

Received: 26 March 2020; **Revised:** 03 April 2020; **Accepted:** 04 April 2020; **Published:** 10 June 2020
Researchpedia Journal of Computing, Volume 1, Issue 1, Article 4, Pages 30-38, June 2020

Digital Object Identifier RpJCS.2020.101.DONumber

A Review of Career Selection Models

Farah Haneef¹, Rabeeh Ayaz Abbasi¹, Muhammad Nouman Noor², Ali Daud³, and Muddassar Azam Sindhu¹

¹Department of Computer Science, Quaid-i-Azam University, Islamabad, Pakistan

² Department of Computer Science, HITEC University, Taxila, Pakistan

³ Department of Information Systems and Technology, College of Computer Science and Engineering, University of Jeddah, Jeddah, Saudi Arabia

Corresponding author: Rabeeh Ayaz Abbasi (e-mail: rabeeh.abbasi@gmail.com).

ABSTRACT Career selection plays an important role in every industry. It has immense influence on individuals' futures. Due to its importance, many researchers have proposed models and guidelines for career selection to help people select careers systematically. This article discusses various career selection models and guidelines. It elaborates the elements and factors that contribute to the career selection process and classifies them according to specific professions. It also highlights the limitations of existing models and suggests solutions and directions for future work. As the studies discussed in this article were conducted in various countries, the findings provide an international perspective that includes implications for the Arab world, China and Europe.

Keywords Career counselling, career selection, career switching, influencing factors of career selection.

I. INTRODUCTION

Education makes us capable of analyzing the positivity and negativity of our actions and makes us level-headed and responsible. For this reason, students are a worthy asset for any society. To make them productive and vigorous, it is essential to analyze their abilities and channel their talents positively. In developed countries, career counselling services are an integral part of institutions. According to [29], the first career counselling service was established in the United States in the 1950s, in the UK in the 1960s and in China in the 1990s [41]. However, many developing countries lack proper infrastructure and expertise in career counselling services [28]. Among the many limitations of educational systems in developing countries, lack of career counselling services is significant [29] as it may increase nations' unemployment rates [41].

Proper career selection is one of the most important decisions in a student's life, and it has significant influence on his or her future [41][20]. Researchers have proposed guidelines for students undertaking career selection [20][21][33] and have tested various factors for career selection [1][2][3][6][7][10][11][16][31][37] [42][50].

In developed countries, students are provided guidance benefiting from research. Mentors are hired especially for this purpose [29] and are responsible for judging the interests and abilities of young people and guiding them in career selection. Many researchers have proposed career development and counselling models to guide students and counsellors in appropriate career selection and counselling, respectively [6][7][11][9][20][22][38].

In the last few decades, much research has been done on appropriate career selection and career counselling, but most researchers have focused on the factors that are significant in the career selection process. There are only a few review articles for career selection frameworks, and most of them focus on individual career resources and career management [4][17][24][25][26][39].

The purpose of this research is to examine and explore the existing literature regarding career selection with respect to guidelines, frameworks and influential factors and provide significant guidance to young people in appropriate career selection. In this review, we have selected articles conducted in various countries to make our findings significant to an international perspective, including implications for the Arab world, China and Europe. We have covered the evolution of career selection models, their elements, characteristics, datasets and limitations, as well as suggestions to overcome these limitations.

The main contributions of this paper are given below:

- Discussion of techniques and practices for counseling purposes.

- Summarization of career selection models.
- Identification of limitations of existing career selection models.

A. METHODS FOR SELECTING PAPERS

1) SELECTION STRATEGY

Keeping the research objectives in mind, we selected relevant papers based on the following criteria:

- We included articles that are relevant to career selection models and frameworks.
- We included articles related to factors of the career selection process. These factors may be generalized to all professions or can be related to a specific profession like nursing, gaming or social relations.
- We also included articles that describe the step-by-step procedures for career selection.

2) REJECTION CRITERIA

We excluded all those studies that did not provide guidelines for the career selection process in the form of step-by-step procedures or factors or in the form of models. As during the literature review, we found studies that described the successes and failures of professional life but did not provide guidelines that could meet our objectives; therefore, we excluded such studies.

3) QUALITY CRITERIA

To ensure the quality of the included papers, we considered only those frameworks that described their data sets and/or evaluation criteria. We ensured that papers describing step-by-step guidelines for career selection and giving factors for career selection provided statistics to support their analysis and evaluation.

4) DATA SOURCES

We acquired appropriate papers from the following data sources:

- ACM Digital Library
- IEEE Xplore
- Springer Link
- Science Direct
- Google Scholar

5) SEARCH QUERIES

To meet our research objective, we used search queries for each data source by considering main concepts and their synonyms. The chosen search queries were as follows: career selection guidance, career selection models, influencing factors in career selection process, step-by-step procedures for career counselling.

