



Identify the Reasons of Students' Choices for Majors and Courses

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Abstract. The future careers of students aged 15 to 24 are more or less affected by the school's course settings and majors, and students often have such problems that they have to choose some courses or majors. As a result, this phenomenon often comes up with gender inequality, which leads to occupational segregation. This study explored the reasons for students' choices of majors and courses. This research can help scholars better understand the considerations for students choosing majors and courses. This article analyzed 27 articles selected from Google Scholar. In a conclusion, the study found that different countries have different courses and majors to let students separate from each other by gender. Furthermore, students themselves will choose different courses or majors because of some personal factors and environmental factors like levels of competence, self-efficacy, students' vocational interests, and family reasons.

Keywords: Occupational segregation · Gender · Course settings · Majors · Choice

1 Introduction

High school and university are key stages for students aged 15 to 24 to develop their capacity, interests, and needs associated with self-concepts, narrow and make their career choices [1]. Internationally, students of different gender hold various considerations when they choose their courses and majors in high school and universities. Appropriate choice of courses and majors helped students cultivate the required skills and abilities that students used for their future careers, which influenced students' future career choices. However, there existed some schools that try to cultivate girls and boys with their corresponding characteristics for gender-appropriate careers through their major and course settings, based on some updated or stereotyped studies about gender differences in abilities. For instance, some previous studies pointed out some psychological factors, such as gender differences in risk-taking, competitive ambition and negotiating

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ability, influencing occupational segregation by gender [2]. Regarding some updated studies, Kamas and Preston propose that boys perform only slightly better than girls when calculating maths problems, and when achieving the verbal task, boys and girls showed similar levels of performance [3]. This promoted occupational segregation by gender, which emphasized various distribution of occupations of males and females based on their biological sexes [2].

Because the gender factors caused by the historical social trend will imperceptibly affect people's thoughts, contemporary educational models and career choices for both gender are often based on certain historical contexts.

Since the 20th century, the scientific and technological progress and ideological progress brought about by the development of the times have shaken people's minds about occupational segregation to some extent, which intertwined mind liberation with social feudalism. And with the improvement and reforming of course settings and majors, people had more choices and more considerations about it. Unfortunately, although people in the new era strive to break occupational segregation by gender during making career choices, most of them had to submit to the status quo. Fu stated that education in the early modern period was still based on gender differences, aiming to train women to be good wives and mothers [4]. And it is mentioned by Jiang and Li that after the two world wars, women finally entered all walks of life [5]. Despite this, women's social attributes required them to balance family and work, and people were not optimistic about women engaging in some logical and creative careers. Li also mentioned that in contemporary American vocational education, women are considered more suitable for secretarial work [6].

After the 21st century, the boundaries of occupational segregation are gradually blurring. The right to choose a career is gradually handed over to people, mass thought is becoming more and more mature, and people are no longer swayed by social trends. Gao mentioned that some men who were willing to engage in non-traditional occupations would inevitably have conflicts with their families [7]. However, the gender division of labour has presented a new situation. The large number of men entering women's occupations has the same profound significance as women entering men's work fields in the early days. Both are typical issues of gender equality.

This paper aimed to identify various considerations that students take when they make courses and major choices at high school and universities.

Identifying students' considerations regarding their course and major choices enrich scholars' understanding of whether students have a vision and plan for their future career at this stage, whether they have a more comprehensive self-concept and assessment of their ability to perform the career they want to pursue. Scholars can also figure out some external factors that influence students' choice of courses, majors and future employment. This contributed to the future improvement of courses and major settings, thus avoiding the promotion of occupational segregation by gender.

The course contents and genres that schools provide to students are different in different countries and at different stages of education. Therefore, in the main body part, this paper will explain these aspects from high schools and universities in different countries.

The research on the course and major choice in the past 20 to 30 years is relatively comprehensive and detailed. Research on course contents and genres is generally conducted on a country-by-country basis. Research on major choice is generally based on students' self-efficacy, students' career interests and family influence.

The research on course contents and genres basically explains from the course setting, the influence of the specific courses set by different types of schools on the future career choices of different genders. The research of the major choice part, more concretely explains the students' choices from the subjective aspect.

