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ORIGINAL PAPER

An analysis of major and career decision-making difficulties of exploratory college students in a Mid-Atlantic University

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Abstract

The nexus between an academic field of study (major) and a career remains nebulous for most undergraduate college students who seek the best-fit major to prepare them for the right career path. Using the CDDQ, Career Decision-making Difficulty Questionnaire (Gati et al in J Counsel Psychol 43:510–526, 1996; A taxonomy of difficulties in career decision making, 2001), a paired sample *t* test was conducted to analyze the impact of a major and career exploration course (COM-200) on 54 undeclared first-year college students in a Mid-Atlantic university. The CDDQ was used to test the hypothesis that at the end of the course, students' career decision-making difficulties would be reduced in each of the three major cluster scores: (1) Lack of Readiness, (2) Lack of Information, and (3) Inconsistent Information. Findings from the study indicate statistically significant difference between the pretest and posttest analysis of the career decision-making difficulty for each of the variables studied.

Keywords Career decision · Undeclared · Undecided · Major and career exploratory · Advising

The changing global economic trends, the demands of the knowledge-based economy and information society, and the recent unemployment rates of college graduates in various academic disciplines, have placed unparalleled pressures on the major and career decision-making of prospective college students. The complexity of this situation is further compounded by the rising cost of college education, which has also raised questions about the traditional premium placed on the value of a university degree as a worthwhile investment, the conduit to better economic opportunities and upward social mobility. While current economic and labor market uncertainties have not diminished the value of college education, they have successfully impacted the career decision-making process of students seeking the

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"market-driven" or "demand-driven" academic programs to increase their employability upon graduation. For some students, deciding on a major is predicated on labor market outcomes. Moreover, what was previously considered a lifelong career may not be true today because "the nature and pace of change in the workplace is so rapid and unpredictable that no curriculum can provide students with all the skills and special knowledge they will need to be employable throughout their working lifetime" (Shaffer and Jacqueline Zalewski 2011a, b, p. 64). Consequently, universities have seen a large percentage of students enroll as undeclared. In fact, it is estimated that about 50% of students enter college undecided and about 75% change their majors at least once before they graduate (Gordon 1995). While factors such as lack of information about academic majors (Beggs et al. 2008) and developmental readiness may explain the level of undecidedness among incoming college students, deciding on a major is one of the gut-wrenching decisions that prospective students have to make about their education. Baker et al. (2018) in their recent study find a significant and positive correlation between choice of major and labor market outcomes (salary, probability, and stability of having a job). Decision about a college major is a function of beliefs about enjoyment of the academic discipline and potential salary after graduation. Baker et al. (2018) estimated that salary is associated with the probability of a student majoring in a given broad field of study. Thus, "a 10% increase in salary leads, respectively, to a 14% to 18% increase in the probability of choosing a major" (p. 26). Although there was no statistically significant difference between choice of major and employability in their study, Baker et al. (2018) noted that the combination of salary and the probability of employment constituted 10% of students who chose a major in the humanities. Zafar (2013) analyzed factors affecting major decisions of 161 sophomores at Northwestern University and found that while male students were more concerned about monetary outcomes of their college majors, both male and female students listed enjoyment of their job and coursework as the two most important factors they considered in selecting college majors.

For first-year exploratory, undeclared college students, determining the right major and figuring out the relationship between academic disciplines and their related careers is a challenging decision. Generally, students think choosing a college major is the same as making a career and lifetime decision. There is lack of information and clarity about this process and, more importantly, lack of understanding of the comprehensive academic curriculum and the demands of the labor market. As Gordon (2006) noted, "the proliferation of academic disciplines, the complexity of the work world, and the unfailing perception on the part of students that college is preparation for a career, require new thinking about how academic and career advising are intertwined" (p. 3). For many university students and their parents, the major–career connection remains blurred. In fact, the first year of college has officially become the acceptable period of academic exploration for most students to solidify their decisions about their majors. Universities are proactively staffed with well-trained academic advisors who help students navigate their ways through this major exploration and career decision quagmire.