B. OTHER RECOMMENDATIONS

In this review, 25 research studies were selected with the goal of identifying influencing factors and discussing career selection models. Seven of these studies are based on interpretive research [3][6][7][11][21][23][33]. Eight studies use qualitative as well as quantitative methods, using questionnaires with questions based on short answers and others on the Likert scale [1][2][16][31][42][50]. Nine studies are qualitative [6][9][10][13][20][21][22][29][49], and one is purely quantitative [37].

An analysis of these research studies in the form of contributions reveals that, in eleven studies, different influencing factors have been discussed for appropriate career selection. One article focuses on the relevancy of subjects studied and future interests. Three articles provide step-by-step procedures for appropriate career selection. One article focuses on the problems of the education system of a developing country. Two research articles analyse the importance of mentors' and parents' behaviour and described theories regarding appropriate career selection. Two research articles mainly focus on counsellors' training, whereas three articles are relevant to the preparation of students for self-counselling.

This study discusses various models for career selection, describes their purposes and limitations and suggests future directions. In particular, it investigates the following research questions:

RQ1: Which factors impact the career selection process?

RQ2: Which steps are helpful in appropriate career selection?

RQ3: Which models exist for suggesting careers?

C. CONCEPTS AND TERMINOLOGIES

In this section, we provide and explain some basic terminologies used in career selection models:

1) CAREER

Traditionally, a career is considered an occupation or profession that is adopted for a significant period of someone's life and provides him or her opportunities for progress and prosperity. Usually, a career includes all the roles of one's life, such as education, training and paid and unpaid work.

2) MENTOR

A mentor or counselor is a person with experience, keen observational skills, critical analysis ability and trusted advising ability.

3) CAREER COUNSELLING

Career counselling is a process that enables people to analyse and understand themselves and the world of careers and professions to allow us to make the best decisions about their educational and professional careers.

4) SELF-COUNSELLING

Self-counselling is a process of self-examination through which a person judges his own behavior and temperament and tries to make appropriate decisions in life.

5) INTERPRETIVE RESEARCH

This is a research method that includes the human element. As it depends on how researchers interpret the information assimilated through a study, this type of research is based on meanings and understanding.

6) INFLUENCING FACTORS OF CAREER SELECTION

Influencing factors are those elements and aspects that affect the career selection process. Their effects can be positive or negative.

II. IMPORTANCE OF CAREER COUNSELLING

For career selection, it is important to have career counselling services starting as early as the matriculation level [29]. Though such services are an integral part of educational institutions in developed countries, many developing countries suffer from a lack of such services, especially at public institutions. To find and analyse the problems of public schools in a developing country, a study was conducted by [29] that interviewed students of a public high school and found that the students were not satisfied with the existing system.

Career counselling services heavily depend upon the abilities of counsellors and mentors. The importance of counsellors as well as counsellors' professional training for proper career counselling of students is elaborated in [9]. Authors describe that it is essential for a counsellor to make tentative interpretations about the future careers of students by watching and analysing their interests and abilities. At a more formal level, a model for counsellors' professional training is proposed in [22]. The proposed model can be implemented through professional development of counsellors and their involvement with teachers and managerial activities.

In addition to formal counselling services, training students for self-counselling bear fruitful results. Various researchers have proposed models for self-counselling for high school students. Gysbers and Henderson suggest classroom and group activities through which students can be prepared for true counselling [22]. They describe four components in their model: curriculum guidance, individual planning, responsive services and system support. Guidance curriculum is derived through classroom activities and group activities for grade 12 students. Individual planning is achieved through the one-to-one interactions of students and counsellors. This helps in analysing the interests and difficulties of students and prepares them for positive future decisions. Other researchers have also proposed models like the four Qs model for self-counselling, particularly for specific domains like medicine [38].

Authors of [44] discussed an expert career counselling system which is based on Artificial Intelligence. Four main components of this system are Knowledge Base, Database/Working memory, Inference Engine and User Interface. Paper claimed that the expert system proved to be successful in education sector of India.

Study on influence of using expert system in student career and guidance distributes the expert system into two categories: (1) Expert systems that guide students for education (2) Expert systems that guide students for job career [18].

Student interest is vital in selecting an appropriate career. In fact, students' learning and performance improves when they study courses relevant to their interests [49]. Authors evaluate career impacts and the middle grades of major subjects like mathematics, science, language and the arts to analyse student performance. The Career Start program was introduced in fourteen different schools in various districts in the United States of America in the academic year 2006-2007. There were 3,295 students, and the analysis period spanned three years. After analysis of students' grades in major subjects, the authors concluded that performance improved when studied subjects matched future interests.

