounded by highly developed digital instruments, and they are always online using various devices (Bencsik et al., 2016). The findings of the current research might be different from the earlier ones because it investigates Gen Z as the research object, while previous studies have focused on Gen X or Y.

Some earlier studies investigating the factors influencing students' university majors section did not divide them into internal and external groups. According to Lent et al. (2000), a student's major section is influenced by two kinds of factors: internal and external. Therefore, in this study, we investigated them separately to identify the dominant one influencing students' decisions. Another difference in this study is the instruments that were used. Earlier studies focused on comparing between variables of parents, peers, finances, academic achievement, gender equality, quality of education, interest and the career selected by the student. Other variables investigated in developing the research instrument were culture and job opportunity,

based on studies conducted by Maree (2020), Ray et al. (2019), Ulas and Yildirim (2019), which show that both variables also potentially influence students in selecting their university major.

Research Questions

Based on the background, it can be concluded that there are two main factors influencing students in selecting their university majors, including internal and external factors. Therefore, the questions of this study are formulated as below:

1. How much does each internal factor differently influence students in deciding their university major?
2. How much does each external factor differently influence students in deciding their university major?
3. How do internal and external factors differ in influencing students deciding their university major?

Research Hypotheses

Based on the research questions and literature review, we hypothesize the following:

1. Each internal factor differently influences students in selecting their university major.
2. Each external factor differently influences students in deciding their university major.
3. Internal factors are more influential than external factors on students in deciding their university majors.

Literature Review

Choosing a Major in the University

Each year, students compete to apply to a university of interest. However, many students face difficulties when selecting a major. Guidance and counseling teachers of senior high schools are responsible for guiding students in selecting a major, according to their interests and academic achievements. Students who are good at science usually choose a science major, the ones interested in social sciences or economics choose social science subjects, and others who enjoy studying languages decide to apply for a language subject. However, many students are confused about deciding on a major. It normally happens since the major they choose becomes the first gate to their future career. The selection of the university major begins when students are in senior high school via choosing one of the three programs generally offered by the school, which are science,

social science, and language. The program they choose at this level projects a more specific major for their university. Majors or study programs are divisions of faculty that are responsible for managing and developing a subject. In general, a university consists of some faculties, and each faculty consists of some majors or departments. Ideally, students select their university majors based on their interests, talents, and skills (Intani & Surjaningrum, 2012). Porter and Umbach (2006) mentioned that the selection of a major in university is a necessary decision-making process. Generally, students face difficulties in university because they only follow their friends in choosing similar majors, having no understanding of the major they choose, and not knowing their interests or skills (Intani & Surjaningrum, 2012; Silalahi & Yuwono, 2018). The selection of a major is a step that must be passed by each generation, including Gen Z, before deciding their career.

Career choice is one of the significant challenges faced by Gen Z. According to Bandura (1999), an individual's environment, talents, skills, and academic achievements potentially influence the career they choose. When a Gen Z student chooses an incorrect major in terms of their personality, it can bring them failure and disappointment. Therefore, the selection of a major correlates with the selection of a career. Selecting a wrong major can direct a person to a wrong career in the future. Furthermore, Kazi and Akhlaq (2017) mentioned some factors influencing students in selecting a major, including interest, academic achievement, gender, peers, financial reasons, family, and quality of education.

In selecting a major, there are some problems faced by Gen Z students in various aspects, including psychological, academic, and social relationships. The psychological problem is, for example, the discomfort in joining lectures because of choosing a major not based on one's interest. The academic problem can be low learning achievement, possibly leading to dropping out (Nelissa et al., 2018), and problems regarding social relationships can be, for instance, the students withdraw from their social life (under confident) because of being uncomfortable with lectures (Intani & Surjaningrum, 2012).

Theories of Generation and Differences of Each Generation's Attitude

Generation is defined as "a set of historical events and related phenomena that creates a distinct generational gap" (Parry & Urwin, 2011). It is the differences in individual characteristics making each generation unique in many aspects, including their attitudes and behaviors (Kupperschmidt, 2000; Salleh et al., 2017). Theories about generational differences were

popularized by Strauss and Howe (2000), who differentiated the generation into five groups: Baby Boomers (1946–1960), Generation X (1960–1980), Generation Y (1980–1995), Generation Z (1995–2010), and Alfa Generation (2010+).