Generally, among academic advisors, academic coaches, and career counselors, choosing an academic field of study (major) is not the same as making a lifetime

career decision—these are two interrelated, but different processes. Theoretically, an academic major defines a well-designed academic discipline structured within a broader curriculum framework that leads to the award of a college degree. A career, on the other hand, broadly defines a cluster of interrelated jobs and occupations that involves a series of activities individuals develop over time. Although specialized careers such as engineering, nursing, teaching, and so forth usually require students to pursue specifically designed curriculum, most careers require a combination of skill sets (e.g., being analytically minded, critical, independent, creative, innovative, challenging, communicative, etc.). To be competitive, students have to prepare themselves for global market uncertainties through the combination of skills and human capital formation that will make them productive at different work environments (Shaffer and Jacqueline Zalewski 2011a, b). "Human capital is created when people acquire *transferable skills* that can be applied in many settings and that can inform many different occupations" (Shaffer 1997, p. 6). Unfortunately, "many college students are busily preparing for the past, thinking that they are preparing for the future" (Shaffer 1997, p. 1). Instead of spending time thinking about career, academic counselors encourage students to acquire human capital—the skills that will make them efficient and productive in the workplace. The primacy of acquiring human capital and skill development is also premised on the observation that the average American switches careers several times in their lifetime (Rosenstock 1991; BLS 2012; Shaffer and Jacqueline Zalewski 2011a, b). Thus, focusing on one particular career can restrict future career advancement of individuals. Some majors are broad, while others are career-specific, but to assume holistically that majoring in an academic discipline is choosing a future and lifetime career is a limitation to personal growth and development. Thus, it is the thrust of this paper to argue for the integration of major and career exploration discussions in advising sessions. While previous studies have shown that students' relationships with their parents, siblings, peers, and faculty influenced their major choice (Downey et al. 2011; Kim and Sax 2009), it is surprising to note that academic advisors, who are typically at the forefront of major exploration discussions with students, were accorded little recognition by students (Walmsley et al. 2010).

Purpose of the study

To address the difficulties associated with the major/career decision-making process of first-year students, a one-credit, gradable course (COM-200) was offered to undeclared students to help facilitate their major decision-making process. This paper investigates the impact of COM-200, a major and career exploration course on first-year exploratory college students' decision-making processes. The 34-item CDDQ, Career Decision Difficulty Questionnaire (Gati and Osipow 1996) was used to measure students' level of career difficulty before and after the course.

Literature review

Why major and career advising?

Over the past several years, academic advisors have been challenged to provide advising beyond the curriculum and course requirements to embrace career advising. The importance of integrating career exploration with advising stems from the growing, diverse needs of students enrolling in colleges and universities. Historically, the works of Crookston (1972) and O'Banion (1972) provide a more comprehensive and diverse approach to academic advising. Both Crookston (1972) and O'Banion (1972) recommended a developmental approach to academic advising that not only focuses on curriculum and course requirements, but also includes the infusion of discussion that facilitates the enhancement of the student's academic and intellectual growth and self-development. Such discussion offers opportunities for major, career, and vocational exploration to assist students in making informed educational decisions. Since their ground-breaking work, several other researchers (Frost 1993; Fielstein 1994; Gordon 1994; Grites 1994) have echoed the importance of developmental advising as the pathway for student development. Noel and Levitz (1989) modified O'Banion's model and created five sequential steps (exploration of life goals, exploration of career goals, exploration of major, course selection, and course scheduling) for advisors to use with students. Virginia Gordon also offered a more pragmatic application of developmental advising involving an advising approach that provides students with the opportunity to identify and clarify their academic, career, and life goals, while assisting in the development of their educational plans. Most recently, Jennifer Bloom and her team of researchers conceptualized the 4D model of Appreciative Inquiry and adapted this theory into Appreciative Advising, a wholistic advising model that involves six sequential phases—Disarm, Discover, Dream, Design, Deliver, and Don't Settle (Appreciative Advising Overview)—designed to help students realize their academic potential and career goals, as well as lifelong dreams (Bloom et al. 2008).