Teachers play an important role in students' career development. In [13], authors describe the relationship between teachers' credentials and students' performance. The authors use an administrative dataset from North Carolina and claim that teachers' behaviour and their credentials act as important factors in student performance. They conclude that teachers' experience, exploration of students' interests, test scores and regular licensure positively affect student performance. Other factors like qualification of teachers, their behaviour, emotions of students and support by teachers and parents can also play an important role in suggesting careers [23]. Kern describes that these problems are faced by students due to lack of attention and lack of interest in students' career from their parents and teachers. The author proposes various approaches to overcome these problems, including positive support, loyalty of intercession, mentoring and relationship-building. They claim that these approaches can make students ambitious as well as make their lives peaceful and progressive.

Career counselling can be made more effective if counsellors, teachers, parents and students interact with each other. A model based on responsive services for developing relationships between counsellors, parents and students is proposed in [22]. Responsive services are derived through proper consultation and advisory meetings between counsellors and parents and teachers.

In this paper, we have organised the study in the form of the taxonomy shown in Figure 1. This taxonomy describes the three important concepts of career selection: factors, guides and models.

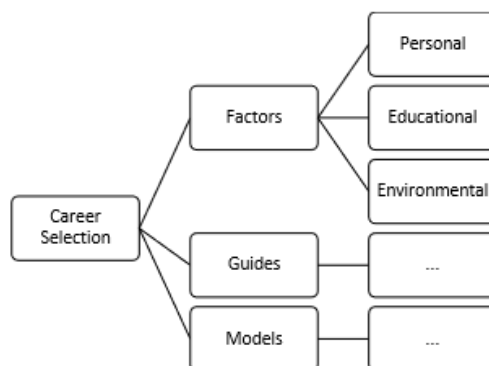


FIGURE 1. Taxonomy of Career Selection

III. FACTORS IMPACTING CAREER SELECTION

Many factors impact career selection. Bedford suggests that focus, information, realism, scope and tactics are important instruments for appropriate career selection and constructive career counselling [7]. Sullivan describes three factors affecting career selection: how much education someone must attain, which profession he or she should join and when someone should switch companies. He illustrates the relationship between these three factors and proposes a model that combines professional and educational choices [42]. To build the model, he collected data from 12,686 people between 14 and 22 years old and collected complete information about their education and employment. To analyse the results, he used the parameters of Berkovec and Stern's job search model [8]. Based on the results [42], authors concludes that, depending on one's choices, profession selection and firm switching are more important determinants of total earning than the collective effects of firm- and profession-specific earnings.

In [1] authors describe the factors that contribute to career choices for graduates. They consider five professions (management, medical, engineering, pharmacy and agriculture) to test various factors regarding those professions. Data was collected through a questionnaire comprising 24 items distributed across five factors: growth opportunities (further studies, further training), occupational charm (secure job, fringe benefits, starting salary), self-esteem (life style, prestige, respect), societal inspiration (parents' influence, friends' influence, siblings' influence, teachers' influence) and work (autonomy of work, work load, flexible work). Their sample consisted of 370 students from eight different universities. They conclude that results vary significantly for the fields of medicine, management, and pharmacy. Similarly, societal inspiration affects females more than males.

Adamic and Filiz analyse the effects of parents' professions on their children's career selections based on 5.6 million pairs of parent-child relationships on Facebook [3]. They study whether children belonging to a family adopt the same professions as their parents or siblings. To analyse the effect of parents' professions on their children's career selection process, data from different professionals was collected through Facebook. English-speakers who mentioned their professions as well as relationships with their siblings or parents were considered. Based on the analysis of mother-daughter and father-son relations, the authors claim that gender does not affect the career selection process for children. The authors conclude that the probability of a relationship between parents' professions and their children's professions is not high, which shows that parents' professions do not usually affect their children's career selections. At the same time, the authors claim that twins may adopt the same professions with a probability of 0.25.

In [37], authors study the effects of parents' professions, personal choice and mass media in the career selection process of students. The authors analyse these three factors for Pakistan. The study sample consisted of 444 students between the ages of 18 and 26 and belonging to one of three different business schools. All three factors were found to have affected career selection. The authors conclude that two factors, media and students' personal choice, have more impact on profession selection than do parents' professions.

Blau in [10] studies career commitment prediction and measurement based on data from 119 nurses registered in an urban hospital. The author proposes a Nomo-logical network of career commitment and tests discriminant soundness of a measure,

which is useful for comparing career commitment with organisational commitment and job involvement. The author further examines the relationship of career commitment, organisational commitment and job involvement with different types of switching factors and claims that commitment and specific situational and individual differences are important for career prediction. In [31], authors also describe factors that affect the selection of nursing as a career. Their study sample consisted of 82 (70 females and 12 males) nursing students and their parents. Authors conclude that, in the parents' view, the factors of respect (academic staff) and job guarantee are important, whereas, for students, security in nursing schools and sufficient pay are important factors.

In [6], authors describe the factors that are important for the selection of sport as a profession. The authors suggest that prior probability of being talented, training costs and expected earnings are three basic factors that should be considered while adopting sport as a profession.