The Baby Boomers believe that there is a chance to make a change, but it generally needs idealism. They are highly optimistic and hard workers, need personal appreciation, believe that they can change and develop themselves (Strauss & Howe, 2000). Generation X tend to be independent and seldom ask others for help (Borges et al., 2010). They have a good awareness of diversity, think globally, can balance work and life, are informal, rely on themselves, prefer a more practical approach to working, and enjoy working with new technologies.

The activities of the Generation Y or the millennials include utilization of instant communication technologies like email, SMS, instant messaging, and social media like Facebook and Twitter. Generation Y has a more open communication pattern as compared to its predecessors. These generations are categorized as fanatic social media users, and their lives are highly influenced by the development of technology (Lyons, 2004; Salleh et al., 2017). Gen Z has some similar characteristics to Gen Y, but Gen Z are multitaskers; they can surf social media while listening to music and doing their job on the laptop. Most of their activities are connected to the Internet. Since they were young, they have been familiar with sophisticated technologies and gadgets that do not directly influence their personality.

Generation Z and their Behavior

Generation Z is classified as being born between 1995 and 2015 (Schroer, 2008; Wiedmer, 2015). Generally, they are referred to as the iGeneration or internet generation (Kirchmayer & Fratricová, 2020). They are usually connected via the Internet, exploring cyberspace, and running their activities using the existing sophisticated technologies, all of which they have been exposed to since they were young. Generation Z, further called the digital generation, grows and develops under the dependency of digital technology. Thus, the introduction of technology and cyberspace is highly influential on the development of their lives and personalities, including when they decide their university major. Information and technology are parts of their life because they can surf the internet, which has become a global culture, thereby influencing the values and the goals of their lives, separating them from previous generations. Additionally, in education, Gen Z are less interested in classroom learning, are more critical, enjoy exploring new ideas on the Internet, and are more independent, yet more individualistic with less social skills (Renfro, 2012). Therefore,

Gen Z prefer to find out information from the Internet rather than other resources when selecting a major for university.

Santosa (2015) mentioned some indicators for Gen Z or the iGeneration kids. 1) They have big ambitions to be successful and are positive and optimistic about reaching their dreams. 2) They like to solve issues in more practical ways and do not like to spend much time and indulge in the long process of observing and solving problems. 3) They like freedom and have good self-confidence. Freedom, in this case, refers to the chance to demonstrate their ideas, creation, and expression. 4) They like details, are critical and comprehensively observe a problem or phenomenon. They enjoy anything that requires them to explore. 5) They need recognition in the form of rewards for what they perform or possess. 6) This generation is very proficient in using various information technologies. They prefer to communicate through cyberspace, like social media, rather than spend time talking face to face with someone.

Career Selection Research of Gen Z in University

In general, career selection is divided into two phases which are before entering university and before graduating from university. In the first stage, students are required to select the right major in the university, after graduating from senior high school, while in the second stage, they must choose a profession or job for their future. Many students plan to continue to university by are unsure about what major to choose. Research shows that 87% of students in Indonesia mistakenly choose their university major (Masriah et al., 2019).

Selecting a major is a critical period faced by Gen Z about to enter university. The process of selecting a major consists of two main steps, determining their career goals and deciding their academic major (Iglesias et al., 2012). Certain aspects of selecting university majors have been studied by several authors (Holland, 1996; Krumboltz et al., 1976; Super, 1990). However, factors affecting an individual's deciding on specific majors at university are sometimes variously related to socio-demographic, cultural, and environmental elements. In developed countries, problems related to the students' decision-making in terms of their career choices are figured out in the school via educational counselors and family. However, in Indonesia, as a developing country, the problem stays unsolved because of limited knowledge related to career choice, especially the causative factors behind selecting a major.

Moreover, Lent et al. (2000) noted that a student's major selecting is influenced by internal and external factors. The major selection becomes a complicated and daunting task because the

decision is influenced by various factors that are categorized into extrinsic and intrinsic groups, or a combination of both (Ahmed et al., 2017; Janiec et al., 2019; Montgomery et al., 2019; Wati et al., 2019). These factors can be either inhibitors or supporters for a student's choice of career in the future. As per the consideration, career becomes a result of the interplay between individuals within organizational and social structures. It yields well to be analyzed from diverse perspectives, ranging from occupational psychology to organizational sociology (Özbilgin et al., 2005).