The desire for a comprehensive major and career advising course gained more popularity during the 1990s as colleges began to see students with varying degrees of interests, who were not ready to commit to any specific major (Gordon and Steele 2015). This need has been amplified recently because of not merely the number of students entering the tertiary education system as exploratory but also the increasing demand for an economically skillful labor force for the knowledge-based economy and information society. In her seminal works *The undecided college student* (Gordon 1995), *Career decidedness types* (Gordon 1998), and *Career advising* (Gordon 2006), Virginia Gordon makes compelling arguments for the integration of career discussion in academic advising, based on the growing number of college and university students undecided about their majors. The majority of students tend to lack self-information, information about major and careers, decision-making knowledge, vocational identity and maturity, and the ability to make a decision about academic interests (Gordon and Steele

2015). Moreover, Gordon (1984) asserts that some students are either not ready or reluctant to make any educational or vocational commitment. There are students who enter college lacking the confidence to commit to any academic discipline because they (a) do not have a firm understanding of their personalities, interests, strengths, and life goals; (b) are unaware of the various academic programs offered by their institutions; and (c) are naive about the requirements of the job market and various occupations associated with academic majors (Gordon 1984, 1998).

In a comprehensive review of 15 studies on decided and undecided students, Gordon (1998) identified seven subtypes of college students: (a) very decided, (b) somewhat decided, (c) unstable decided, (d) tentatively undecided, (e) developmentally undecided, (f) seriously undecided, and (g) chronically indecisive. Gordon (1998) further divided these categories into three broad sub-categories as follows: (i) three levels of decidedness (very decided, somewhat decided, and unstable decided); (ii) three levels of indecision (tentatively undecided, developmentally undecided, and seriously undecided); (iii) chronically indecisive. Virginia Gordon's categorization reveals that even among the so-called decided students, there remain several who are not ready or unwilling to commit to any specific major (Gordon 1998). To validate her categorizations, Gordon and Steele (2003) analyzed a 25-year longitudinal study comprising 19,813 undecided students at Ohio State University. They found that 22% of students were "completely undecided", 43% had several ideas about their majors but were not ready to decide, and 31% were tentatively decided. In practice, the first 2 years have become the exploratory period for many undecided college students. These students have special needs that must be fulfilled through specially designed major and career exploration interventions in order to help them make accurate and informed decisions about their major and career paths (Gordon 1995).

A major and career exploration course

Choosing a major and career remains one of the monumental decisions for most first-year college students. According to Jeo Cuseo, about 75% of college-bound students are not prepared to make this decision because most high schools do not provide extensive major and career development programs to spark this process. In addition, at the age of 17 and 18, most students are not mature enough to commit to a major they believe will impact the rest of their lives. However, for those who are able to decide on a major before enrolling in college, about a third of them ultimately change their major. In a longitudinal study by the United States Department of Education, National Center for Education Statistics (NCES) reported that while about 97% of students pursuing bachelor's degree programs declared majors in 2011–2012, about 33% changed majors by 2014, during their third year (Leu 2018). At the same time, 35% of students who declared STEM programs and 29% in non-STEM programs changed majors in their third year. As Titley and Titley (1980)

noted, three out of four students entering Colorado State University were not sure about their major or career path. Studies by some institutions show that about 75% (College Central)[1] and 80% (Penn State University)[2] of students entering college are unsure of their major; about 75–80% of college students change their major at least once (EAB 2016), and for others three or more times before graduation (EAB 2016); and approximately 50% of graduates change their career plans after college (Cuseo 2005). However, data from the Student Success Collaborative platform by the Education Advisory Board (EAB) show that the graduation rates of undeclared students who choose their major later in the college career was 83%, compared to 79% for students who declared their major in their first semester at college (EAB 2016).