Xavier et al. in [50] discuss the factors that influence career choice and course selection activities for post-graduate students in public relations. They describe that undergraduate students' expectations are more different from courses and careers in public relations than are post-graduate students. That is why publicity and promotion training rather than business management is favoured for under graduate students. Students' thinking about careers is different, and the gap between reality and perception becomes a reason for dissatisfaction with career. The authors conclude that, in contrast to undergraduate students, post-graduate students better realise the actualities of a career, which is the reason they give preference to event management and publicity.

In [16], author discusses factors that can influence students' career selection process. He particularly focuses on the factors that affect career selection in the field of agriculture. According to him, parents, religious affairs, coaches and students' favourite personality affect career selection. He claims that school size or farming background do not necessarily influence choosing agriculture as a profession, but students with farming backgrounds usually take more interest in working in production agriculture based on the data of 128 students of agriculture at University of Tennessee (Martin). In his study, he considers the following factors: interest in the field, academic ability and aptitude, white collar vs. blue collar, personality, influential people, family business and economic stability, gender, race and outside factors. After in-depth analysis of these factors, he concludes that family background is the highest influencing factor, followed by personal choice and family business. As the participants of this study are students of agriculture, the results of this study may not be generalised to other fields.

In Table 1, factors studied by various researchers are listed. We can observe that the factors vary from profession to profession. However, a few factors, like personal choice and parents'/family's profession/business are commonly observed in different studies; hence, they play an important role in career selection.

TABLE I. Influencing Factors in Career Selection

Reference	Factors	Profession
[1]	Growth, charm, self-esteem, inspiration, work related	
[3]	Parents' professions	
[6]	Talent, training cost, expected earnings	Sport
[7]	Focus, information, realism, scope, tactics	
[10]	Commitment	Nursing
[16]	Family background, personal choice, family business	Agriculture
[27]	Salaries, parents' hopes and expectations, views and opinions of others, geographical location	
[31]	Job security	Nursing
[37]	Parents' professions, personal choice, mass media	Business
[40]	Professional security, personal background	Medical
[42]	Level of education, personal choice	
[45]	Personal interest, family background, location and industry (geographical and economics factors)	
[50]	Personal interest	Public relations

IV. GUIDES FOR CAREER SELECTION

Career selection guidelines may save time and effort for people seeking careers. Many researchers have proposed such guidelines. For example, O'Sullivan proposes a structural guide for career selection with focus on a step-by-step procedure to select a career [33]. He describes seven steps for career selection: making a list of goals and ambitions, exploring factors that

can affect career, selecting alternatives, assembling facts about each career, listing advantages and disadvantages of desired and alternative fields, choosing a career and, finally, planning to achieve aims. The author provides comprehensive guidance, stressing that, although these steps are simple and people can follow them on their own to select appropriate careers, if these steps are followed in the presence of a mentor who knows about a person's interests, then the efficiency of these lesson will be improved. This is because a mentor can advise a student about the advantages and disadvantages of desired and alternative professions.

In [20], authors describe two important steps for proper career selection: designing procedures for making career decisions and finding possible choices among alternatives along the developmental and evolutionary continuum. Gikopoulou in [21] describes multiple career guidance theories. One of them is Frank Parsons' talent matching theory. According to this theory, there are three steps for appropriate career selection: understanding of personal abilities and interests, gaining information regarding jobs and the labor market and judging the relationship between personal abilities and jobs. According to Parsons, when people perform jobs that match their interests and abilities, their performance and productivity increases.

Rodger in [35] proposes another theory for career selection, the seven points plan. In this theory, he describes seven attributes that must be assessed regarding different jobs and then relates them to career selection: physical characteristics, attainments, general intelligence, specialized aptitude, interests, disposition and circumstances. He emphasizes that one should join a profession only when the specific profession is relevant to his personality and interests.

From the guidelines mentioned in this section, we can observe that researchers possess diverse views regarding the most suitable guidelines for career selection. The common aspects of these guidelines are outlined below:

- Identifying personal interests and goals
- Identifying alternatives
- Exploring jobs
- Choosing a career

V. MODELS FOR CAREER SELECTION

Although many people make career choices, a lot of people face difficulties in this area [5][32][35][46]. It is also common for many individuals to change their careers at different stages of their lives [12][19][43]. Therefore, to guide people, several approaches exist in the literature. Existing models in literature about career development and counseling are summarized in Table 2.