In order to fill in this research gap, this review integrated the research results and review achievements done by previous studies related to the course and major settings in high schools and universities. Then, this review analyzed 27 studies that explored courses and major contents and genres in global high schools and universities, students' choices for their majors and courses, and focused on students' considerations regarding choosing their courses and majors. Finally summarized the conclusion of this review and then pointed out the potential improvement for future studies. All the studies mentioned in this review were found using academic searching platforms such as Google Scholar.

2 Students' Courses and Choices with Considerations

In total, this review analyzed 27 studies that related to the course and major settings in global high schools and universities. Among these 27 studies, 11 of them briefly introduced the content and genres of courses and majors provided by global high schools and universities. This paper also analyzed 3 of these studies that explored the situations of students' courses and major choices in global high schools and universities. By comparing and contrasting 13 of these 27 studies, this review mainly focused on different considerations that students regarded when they take courses and major choices, which potentially promote occupational segregation by gender. All these 27 studies are assembled in Table 1.

2.1 Content and Genres of Courses and Majors

2.1.1 Chinese Course Contents and Genres

There are ordinary high schools and vocational high schools in Chinese high schools. These different types of high schools have different types of course content and genres for students.

Table 1. Analysis of 27 papers related to the course and major settings

Number of Papers	Course and Major Settings	References
11	Contents and Genres of Courses and Majors	[8–18]
3	Situations of Course and Major Choices	[19–21]
13	Considerations When Choosing Courses and Majors	[22–34]

Now, under the reform of the new college entrance examination system, students have more choices. Although ordinary high schools emphasize the autonomy of students, there are large deviations in the choice of courses and the choice of future prospects [8]. In the Chinese curriculum, China adopts an integrated, practice-oriented view of academic achievement, dividing quality levels according to graduation orientation [9].

The vocational high schools focus on training workers and practitioners with intermediate vocational abilities. In this way, students in vocational high schools are exposed to the learning of specific occupations in the future. The courses in vocational high schools are mostly computer engineering, accounting, nursing, and flight attendants, and the educational ideas conveyed in different courses are also different.

Chinese universities have been reforming their course contents and genres in recent years. In recent years, with the advancement of the popularization of higher education in China, amid the clamour of education marketization, utilitarianism and pragmatism, many well-known domestic colleges and universities have opened various commercial female courses in the name of cultivating female charm [10].

2.1.2 US Course Contents and Genres

Attention is directed to the core curriculum, which consist of courses in English, literature, the arts, foreign language, history, civics, science, mathematics, technology, and health [11]. For example, the PCCAPS Curriculum in Utah is based on the core curricula [12]. In addition, Ohio has constructed the “Career Connection Framework” to help schools and teachers to reform curricula and instruction. For example, the lessons of a class revolve around the ocean and different subjects are taught according to this theme [13].

Some boys' high schools in the United States have different educational goals from girls' schools. Boys' high school focus more on cultivating independent leadership skills. Therefore, the educational goal of their schools is to make students become more capable and attractive men. Aspects will also focus on the characteristics of men's thinking, and set up some targeted courses accordingly. The goal of some girls' schools is to cultivate communication skills that are different from men's leadership skills. In teaching, they will pay more attention to the physical and psychological development of girls, and offer courses that are in line with women's own temperament [8].

Female students felt a stronger sense of community and perceived lower levels of performance-approach goal structure in online classes than their male counterparts experienced. Male students perceived the face-to-face classes as being more communal and less performance-approach oriented than the females did [14].

2.1.3 British Course Contents and Genres

In as much as girls continue to be under-represented in technology courses, they have not benefited from the comparatively large financial investments in technology [15].

Modularization of courses has introduced an element of flexibility, which has meant that students can choose different routes through a course by studying different combinations of modules [16].

2.1.4 Japanese Course Contents and Genres

Japanese courses in high school are full of diversity. Every school in Japan designs a variety of courses called “course packages” for students. These programs combine common foundation subjects with various elective subjects according to different requirements for further studies or employment [17]. Different from other countries’ high school courses, home economics class in Japanese high school has changed from a girls’ course to a compulsory course for both boys and girls [18].