To address the time students take to declare their majors, universities have created various organizational units and centers to run programs that help students explore their interests. Some institutions admit students who enroll in their universities without a major to established centers or organizational units known as University College, Exploratory Studies, Undeclared or Pre-Major, General Studies, etc. to help them discover an academic and intellectual passion through advising. As a standard admission practice, some flagship institutions in the United States (e.g., Cornell, Columbia, Harvard, Stanford, Yale, University of Pennsylvania, etc.) do not require their First-Time-in-College students to declare a major until they complete their first couple of semesters. Some of these institutions admit students into schools and colleges, while others require students to select a major before they matriculate. Several four-year institutions follow similar paths by providing undeclared students the opportunity to explore the various programs offered at their universities. For example, Ohio University has created the *University College* to support advisement of its students; University of Cincinnati has the *Center for Exploratory Studies*; and Pace University of New York has an *Advising Center of Exploring Majors* to guide undecided and exploratory students in their academic pursuits. West Chester University of Pennsylvania offers similar opportunities for undeclared students in the *Exploratory Studies Academic Advising* under its newly created University College. These units and centers are staffed with professionally trained and experienced academic advisors, counselors, and academic coaches who use different approaches and strategies to help students explore their life and academic goals. While the decision about what to study in college comes naturally to some students, for others, it requires several personality tests and assessments to help them explore their potentials, abilities, and interests. This need provides the impetus to a well-designed course that guides students through the process. As noted by Vincent Tinto,

> The college years are an important growing period in which new social and intellectual experiences are sought as a means of coming to grips with the issue of adult careers. They enter college with the hope that they will be

[1] College Central Undecided/Exploring: https://central.edu/academics/majors/exploring/.

[2] Simon, Cecilia (November 2, 2012). Major Decisions. *The New York Time.* Accessible at https://www.nytimes.com/2012/11/04/education/edlife/choosing-one-college-major-out-of-hundreds.html.

> able to formulate for themselves, not for their parents, a meaningful answer to that important question (Tinto, 1993, p. 40).

Even though Tinto's observation dates back two decades, it remains relevant today. Providing a major and career exploration course that focuses on skill and strength assessments, guided lectures, invited speakers, shadowing of different professionals, and informational interviews provides the platform for undecided students to navigate various academic fields of study to enhance their decision-making process. The importance of a major and career exploration course transcends the enhancement of students' academic growth and personal development to include activities designed to boost their self-confidence in their major and career decision-making processes. Studies have shown that students who took career development courses witnessed a decrease in their career decision difficulty levels, improved self-efficacy, and strengthened confidence about their intended careers (Reese and Miller 2006; Fouad et al. 2016). Chien et al. (2006), for example, examined the effectiveness of a 12-week career training course using a pretest–posttest, non-equivalent control group, and quasi-experimental design. The study showed a significant increase in the career competencies in the cognitive development, as well as the behavioral dimensions of participants who completed the course (pp. 146–152). Similarly, Reese and Miller (2006, 2010) studied 71 students who took a career exploration course as treatment groups and two comparison–control groups with 86 students. The results of their study showed a decrease in course participants' career decision-making difficulty and an increase in their self-efficacy. Moreover, after students completed a career exploration course, Macera and Cohen (2006) found that about 93% of them changed their career plans and became more self-confident in their career decision-making process. A pretest and posttest study conducted by Fouad et al. (2009) on career decision difficulties indicates that students who took the course experienced a decrease in career decision-making difficulties, while their career self-efficacy improved, although there were no changes in participants' perception of barriers to making career decisions.

In another study, Salter (2009) compared two instructional approaches to determine students' career decision-making self-efficacy, career decisiveness, career indecision, and the presence of negative career judgments. Both instructional approaches showed positive improvement in students' career decision-making process and a decrease in their indecisiveness. Whereas the major and career decisions rest on the individual students, the aforementioned studies and many others justify universities' running courses that help students to discover their intellectual passion while solidifying their major and career plans.