TABLE II. Summary of Career Selection Models

Reference	Elements	Purpose	Limitations
[6]	Priori probability of being talented, training costs, expected earnings	Guidance for students studying sport	Limited audience
[9]	Counsellor, vocational abilities and interests of students, tentative interpretations for students' future careers, counselling sessions	Appropriate career selection	Suitable for limited audience, lack of supporting data
[11]	Person, contextual and experimental factors	Appropriate career selection	Limited description of model
[14]	Career adaptability, calling on career, career competencies	Appropriate career selection and management	Limited sample size
[15]	Age, gender, field of study, residence	Explore calling in career	Limited sample size
[20]	Designing procedures for making career decisions, choices among alternatives along with the developmental continuum	Making adequate career choices	Influencing factors not discussed, guidance at abstract level
[22]	Guidance curriculum, individual planning, responsive services, system support	Provide guidance through classroom activities, help students in their decisions, provide support	Limited discussion of factors
[50]	Selecting major subjects, planning for employment, employability enhancement, vocational development, successful career entry	Career guidance and counselling	Limited description of model
[23]	Positive support, loyalty of intercession delivery, mentoring and relationship-building	Appropriate career choice	Limited description of model
[37]	Parents' professions, mass media,	Explore important factors related to careers	Many influencing factors not considered
[38]	Four Qs model: True believers, convertibles, frustrated and metro docs	Guidance for medical students entering rural medical education programs	Limited sample size, limited audience
[47]	Explore interests, discover opportunities, preparation, implementation	Career selection and development	Influencing factors not considered
[49]	Future interests, importance of studied courses and future interests	Career counselling	Limited sample size, missing values

An analysis of the above models shows that many career selection models aim to explore the influencing factors relevant to career selection and development. Some models provide a few guidelines and stages for appropriate career selection, whereas others are more specific to particular professions. A lot of existing literature covers the important aspects of the career selection process; however, several improvements can be made in these existing models. Datasets or samples along with the evaluation methods used in various career selection models are discussed in the following sections.

A. DATASETS

The datasets for the construction of career selection models have been collected from school and college-level students via interviews or questionnaires [7][9][11] [23][20][22]. As the four Qs model is proposed specially to collect information about medical students' interests and difficulties, only medical graduate students were considered for interviews in the study of [38]. Similarly, in [6], the data was collected from students interested in sports.

B. EVALUATION OF CAREER SELECTION MODELS

In this study, we found that some models are based on interpretive research [7]; therefore, these models are presented in descriptive form, mostly without evidential support from data. Some models are purely based on qualitative data, whereas others are based on qualitative as well as quantitative data [6][11]. A model proposed by Dumulescu et al. in [14] was evaluated through variance and standardized regression. Other models, like the four Qs model based on quantitative data, are evaluated through statistical methods like the Student's T-test and Fisher's Exact Test [1][38][49]. Some models are evaluated through Regression Analysis [37], whereas others are evaluated through mean and standard deviation [42].

VI. DISCUSSION

Existing literature highlights the importance of introducing career counselling services in high school. Career counselling at the secondary level of education is indispensable, as at that stage of life, a student can analyze his or her abilities to choose an appropriate career [29][50]. It is also important for students to study courses that capture their interests. Students' learning and performance improves when they study courses relevant to their interests and aptitudes. Therefore, it is essential to guide students to select careers according to their interests and abilities [49].

Students need guidance to acquire knowledge about existing fields and opportunities. In this regard, parents and teachers play a fundamental role. They know and understand the interests and abilities of their children or students. Researchers describe that students' emotional and behavioral problems are due to a lack of attention from parents and teachers and their lack of interest in students' careers. They claim that, through parents' and teachers' positive support, mentoring and relationship-building, students can be made more ambitious and their lives more peaceful and progressive [13][23]. Many researchers agree that for students' proper counselling it is critical to train counsellors and mentors to enable them to better understand the problems of students and guide them properly [9][22]. Many of the researchers suggest that, when there are proper consultation meetings between teachers, counsellors and parents, the process of counselling becomes more effective [7][10][16][22].

According to the literature, some researchers argue that parents' professions affect the career selections of their children [16][37], whereas others suggest that parents' professions do not usually affect their children's careers [3]. If we critically analyse these studies, we can see that, although it is not necessary that children always adopt the professions of their parents, in some professions, there is a high probability that children adopt their parents' professions, especially in the fields of medicine and law. In addition to parents' professions, family background, family business, personal choice, job security, expected salary and mass media also affect career selection in certain fields [31][16][37]. On the contrary, gender does not affect the career selection process. Both males and females have equal opportunities to join any given profession; however, societal inspiration (like parents' influence) affects females more than males [1][3]. The brief theoretical background of these factors is given below.

1) PARENTS' PROFESSIONS

Parents' professions influence children's career selection [16][37]. In general, parents who belong to a specific profession wish for their children to adopt the same profession because out of a hope for their children to find a pre-established foundation for personal development.

2) FAMILY BACKGROUND

Family background contains many other factors like caste, home environment, liberty level and literacy level. These factors are considered significant to career selection [31][16][37]. For example, if someone wants to become a journalist but news casting or media jobs are considered not as good as teaching or medicine in his family, then it will affect his profession selection.

3) PERSONAL CHOICE

Personal choice describes someone's desired profession. Personal choice is a significant factor [31][16][37] because if a person adopts his profession according to his or her own desires, then, in most cases, he or she puts forth his or her full efforts with more interest and enthusiasm, which ultimately increases productivity.