Some studies have pointed out some internal factors influencing students' major selection for the future, such as personal interest, talent, academic achievement (Aguado et al., 2015; Johnson & Mortimer, 2002; Van Overschelde & Piatt, 2020). Interests, talents, and personality are individual variables that correlate with factors that might influence students in selecting majors (Adams, 2014). A study conducted by Alexander et al. (2011) on South African students found that personal interest is the main factor that influences students in selecting a major; these interests also play a pivotal role in developing their goals.

External factors influencing a student include the relationship between parents and children. The studies of Peel et al. (2018) and Tinsley (1997) proved Anne Roe's theory regarding major selection, that there is a relationship between parent/child interactions and the way a child chooses a major. The interaction between parents and children produce a basic personality orientation, that in turn, influences the development of the work personality and the ultimate vocational behavior of the individual (Tinsley, 1997). As per the consideration, it can be concluded that the Anne Roe theory believes that factors affecting individuals in choosing a major are based on the external components, such as the interaction between parents and children.

Although parents influence career choice, gender and cultural beliefs also contribute to the major a student selects, as the patriarchal culture believes that women and men hold different kinds of jobs. This view causes the differential occupational distribution among women and men, mainly when they try to explain the average wage gap between different genders (Correll, 2001). Cultural beliefs about gender and task competence bias also play a role in the selection of a career. As the competence of a specific skill is thought to be necessary for a particular career, the belief that a specific gender is excellent in some particular task but weak in other tasks leads students to limit themselves while choosing a particular profession (Correll, 2001).

In a developing country such as Indonesia, students have low confidence in determining their own goals and tend to follow their parent's discipline in choosing a major at university and

pursue a career according to their parents' professions. According to Humayon et al. (2018), the selection of a career is also influenced by the parents' ability to provide funding for their children's education. The parents, as single financers, have significant power in the selection of major and future careers for their children. However, this is contrary to a study by Peel et al. (2018), which states that the student's career decision coordinate significantly with their necessities, such as personal interest and talent as well as academic achievement. Based on the explanation above, this research aimed to identify the factors influencing Generation Z in selecting their university majors, particularly in Indonesia

Method

Population and Sample

The population consisted of high school students from two districts in South Sulawesi, Indonesia. Researchers and team advertised the study via posters and online advertisements, targeting schools in South Sulawesi. Initially, 300 participants were contacted by the researchers, but only 200 students (50% boys 50% girls) returned the complete consent form and the parent's consent form, and only they were asked to complete a set of questionnaires.

Instruments

This study employed the career choice questionnaire (CCQ) by Kazi and Akhlaq (2017), and the major selection survey developed by researchers in this study. The following description explains each measure in this study.

1. **Career choice questionnaire (CCQ)**

This study adapted the CCQ by Kazi and Akhlaq (2017), including the translate-back translate, readability test, validity, and reliability test. The confirmatory factor analysis (CFA) test ($N = 200$) suggested that the questionnaire has eight distinct dimensions (i.e., family influence, peers influence, gender, academic reasons, media influence, financial reasons, interest, the influence of others) with RMSEA = .07, CMIN/DF = 3, and GFI = .96. Each dimension showed acceptable reliability coefficients ranging from .70 to .82. For this study, the questionnaire was reconstructed to produce two major dimensions: internal career choice and external career choice.

a. **Internal career choice questionnaire (ICCQ)**

The ICCQ was constructed using four dimensions of Kazi and Akhlaq's (2017) CCQ, including family influence, interest, academic reasons, and gender. The dimensions were chosen by two trained raters (Cohen's Kappa = .91) by selecting only the ones that internally influenced students' career choices. In addition, students' culture which involved their values was also included. Construct validity test using the CFA confirmed that the ICCQ contains five dimensions (RMSEA = .06, CMIN/DF = .2, and GFI= .95), with the Cronbach's alpha coefficients between .70 to .80 for each dimension.

b. **External career choice questionnaire (ECCQ)**

The ECCQ followed the same procedure as the ICCQ construction. The two trained raters also yielded almost perfect agreement (Cohen's Kappa = .92). The initial CFA included peer influence, financial reasons, influence of others, and media influence from the original CCQ. In addition, the questionnaire also included quality of education and job opportunity, as these two dimensions were considered essential for external career influence. However, the results showed a poor-fit model (RMSEA = .12, CMIN/DF = 6). To achieve a well-constructed questionnaire, the influence of others and media influence were excluded from the construct. The final CFA results showed a good-fit (RMSEA = .06, CMIN/DF = 3, GFI = .96), with the Cronbach's alpha ranging from .74 to .85 for each dimension.