To assist undecided students in their major and career exploration, Virginia Gordon recommended six tasks for academic advisors: (i) determine the reasons for being undecided, (ii) identify a plan for major exploration, (iii) provide the support for information gathering, (iv) provide tools to enhance student decision-making process, (v) help students develop an action plan, and (vi) encourage follow-ups (Gordon and Steele 2015). The benefits that students accrue from the extant studies on career development courses cannot be underestimated.

Major and career advising for retention

Some earlier studies on retention show that students who enroll in universities without a major face a high rate of attrition (Foote 1980; Leppel 2001). Sanford and Rivera (1994) suggested that one of the key contributing factors that delays degree completion among college students is the frequency with which they change their majors ("major changers"). Other studies have also shown that student commitment to their educational goals is perhaps one of the major factors of retention and persistence (Frost 1991; Titley and Titley 1980; Willingham 1985; Wyckoff 1999). Noel and Levitz (1995), for instance, believe that the lack of certainty about academic and career paths remains a major cause of attrition for academically competent college students. However, Micceri (2001) argued that changing majors does not affect the graduation time of students. In fact, he stressed that this discovering process helps students make better and more informed decisions about their academic and career paths. More recently, a study by the Education Advisory Board (EAB 2016) shows that the average graduation rate of students who entered the university with a major was 78% compared to 84% of students who declared their major during the second semester or later. Financially, graduating on time saves the student, the institution, and the government an excess educational expenditure (Turner 2004). This is because any additional year beyond the typical four-year period accrues extra cost of tuition. Students may also incur extra costs in terms of foregone earnings and additional subsidies from state and federal government.

According to Joe Cuseo, not all students come to the university with a solid commitment to a major. In fact, some of the "decided students" risk being dismissed from college due to poor judgment and unrealistic decisions about their perceived major or career path. Cuseo (2005) disagreed with the assumption of decisiveness of "decided students" by arguing:

> …it is not accurate to assume that students who enter college with "declared" majors are truly "decided" majors; instead, it is more accurate to conclude that 75% of all students entering college are actually undecided about their academic and career plans, and at least half of all declared majors are "prematurely decided" majors, who will eventually change their minds (p. 32).

Several students entered the university without any clue as to what major or career path they should follow. Only about 8% of students feel knowledgeable in the major they plan to pursue (Cuseo 2005). Thus, the university remains a hub for preparing students to realize their major and career goals.

Intervention: structure of COM-200

The major and career exploration course (COM-200) was designed to assist exploratory students in selecting a college major and developing career options consistent with their academic and life goals. The course, taught by a faculty academic advisor, was designed on a four-step major exploration model (see Fig. 1). Students analyzed