4) JOB SECURITY

Job security is defined as the guarantee from a job's administration to allow its employees to continue their services for the organization or department. If there is no job security, people will avoid joining a given profession. Therefore, job security is considered an important factor in career selection [31][16][37].

5) EXPECTED SALARY

Every professional wants incentives and rewards for his services. If employees think that they will not gain their expected salary or rewards, then they may not prefer to join that specific profession.

6) MASS MEDIA

Media plays an important role for the publicity of careers and professions. A profession that is given more time in the media will acquire more aspirants as compared to others that do not receive the same media attention.

7) GENDER

Gender is a factor that is considered in many studies to find out how it affects the career selection process. Many authors have opined that gender does not affect career selection. In most countries, both men and women are allowed to adopt any kind of profession in which they are interested [1][3].

A. LIMITATIONS

A limitation to almost all reviewed studies is that the data for career selection have been collected only from high school and graduate students. There has been limited research related to the experiences of professionals. It is important to learn from professionals' experiences; otherwise, a student might discover all the positive and negative aspects of a field only after completing all the relevant studies, requirements and entering that field.

B. COMPARATIVE VIEW OF THE ARAB WORLD, CHINA AND EUROPE

In this review, we have considered studies from many countries. These countries belong to various regions including the Arab world, China and Europe. These regions were focused on for various reasons. First, these three regions represent significant cultural diversity like they have different languages, music, dresses, art, architecture and spirituality. Second, these regions have different civilizations and beliefs. Third, these three regions are dissimilar in infrastructure and unemployment rate; Arab countries are developing countries, China is a rising developing country and Europe has both developing and developed countries. Therefore, by focusing on these three regions, we can analyse the significant factors and issues involved in career selection because the students studied have diverse characteristics.

If we analyze the factors affecting the career selection models in the Arab world, China and Europe, we can observe that personal choice, parents' professions and family background are significant factors around the world. The Arab world comprises developing countries, making Arab job-seekers more conscious about job security during career selection. European countries include developing and developed countries; therefore, at the time of career selection, they consider growth, advancement, self-esteem and personal interests more than other factors. On the other hand, as China has a strong economy that is a market-oriented economy, it shows significant variation in cultural and economic situations in its different regions. Therefore, the level of income within professions and in different regions is quite different. Therefore, we can perceive from the literature that, in China, geographical and economic factors are considered more important than other factors. Table 3 provides the summary of the comparative view of the three selected regions regarding significant factors, prime focuses and issues faced by students from these regions.

TABLE III. Comparative View of Different Regions

Regions	Prime Focus	Issue Faced	Factors
Arab world	Job Security	Arab countries are developing countries; therefore, they have high unemployment rates.	Personal choice, parents' professions and personal background, professional security
China	Geographical and economic factors	China has a market-oriented economy. It has significant variation regarding cultural and economic situations in its different regions. Therefore, the level of income within the same profession and in different regions is quite different.	Salaries, parents' hopes and expectations, views and opinions of others, personal choice, parents' professions and family background, geographical location
Europe	Growth, advancement, self-esteem and personal interests, salary	In Europe, developing countries (including Italy, Cyprus and Romania) have high unemployment rates.	Talent, training cost, expected earnings, personal choice, parents' professions and family background

Currently, in Arab countries, different websites have been launched to aid in career selection, and automated career counselling services are provided by higher education institutions [30]; however, in European countries, special institutions and departments are already working for this purpose [29]. On the other hand, in China, the basic hurdle to implementing

such services is availability and training of counsellors because there are no institutions where counsellors are being trained to assist young people in career selection [41].

VII. CONCLUSIONS

This study sheds light on research related to career selection models. First, studies that highlight and emphasize the influencing factors affecting the career selection process were presented. Despite the importance of these factors, existing career selection models do not fully exploit the influencing factors for a wide range of fields. Second, many studies emphasize relationship-building between students, teachers and parents for proper career counselling. Third, due to the variety of professions and subjects, many studies accentuate the need for relevancy between subjects studied and future interests.

VIII. FUTURE DIRECTIONS

To improve this area of research and provide better career selection guidance for students, many researchers suggest some improvements such as development of self-help online tools for career management [34], comparative studies for career selection from multiple cultures and regions [1] and generalisation of the relationship between professions, career adaptability and career competencies [14]. Studies carried out in one region (e.g. the developed world) might not be applicable in other regions (e.g. the developing) because of differences in systems and the availability of opportunities. Based on the research gaps identified in this study, we suggest developing models that consider multiple influencing factors affecting career selection and incorporate the experiences of existing professionals to provide better career guidance.