Table 1.

Dimensions of Career Choice Questionnaire

No	Dimensions	Number of Items	Item
1	Interest	6	28–33
2	Academic achievement	4	42–45
3	Gender	8	1–8
4	Peers	6	22–27
5	Financial reason	4	34–37
6	Family	7	9–15
7	Quality of education	6	16–21
8	Job opportunities	4	38–41
9	Culture	5	46–50
Total of Items		50	

2. **Major selection survey**.

Students' major selections were identified using the major selection survey. This survey allowed students to identify their current major based on three distinct areas (i.e., Natural Sciences, Social Sciences, and Arts). This survey only has one item: "what major would you

chose for your next study?". Students' responses were categorized into three different categories (e.g., Natural Sciences) by two trained counsellors. The two counsellors showed almost perfect agreement (Cohen's Kappa = .92).

Data Collection

The questionnaires were completed at school, during class hours. Most students completed the questionnaire in less than 30 minutes. Students could leave the classroom if they refused to continue the study and could stop anytime without explanation. There were 200 students willing to participate in this study by returning the completed consent form and the parent's consent form. Table 2 shows the demography data of the participants.

Table 2

Demography of the Research Participants

	Frequency	Percentage
Parent's Profession		
Farmers and Laborers	23	11.5
Entrepreneur	79	39.5
Government Employers	60	30.0
Non-Government Employers	38	19.0
Age		
15–16	5	2.5
17–18	189	94.5
> 18	6	3
Districts		
Makassar	100	50
Maros	100	50
Tribe		
Makassar	87	43
Bugis	100	50
Others (Toraja, Mandar, Java)	13	7
Gender		
Females	100	50
Males	100	50
Parent's Monthly Income		
< IDR 2.000.000	31	15.5
IDR.2.000.000—IDR. 5.000.000	96	48.0
> IDR. 5.000.000	73	36.5

Data Analysis

This study consists of three hypotheses which were tested using a multivariate analysis of variance (MANOVA) SPSS 26 version. The dependent variable in this study was the categorical data (Natural Sciences, Social Sciences, and Arts). Therefore, the influence of independent variable on the dependent variable can be described using MANOVA.

Findings

Differences of Each Internal Factor Influencing Students in Selecting a Major in University

Table 3

Differences of Internal Factors in the Selection of University Major

	Major Selection	M	SD	M Square	Wilk's Lambda
Family Influence	Natural Sciences	17.93	2.74	156.425***	0.755***
	Social Sciences	16.06	2.47		
	Arts	19.13	3.61		
Interest	Natural Sciences	19.54	2.11	13.057	
	Social sciences	18.89	2.71		
	Arts	18.55	2.43		
Academic Reasons	Natural Sciences	11.98	1.59	20.761***	
	Social sciences	11.82	1.54		
	Arts	10.75	1.71		
Culture	Natural Sciences	10.65	2.21	18.197*	
	Social sciences	9.90	2.16		
	Arts	10.88	1.96		
Gender	Natural Sciences	17.23	2.24	13.331	
	Social sciences	16.43	3.56		
	Arts	17.03	2,46		

N = 200

$N_{natural science}$ = 57; $N_{social science}$ = 103; N_{arts} = 40

Note. ***p<0.001; **p<0.01; *p<0.05 (multivariate analysis)

Based on Table 3, we can see the Wilk's lambda significance value ($p < 0.001$); thus, there was a significant difference among the three respondent groups related to the selection of majors. Moreover, the Gen Z students tended to choose Social Sciences ($N_{social sciences}$ = 103), and a few of them chose Arts (N_{Arts} = 40). Based on the MANOVA of internal factors, there were three internal factors influencing students in selecting their university major including families (p < 0.001), academic achievement (p < 0.001), and culture (p < 0.05). However, gender was not significantly influential in the selection of majors in university.