2.1.5 General Trend of High School Course Choice and University Major Choice

Summarized from previous studies, there appeared a general trend that people of both genders still preferred to choose the courses or major that implied the gender directed career. In other words, female students preferred to choose art courses or arts-related majors, while male students preferred to choose science-related courses and majors such as STEM. This influenced their gender-directed career decision, thus promoting occupational segregation by gender. Among over 44000 K-12 High school students in Canada, female students with an average GPA have less probability with a lower odd ratio of 0.739, to choose Math courses than male students [19]. Even regarding the science-related courses choices, female students have less probability of 0.068 to choose the Physical science courses than male students with a probability of 0.205 [19]. Furthermore, in a high school in North Carolina with 1066 students, 59% of white female students and only 29.6% of white male students, 7.6% of black female students and 3.8% of black male students choose the Foreign Language Honor and AP advanced courses [20]. Connecting to the major choices in specialized liberal arts and science universities in China, 62.4% of female students among 6753 students chose social science majors, 77.3% of male students and 22.7% of female students among 4116 students chose engineering majors [21]. Hence, more male students were encouraged to choose practical STEM majors, while female students were still encouraged to choose majors related to arts. Students’ major and course choice influenced their gender-directed career decision, thus promoting occupational segregation by gender.

2.2 Students’ Considerations Regarding Making Courses and Majors Choices

Students will take some considerations into account when they decided on the course and major choices of students. Gallioth and Graham proposed four evaluative elements that strengthen students’ career choice capability, including personal resources, educational resources, and current functioning in terms of subjective measures and objective measures [22]. Firstly, personal resources involved career role models, parents’ occupation, and family support, educational resources contained subject choice and career education classes. Students’ current functioning in terms of their capabilities to engage in jobs includes the objective that measures students’ self-efficacy, their knowledge of their career, and their satisfaction with their career goals. It also comprised objective measures, including students’ academic achievement, career-related experience, and their access and usage of career information.

2.2.1 Students of Different Genders Have Various Levels of Competence and Self-efficacy

Analyzing some of these elements that are regarded by students as their considerations in career determination, firstly, students will consider whether they have the competence and self-efficacy for mastering the professional courses as the basis for them to engage in corresponding careers. Driven by gender courses, female and male students have less self-efficacy to believe that they have the competence to engage the careers that are not gender-directed. Some male undergraduates who consider choosing a nursing major, even some male nurses, doubt their nursing competence because they believed in the stereotyped that boys are not excelled at caring and use discursive language as female discourses [23, 24]. Also supported by Pinson et al. when conducting their research in an Arabic high school, although some girls enjoyed and specialized in science, they may still not choose a career related to science driven by their stereotyped view of masculine scientists [25]. Furthermore, to equip all students with or improve students' spatial abilities, helping them engage in STEM occupations in the future, some Caribbean secondary schools offer technical drawing (TD) subjects and launch a series of interesting activities, including formally playing games related to "science, technological, engineering and mathematics" (STEM) [26]. Regarding the lateralization theory evidenced by Capraro, the right hemisphere of the boys' brain matures faster than girls helping boys develop their special performance advance [27]. Based on this theory, although students of all gender are taught these kinds of activities to improve their spatial ability, teachers usually exploit teaching methods related to cultivating spatial ability in ways that are more suitable for male students to comprehend and acquire [26]. This reflects that in the existing educational environment that rapidly develops boys' spatial abilities in this area, once male students acquire the knowledge and spacial skills quicker and better than female students, these male students may become more competitive and advantageous to make their career choices and go for a position related to STEM subjects in the future. Besides, Argyropoulou et al. discovered that there appeared a negative correlation between career indecision and self-efficacy that the less self-efficacy the students will have, the more career indecision the students will make [28]. More importantly, nearly 31.5% of 842 Greek high school students have underdevelopment of necessary personality characteristics and skills required for the careers that they were interested in [28]. They have difficulties achieving vocational development tasks, due to their lack of accepting courses to cultivate their career-required abilities [28].