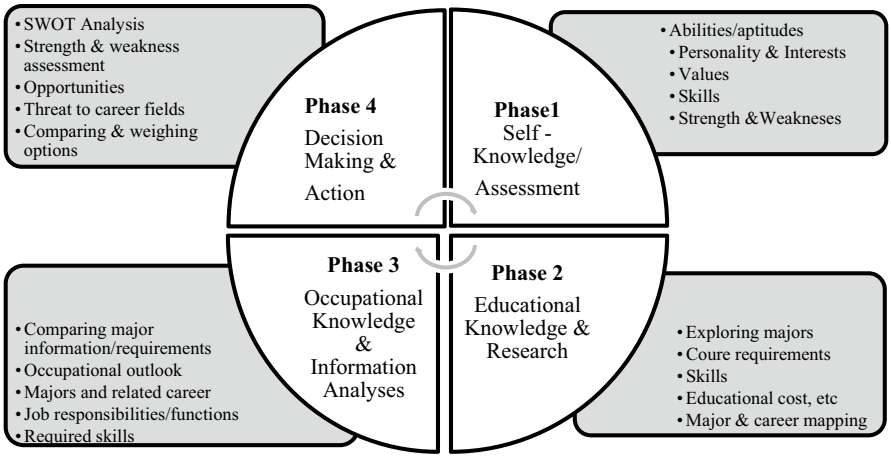

Fig. 1 Major and career exploration model

their personal interests, values, and aptitudes using two major personality and interest assessment instruments: (1) Focus-2, based on John Holland's theory and personality typology, and (2) College Majors Scorecard (Fogg et al. 2008). Students participated in presentations given by two licensed educators who administered the True Colors assessment as a tool for exploring majors and careers. Additionally, two separate presentations were given by career development counselors to help students understand the difference between selecting a major and choosing a career. The course was also infused with mini lectures and guided group activities. The overarching goal was to help students understand the major–career dichotomy while strengthening students' decision-making skills. Guided by an adaptation of Gordon and Steel's (2015) major and career exploration model, the course focused on the following knowledge areas:

Students participated in decision-making using SWOT analysis with the goal of deciding on a suitable major. As part of this process, students learn the differences between college majors and careers. The requirement for successful completion of the course involved four major assignments:

(1) Assignment 1: By having students complete the College Major Scorecard (CMS), the first assignment required students to analyze their values, interests, skills, and abilities in relation to their academic pursuits. Students were required to identify their top personality traits, career values, and interests after completing the assessment and to determine how these relate to their life goals. As a self-scoring and self-interpreting instrument, the CMS relies on students' knowledge and abilities as a means of predicting congruity between an individual and their college major (Fogg et al. 2008).
(2) Assignment 2: The second assignment required students to analyze their educational and career goals by completing Focus-2 assessment. Based on their Focus-2 results, students identified majors and careers of interest by exploring

the similarities and differences among various careers, while providing justification for their selections. In this assignment, students review their Focus results with a career counselor in the University's career development center to identify the common patterns of majors based on their assessment results.

(3) Assignment 3: Through research, students analyzed course information by mapping majors and their requirements in relation to students' values, interests, and skills. The objective of this assignment was to help students understand the academic requirements and expectations of their intended area(s) of interest. In this assignment, students were required to select two or three areas of interest based on the CMS and Focus-2 results and compare and contrast the curriculum requirements in relation to their abilities, strengths, and weaknesses. Students were also required to review the course catalogue to weigh their interests and determine whether they will enjoy the coursework of the particular majors selected.

(4) Assignment 4: In this assignment, students were required to analyze major–career information using cost-and-benefit analysis techniques. Students were required to develop a career SWOT (Strengths, Weaknesses, Opportunities and Threat) analysis technique that would culminate ineffective major–career decision-making. Students were exposed to various internet resources such as the Occupational Outlook Handbook, the O*NET Resources Center, and "what can I do with a major" online resource. By going through this assignment, students were able to weigh their interests against the disciplinary areas they had identified through assessment and research. The goal is to help build students' confidence by clearly evaluating their options in relation to their internal factors (strengths, interests, and weaknesses) and environmental factors such as related careers, employability and salary, or a need for graduate education to advance in the field.

(5) Final Paper: In addition to the above four assignments, students were required to conduct three successive informational interviews to learn more about different majors and careers of interest. Students identified three individuals of their choice, which included, but were not limited to, faculty and staff members, professionals, practitioners, and experts working in their fields of interest to learn more about the nature of job duties and responsibilities.

Research methodology

Initially, 60 students were enrolled in the course (six of them dropped out before the end of the semester). The CDDQ 34-items, Career Decision-Making Difficulty Questionnaire (Gati et al. 1996), was administered during the first week of the class to examine students' decision-making difficulties about major and career. At the end of the 15th week of the class, the CDDQ 34-item questionnaire was re-administered to the same group of students to examine the differences or changes in their difficulties in the career decision-making process. Overall, 54 students completed the study—34 (62.96%) females and 20 (37.04%) males. There were nine African American students, four Hispanics, four Multiracial students, and 37 white students.