REFERENCES

- [1] M.N. Abbasi and N. Sarwat, "Factors Inducing Career Choice: Comparative Study of Five Leading Professions in Pakistan," *Pakistan Journal of Commerce and Social Sciences*, 8(3):830-845, 2014.
- [2] M.N. Abbasi, A. Malik, I.S. Chaudhry and M. Imdadullah, "A study on student satisfaction in Pakistani universities: The case of Bahauddin Zakariya University, Pakistan," *Asian Social Science* 7.7: 209, 2011.
- [3] L. Adamic and O. I. Filiz, "Do jobs run in families?" <http://web.archive.org/web/20170509071950/https://research.fb.com/do-jobs-run-in-families/>. [Last accessed on November 20, 2017].
- [4] J. Akkermans, V. Breninkmeijer, M. Huibers, and R.W. Blonk, "Competencies for the contemporary career: Development and preliminary validation of the career competencies questionnaire," *Journal of Career Development*, 40(3):245-267, 2013.
- [5] T. Amir, I. Gati, and T. Kleiman, "Understanding and interpreting career decision-making difficulties," *Journal of Career Assessment*, 16(3):281-309, 2008.
- [6] K. Ariga, G. Brunello, R. Iwashashi, and L.Rocco, "The stairways to heaven: A model of career choice in sports and games, with an application to chess". IZA Discussion Papers, No. 3327, 2008.
- [7] T. Bedford, "Vocational Guidance Interviews Explored: A Model and Some Training Implications," *Careers Service Branch, Department of Employment, London*, 1982.
- [8] J. Berkovec, and S. Stern, "Job exit behavior of older men," *Econometrica*, 59(1):189-210, 1991.
- [9] E. F. Biller, and E. E. Horn, "A career guidance model for adolescents with learning disabilities," *The School Counsellor*, 38(4):279-286, 1991.
- [10] G. J. Blau, "The measurement and prediction of career commitment," *Journal of Occupational Psychology*, 58(4):277-288, 1985.
- [11] S. D. Brown, and R. W. Lent, "Career development and counselling: Putting theory and research to work," John Wiley & Sons, 2004.
- [12] R. E. Campbell, and J. V. Cellini, "A diagnostic taxonomy of adult career problems," *Journal of Vocational Behavior*, 19(2):175-190, 1981.
- [13] C.T. Clotfelter, H. F. Ladd, and J. L. Vigdor, "Teacher credentials and student achievement: Longitudinal analysis with student fixed effects," *Economics of Education Review*, 26(6):673-682, 2007.
- [14] D. Dumulescu, R. Balazsi, and A. Opre, "Calling and career competencies among Romanian students: the mediating role of career adaptability", *Procedia – Social and Behavioral Sciences*, 209(3), 25-32, 2015a.
- [15] D. Dumulescu, A. Opre, and B. Ramona, "Is Your Career Meaningful? Exploring Career Calling on a Romanian Students Sample," *Procedia– Social and Behavioral Science*, 187:553-558, 2015b.
- [16] D. Fizer, "Factors affecting career choices of college students enrolled in agriculture," *Master of Science Thesis in Agriculture and Natural Resources. USA: University of Tennessee*, 2013.
- [17] J. F. Smythe, S. Haase, E. Thomas, and C. Steele, "Development and validation of the career competencies indicator (cci)," *Journal of Career Assessment*, 21(2):227-248, 2013.
- [18] G. Supriyanto, I. Widiaty, A. G. Abdullah and Y. R. Yustiana, "Application expert system career guidance for students," *Journal of Physics: Conference Series*, 1402, 2019, 066031doi:10.1088/1742-6596/1402/6/066031.
- [19] I. Gati, and I. Asher, "The PIC model for career decision making: Pre-screening, in-depth exploration, and choice," In F. T. L. Leong & A. Barak (Eds.), *Contemporary models in vocational psychology: A Vol. in honor of Samuel H. Osipow* (pp. 7-54). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, 2001.
- [20] I. Gati, and S. Tal, "Decision-Making Models and Career Guidance," pages 157-185. Springer Netherlands, Dordrecht, 2008.
- [21] N. Gikopoulou, "Report on Effective Career Guidance," EPINOIA S.A., 2008.
- [22] N.C. Gysbers, and P. Henderson, "Developing and managing your school guidance program," 3rd ed. American Counselling Association, 2000.
- [23] L. Kern, "Addressing the needs of students with social, emotional, and behavioral problems: Reflections and visions," *Remedial and Special Education*, 36(1):24-27, 2015.
- [24] Z. King, "Career self-management: Its nature, causes and consequences," *Journal of Vocational Behavior*, 65(1):112-133, 2004.
- [25] M. Kuijpers, and J. Scheerens, "Career competencies for the modern career," *Journal of career development*, 32(4):303-319, 2006.