Family factors significantly influenced students in deciding their university majors, especially the ones who chose Arts (M = 19; SD 3.61) and was less influential on students who chose Social Sciences (M = 16.06; SD= 2.47). Academic Achievement was significantly influential on students who chose Natural Sciences (M = 11.98; SD 1.59) but was less influential on students who chose Arts (M = 10.75; SD 1.71). The Cultural Factor significantly influenced students who chose Arts (M = 10.88; SD 1.96) but was less influential on students who chose Social Sciences (M = 9.90; SD 2.16).

Table 4

Post Hoc Test with LSD

	Major Selection (I)	Major Selection (J)	Mean Difference (I-J)	Sig.
Family Influence	Natural Sciences	Social Sciences	1.87	0.00
		Arts	-1.20	0.40
	Social Sciences	Natural Sciences	-1.87	0.00
		Arts	-3.07	0.00
	Arts	Natural Sciences	1.20	0.40
		Social Sciences	3.07	0.00
Academic Achievement	Natural Sciences	Social Sciences	0.17	0.526
		Arts	1.23	0.000
	Social Sciences	Natural Sciences	-1.07	0.526
		Arts	-1.23	0.000
	Arts	Natural Sciences	-1.23	0.000
		Social Sciences	-1.07	0.000
Culture	Natural Sciences	Social Sciences	0.75	0.035
		Arts	-0.23	0.608
	Social Sciences	Natural Sciences	-0.75	0.035
		Arts	-0.97	0.015
	Arts	Natural Sciences	0.23	0.608
		Social Sciences	0.97	0.015

Based on Table 3, there were some factors that had significant influences, therefore we conducted a post-hoc test with LSD to identify the most significant factors influencing the selection of a major, as presented in Table 2. Based on Table 4, students who chose Arts were significantly influenced by their families (MD = 3.07) and culture (MD = 0.97), while students who chose Natural Sciences were significantly influenced by families (MD = 1.87). Based on Tables 3 and 4, it can be concluded the research hypothesis was accepted, meaning that each internal factor, except gender and interest, significantly and differently influence students in selecting their university major (Natural Sciences, Social Sciences, and Arts).

Differences of External Factors' Influences on Students' University Major Selections

Table 5

Differences of Internal Factors in the Selection of University Major

	Major Selection	M	SD	M Square	Wilk's Lambda
Quality of Education	Natural Sciences	17.16	17.16	5.847**	0.912***
	Social sciences	16.53	16.53		
	Arts	15.80	15.80		
Peers	Natural Sciences	14.04	14.04	.071	
	Social Sciences	14.14	14.14		
	Arts	14.15	14.15		
Financial Reasons	Natural Sciences	9.49	9.49	2.637	

	Social Sciences	8.97	8.97	
	Arts	8.63	8.63	
Job Opportunity	Natural Sciences	12.07	12.07	1.769
	Social Sciences	12.32	12.32	
	Arts	11.83	11.83	

N = 200

$N_{natural\ science}$ = 57; $N_{social\ science}$ = 103; N_{arts} = 40

Notes. ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$ (multivariate analysis)

Based on Table 5, we can see the Wilk's lambda significance value ($p < 0.001$); thus, there was a significant difference of factors leading the three respondents group to their majors selection. Based on the multivariate analysis of external factors, there was only one of them influential on the selection of majors—quality of education ($p < 0.01$; M square = 5.847). Apart from this, there were three factors not significantly influencing the selection, which were peers ($p > 0.05$), financial reasons ($p > 0.05$), and job opportunity ($p > 0.05$). The quality of education significantly influenced students in selecting their university major, especially the ones who chose Natural Sciences (M = 17.16; SD 3.61) but was less influential on students who selected Arts (M = 15.80; SD = 2.47).

Table 6

Post-Hoc Test with LSD on External Factors

	Major Selection (I)	Major Selection (J)	Mean Difference (I-J)	Sig.
Quality of Education	Natural Sciences	Social Sciences	0.62	0.052
		Arts	1.36	0.001
	Social Sciences	Natural Sciences	-0.62	0.052
		Arts	0.73	0.043
	Arts	Natural Sciences	-1.36	0.001
		Social Sciences	-0.73	0.043

Based on the results of the LSD test, as presented in Table 6, among some external factors identified as influential on students' university major selections, the quality of education was the most significant for students who chose Natural Sciences and Arts (MD = 1.46). Based on Tables 5 and 6, it can be concluded that the research hypothesis is accepted, meaning that each external factor significantly and differently influences students in selecting their university majors (Natural Sciences, Social Sciences, and Arts).