2.2.2 Students' Vocational Interests

In addition, vocational interests will also affect the course choices and major choices of male and female students to a certain extent. According to Hollander's theory of vocational interests, personal characteristics and interests can be classified into realistic (R), investigative (I), artistic (A), social (S), enterprising (E), and conventional (C) six categories. And research conveyed by Xu et al. took 875 college students from 56 majors in Nanjing University of Technology as the research object, took vocational interest and major interest matching as the main variables, and conducted a questionnaire survey on these students [29]. The result showed that there were significant differences in career

interests, as well as significant gender differences in vocational choice. Most of the boys chose enterprising majors, while the choices of girls were more balanced among conventional, artistic and enterprising majors. At the same time, it is found that female college students take personal career interests more into consideration when choosing majors, while male college students are more influenced by social factors rather than personal interests like social status or income.

The types of people's vocational interests are various and seldom focus on one particular type. The results of the survey more reflect the preferences and trends of people's vocational interests.

2.2.3 Herd Mentality and Family Influence of Both Gender: Engaging in a “Decent Job”

Under their parents' and family's influence, students have the herd mentality to choose the major and courses corresponding to their gender directed careers that are regarded as decent and stable jobs, which are chosen by their peers or engaged by their families. For instance, Some male students choose electrical engineering courses since all their male friends choose these courses [24]. Regarding the family influence, parents' occupations have potential impacts on children's career choices about whether engage in the same profession as their parents or not. Regarding Chinese university teachers who chose an education major and engaged in 56 different Chinese universities, 26.5% of their fathers engaged in academic careers such as teaching and law [30]. Some parents may provide the opportunity or encourage their children to have vocational experiences, and provide suggestions to choose practical courses and corresponding majors, thus helping their children better engage in their future careers. For instance, before they enter universities and choose nursing as their major, some female high school students have already experienced health care training [24].

The motivation of engaging in a decent or lucrative job also attracted students' attention when making courses and major choices. For example, most medical students of both genders emphasize their utilitarian pursuit to choose medical majors in universities and engage in medical occupations in the future [31]. Even tracing back to the late nineteenth and twentieth centuries, females were gradually respected to become teachers for girls since teaching is regarded as a decent job for women with more and more working opportunities provided for girls in England and France [32, 33]. Moreover, students who grew up in rural areas choose the major and courses that help them engage in a “decent” job to make a living [24]. When analyzing the background of 228 Nigeria students in rural areas when they make course choices, approximately 60.5% of their parents were farmers, 66.7% of them have average and low knowledge about agriculture, and 64.7% of them visited commercial farms for 1 to 4 times per year [34]. With adequate recourses, knowledge, and practical experiences regarding their future career such as agriculture, those students blindly choose agriculture science courses and desired to engage in agriculture and maintain lives.

3 Conclusion

This paper aimed to identify various considerations that students take when they make courses and major choices at high school and universities. Based on the literature review on this subject, the study can draw the following conclusions:

From the past to the present, occupational segregation caused by gender discrimination will affect people's careers to some degree and stereotypes are hard to dispel. In today's world, based on the educational policies of different countries, different course settings of different high schools and universities and different majors of universities reflect gender inequality to a certain extent.

From previous research, the study found that students' personal factors including human capability, self-efficacy, competence, vocational interests and social environment factors including family influence, social trends, living areas and so on will affect students' choice of high school courses and university majors and affect their career choices shortly. However, these phenomena are difficult to get rid of gender discrimination. However, students should realize that the setting of majors and courses, and the choice of majors and courses are not dependent on gender, but dependent on whether individuals are competent.

For future analysis of students' considerations when they make major and course choices, scholars should first conduct a literature review to analyze and compare the gender-specific considerations of students in various countries when they faced major and courses choices in recent years. They should figure out whether global students in genders have the same or different considerations when they make major and course choices. They should also consider whether these considerations are driven by their gender identity or stereotypes regarding gender roles. Then, they should analyze the impact of these considerations on students' real career choices and how it contributes to the phenomenon of occupational segregation by gender.

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