- [26] R. W. Lent, and S. D. Brown, "Social cognitive model of career self-management: Toward a unifying view of adaptive career behavior across the life span," *Journal of counselling psychology*, 60(4):557-568, 2013.
- [27] L. R. Long, and X. H. Huang, "Social ecological model on career decision making for Chinese undergraduates: environmental strength," *Journal of Higher Education*, 27(8), 62–69, 2006.
- [28] J. Mazza, "Jobs and Job Search in Developing Countries: Nice Work if You Can Get it!" Pages 118. Palgrave Macmillan US, New York, 2017.
- [29] R. Mehmood, S. Hafeez, M. Hussain, A. I. Chaudhry, and K. U. Rehman, "Student counselling: Adding value to educational institution," *Journal of Education and Vocational Research*, 2(3):116-119, 2011.
- [30] Y. Y. Moosa, and D. M. Haidar, "Automating Counselling and Career Services in Saudi Arabia Higher Education Institutes," 3(7): 459-474, 2013, DOI: 10.5923/j.mm.20130307.17
- [31] E. Önder, G. Önder, O. Kuvat, and N. Taş, "Identifying the Importance Level of Factors Influencing the Selection of Nursing as a Career Choice Using AHP: Survey to Compare the Precedence of Private Vocational High School Nursing Students and their Parents," *Procedia-Social and Behavioral Sciences*, 122, 398-404, 2014.
- [32] S.H. Osipow, "Assessing career in decision," *Journal of Vocational Behavior*, 55(1):147-154, 1999
- [33] J. O'Sullivan, J. "A Structured Guide to Career Selection," Trafford Publishing, 2004.
- [34] K. Paradžnikė, A. Endriulaitienė, and R. Bandzevičienė, "Career self-management resources in contemporary career frameworks: a literature review," *Organisacijų vadyba: sisteminiai tyrimai*, nr. 76, p. 91-106, 2016.
- [35] A. Rodger, "The seven-point plan," *National Institute of Industrial Psychology*, 1952.
- [36] J. Rounds, and H. E. Tinsley, "Diagnosis and treatment of vocational problem," *Handbook of counselling psychology*, pages 137-177, 1984.
- [37] N. Saleem, A. Mian, H. I. Saleem, and M. S. Rao, "Career selection: Role of parent's profession mass media and personal choice," *Bulletin of Education and Research*, 36(2):25-37, 2014.
- [38] P. Stagg, J. Greenhill, P. Worley et al., "A new model to understand the career choice and practice location decisions of medical graduates," *Rural Remote Health*, 9(4):12-45, 2009.
- [39] J. Sturges, "All in a day's work? Career self-management and the management of the boundary between work and non-work," *Human Resource Management Journal*, 18(2):118-134, 2008.
- [40] A. A. Subait, A. Ali, A.Ibrahim, M. A. Altuwaijry, S. M. Algarni, T. S. Alduhaimi, Y. M. Alotaibi, and A. El-Metwally, "Factors Influencing the Career Choices among Medical University students of King Saud bin Abdul Aziz University, Riyadh Saudi Arabia; A Cross-sectional Study Design," *The Saudi Journal for Dental Research*, Volume 8, Issues 1–2, Pages 73-78, 2017.
- [41] V. J. Sun and M. Yuen, "Career Guidance and Counselling for University Students in China," *International Journal for the Advancement of Counselling*; 34(3): 202–210, 2012.
- [42] P. Sullivan, "A dynamic analysis of educational attainment, occupational choices, and job search," *International Economic Review*, 51(1):289-317, 2010.
- [43] D. E. Super, "A life-span, life-space approach to career development," *Journal of vocational behavior*, 16(3):282-298, 1980.
- [44] T. Mehraj and A. M. Baba, "Scrutinizing Artificial Intelligence based Career Guidance and Counselling Systems: An Appraisal," *International Journal of Interdisciplinary Research and Innovations*, Vol. 7, Issue 1, pp: 402-411, 2019.
- [45] L. Tang and S. H. Jiang, "Rational thought of change on university employment guidance model," *China Higher Education Research*, 1, 44–46, 2004.
- [46] H. E. Tinsley, "Career decision making and career indecision," *Journal of Vocational Behavior*, 41(3):209-211, 1992.
- [47] Uni. of West Florida. Career development model.
<http://web.archive.org/web/20170509072058/http://uwf.edu/oces/career-services/students/career-and-major-exploration/>. [Last accessed on November 20, 2017].
- [48] L. Wen, Q. Hao, and D. Bu, "Understanding the Intentions of Accounting Students in China to Pursue Certified Public Accountant Designation," *Accounting Education*, 24:4, 341-359, 2015, DOI: 10.1080/09639284.2015.1051561
- [49] M. E. Woolley, R. A. Rose, D. K. Orthner, P.T. Akos, and H. Jones-Sanpei, "Advancing academic achievement through career relevance in the middle grades," *Research Journal*, 50(6):1309-1335, 2013.
- [50] R.J. Xavier, A. M. Mehta, and I. Larkin, "Destination public relations: Understanding the sources that influence course selection for and career preferences of postgraduate students," *Prism Online Public Relations Journal*, 5(1 & 2), 2008.