Comparison between Internal and External Factors

Table 7

Student's Major Selection Based on Internal and External Factors

	Major Selection	M	SD	M Square	Wilk's Lambda
Internal	Natural Sciences	77.33	4.449	376.515***	0.860***
	Social sciences	73.10	6.560		
	Arts	76.33	5.677		
External	Natural Sciences	52.75	3.572	65.934*	
	Social sciences	51.96	4.921		
	Arts	50.40	2.228		

N = 200

$N_{natural sciences}$ = 57; $N_{social sciences}$ = 103; N_{arts} = 40.

Notes. ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$ (multivariate analysis)

Based on the multivariate analysis on internal and external factors, it was found that the internal factors ($p < 001$) and the external factors ($p < 05$) were both significantly influential on the selection of university majors. Internal factors were significantly influential, especially on students who selected Natural Sciences (M = 77.33; SD 4.449) but were less influential on students who chose Social Sciences (M = 73.10; SD = 6.560). External factors were significantly influential, especially on students who selected Natural Sciences (M = 52.75; SD 3.572) but were less influential on students who chose Arts (M = 50.40; SD 2.228).

Table 8

Post-Hoc Test on External Factors

	Major Selection (I)	Major Selection (J)	Mean Difference (I-J)	Sig.
Internal	Natural Sciences	Social Sciences	4.24	0.000
		Arts	1.01	0.405
	Social Sciences	Natural Sciences	-4.24*	0.000
		Arts	-3.23*	0.003
	Arts	Natural Sciences	-1.01	0.405
		Social Sciences	3.23*	0.003
External	Natural Sciences	Social Sciences	0.79	0.247
		Arts	2.35*	0.006
	Social Sciences	Natural Sciences	-0.79	0.247
		Arts	1.56*	0.044
	Arts	Natural Sciences	-2.35*	0.006
		Social Sciences	-1.56*	0.044

*Mean difference is significant if ($p < 0.05$)

Based on the results of the LSD test, as presented in Table 8, internal factors were more influential than external factors on students in deciding their university majors. Students who chose Natural Sciences tended to be influenced by internal factors, while students choosing Arts were

mostly motivated by external factors. Based on Tables 7 and 8, it can be concluded that the research hypothesis is accepted, meaning that internal factors were more influential than external factors on students in deciding their university majors.

Discussion, Conclusion and Implications

The selection of a university major is an important aspect of students' career development. Selecting a major according to interest and talent positively contributes to someone's success during university study and after graduating. In Indonesia, many students sit for the university entrance exam, but several of them face difficulties in deciding a major based on their interests. The selection of a university major is not only influenced by interest aspects but also by many other factors, such as family, gender, financial reasons, quality of education, academic achievement, peers, culture, and job opportunity. Factors influencing students in selecting their university majors are divided into internal and external (Lent et al., 2000). Internal factors include families, interest, culture, academic achievement, and gender, while external factors refer to the quality of education, peers, job opportunity, and financial constraints. This study aimed to investigate how internal and external factors influence the selection of a major, and how those factors are differently influential.

Internal Factors Influencing Students in Selecting University Majors

There were three internal factors influencing students, including families, academic achievement, and culture; however, gender did not any influence selection. Families were influential because the majority of values and beliefs of life are introduced by them. Therefore, it is one of the main considerations when Gen Z decide their university major. Anne Roe's contagion about the theory of needs and career choice postulates that interaction between parents and child affect their career choices (Adekeye et al., 2017). A relevant study from Bikse et al. (2018) found that only 5% UK youths agree that career guidance from parents is helpful on selecting a major, and only 1.6% of Latvian respondents stated that career guidance, particularly from professionals, is useful for selecting a major. Some earlier studies have also confirmed that parents affect students' career choices (Camarero-Figuerola et al., 2020; Fouad et al., 2016; Kazi & Akhlaq, 2017).

Academic achievement was very influential on students when selecting a university major, especially the ones who chose Natural Science programs. However, it was less influential on

students who decided to study Arts. It is because, in the Indonesian context, children with high academic scores are usually suggested to register for Natural Science programs by their parents and guidance and counselling teachers. Another internal factor influencing the selection of a university major was culture. Gen Z is highly influenced by their cultural identity (Parker, 2019), the environment, and the financial status of their parents (Griffin & Hu, 2019). Students living in the coastal area tend to work as seamen, fishers, at shipping related jobs, and sea product entrepreneurs. However, culture was more influential on students who selected Arts and less influential on those who chose Social Sciences. In fact, culture was one of the important factors considered by Gen Z when selecting their university major. This variable refers to values introduced and integrated by families, environments, and societies.

An interesting finding was that gender did not influence students in selecting their university major. It is because Gen Z students do not really consider the "masculinity" or "femininity" of a major, due to better gender awareness. Nowadays, there have been many successful role models in various sectors, unlike in the past, when the profession of a chef was dominated by women. Presently, there are more and more men becoming successful in this sector. Therefore, it can be concluded that Gen Z's awareness about gender equality is better than Gen Y. Additionally, Gen Z believes that there is no difference between male and female students in selecting a major for higher education (Watson-Canning, 2020; Yazici & Yazici, 2010), implying the absence of differences in major selections between two different genders.

External Factors Influencing Students in Selecting University Majors

There are four external factors influencing students in selecting a university major—quality of education, peers, financial reasons, and job opportunity. Based on the findings describing how external factors influence students in selecting their university major, only the quality of education was significantly influential, especially for the ones choosing Natural Sciences. It is because these students tended to have high academic scores, so that they could enter a high-quality major with competitive admission selection. Quality of education also had a significant influence on the students' career selection. Quality of education here refers to the prestige of a university major. Studies conducted by Phillips et al. (2019), Yazici and Yazici (2010) showed that it becomes an important aspect in major selection because it is positively correlated with the students' future prosperity, the amount of salary they will earn at work, and whether societies favor the major.

On the other hand, some factors identified as not influential on the selection of a major included peers, financial backing, and job opportunity. Based on an earlier finding, peers do not influence students in deciding a university major because Gen Z tend to be more explorative (Renfro, 2012), so that they can decide the university major to apply on their own. In terms of job opportunity, the related study from Kazi and Akhlaq (2017) pointed out that other factors influencing career choice, such as are future job opportunities and job outcomes, have a weak relationships with students in selecting a major. It is because Gen Z do not consider job opportunities in choosing a career. Instead, they choose a career that they like, does not bind them, and provides freedom (Bencsik et al., 2016).

Comparison Between Internal and External Factors

Gen Z were more influenced by internal rather than external factors in deciding their university major. This is because Gen Z tend to choose careers more independently, and highly rely on the Internet. Therefore, in choosing a major, they tend to explore the data by themselves, without seeking assistance from their friends or others. It is supported by the availability of various career information accessible online. Also, they feel free to explore interesting majors when applying to a university (Trice & Greer, 2016). Consequently, this independent exploration influences how Gen Z see their future, including the major they take up in university.

Another finding was that students who chose Natural Sciences tended to be influenced by internal factors, while students choosing Arts were generally influenced by external factors. Holmegaard et al. (2014) explained that it is because students who choose Natural Sciences believe that they can solve a problem through constructing definitions, choosing methods, withdrawing conclusions, and formulating new ideas by themselves, without influence from others. Thus, students who select the Natural Sciences enjoy solving problems internally, as compared to students who choosing Arts, who prefer to solve a problem via exploration through discussions and collaborations with other people to figure out novel perspectives that can be continuously developed (Xing-ping & Chu-jun, 2007). All in all, Gen Z who select Arts tend to solve problems externally.

Implications

Based on the findings, this study has some implications on the roles of counselling teachers in guiding students in selecting their career. Teachers should consider some internal factors related

to Gen Z, such as academic achievement, and external factors, such as the quality of education, in assisting students to selecting a university major tailored to those who plan to study Natural Sciences. Furthermore, counseling teachers should be concerned about internal factors, such as families and culture, in guiding students with an interest in the Arts to selecting a university major tailored to them.

Conclusion

At the end of this study, it can be concluded that factors influencing Gen Z in selecting a university major consist of external and internal factors. Internal factors include families, academic achievement, and culture, while external factors refer to the quality of education. Although both groups of factors are influential on students in deciding their university majors, internal factors dominate. Family influence and culture are very influential on students who decided to study Arts, while students selecting Natural Sciences are generally influenced by their prior academic achievements. The difference emerges due to the different ways that Gen Z apply themselves to solving a problem. In this case, Gen Z who select the Arts prefer to solve problems externally, while those who choose Natural Sciences generally solve problems internally.

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