The 34-item Career Decision Difficulties Questionnaire (CDDQ) by Gati et al. (1996) was administered to students enrolled in the major and career exploration course. The CDDQ assesses career decision-making difficulties based on the taxonomy proposed by Gati et al. (1996). It measures students' level of career difficulties based on three major clusters—(i) Lack of Readiness, (ii) Lack of Information, and (ii) Inconsistent Information. The alpha internal consistency reliability coefficient ranged from 0.70 to 0.93. The pretest internal reliability of the Conbach alpha coefficient for the present study was 0.71 for Lack of Information, 0.88 for Lack of Readiness, and 0.84 for the Inconsistent Information. The posttest Cronbach alpha reliability coefficient was 0.84 for Lack of Information, 0.91 for the Lack of Readiness, and 0.90 for the Inconsistent Information. The overall Cronbach alpha reliability coefficient was 0.83 and 0.90 for the pretest and posttest, respectively.

Participants

There were 54 students who participated in the study—34 (62.96%) females and 20 (37.04%) males. There were nine African American Students, four Hispanics, four Multiracial, and 37 white students. Students were first-time freshmen. The average age of students was 17.94 years (SD = 1.082). The participants were undeclared first-year students in the Exploratory Studies program.

Research question

The study is designed to answer the question "What impact does the major and career exploration course have on student's major and career decision-making process?"

Hypothesis:

H_0 The null hypothesis (H0) assumes that the difference between the Pretest and Posttest means *(μd)* is equal to zero, i.e., H_0: $\mu d = 0$.

H_1 The alternative hypothesis (H_1) assumes that the Pretest and Posttest mean (μd) is not equal to zero, i.e., H_1: $\mu d \neq 0$ *(two-tailed).*

Instrumentation

Gati et al. (1996) conceptualized their taxonomy of career decision-making based on the assumptions that (1) the ideal career decision-maker is aware of the type of decision to make, (2) any deviations of the decision-making process may involve considerable degree of difficulty, (3) career decision involves two major processes: career decision-making difficulties occurring prior to the career decision-making process and those occurring during the decision-making process, and (4) indecision may be attributed to one or more factors or difficulties. In addition, according to Gati et al. (1996) taxonomy is based on three levels of categorization. The first is Lack of Readiness (sub-divided into lack of motivation, indecisiveness, dysfunctional beliefs

and lack of knowledge about the decision-making steps); the second is Lack of Information (sub-divided in information about self, occupation, and ways of obtaining information); the third is Inconsistent Information due to unreliable information, internal conflicts, and external conflicts. Based on these classifications, Gati et al. (1996) developed the CDDQ to evaluate the career decision difficulties perceived by individuals and empirically examine their taxonomy. The CDDQ has been administered in various educational circumstances. For example, it was administered to 259 young Israeli adults and 304 American University students to determine the difficulties in their career decision process. The results confirmed similar patterns of the hypotheses in both studies. Moreover, Osipow and Gati (1998) examined the construct validity of the CDDQ and found that undecided students have higher scores on the CDDQ. Similarly, the CDDQ was administered to decided and undecided Taiwanese students by Tien (2005); the results indicated that undecided students have more difficulty and score higher on the CDDQ scale than their decided students.

Results and analysis

The mean of items for the three major clusters and the means of the 10 categories of the CDDQ were calculated based on scoring key by Gati and Osipow (1996) as a measured index of the overall difficulty, as follows:

(1) Lack of readiness, which includes Rm, lack of motivation; Ri, general indecisiveness; Rd, dysfunctional beliefs, was calculated as $\frac{Rm+Ri+Rd}{3}$
(2) Lack of Information, which includes Lp, the stages of the career decision-making process; Ls, self; Lo, occupations; La, ways of obtaining additional information, was calculated as $\frac{Lp+Ls+Lo+La}{4}$
(3) Difficulties related to Inconsistent Information, which include Iu, unreliable information; Ii, Internal conflicts; Ie, External conflicts, were calculated as $\frac{Iu+Ii+Ie}{3}$
(4) Finally, the overall difficulty was calculated using the 10 scales as $\frac{Rm+Ri+Rd+Lp+Ls+Lo+La+Iu+Ii+Ie}{10}$

Table 1 presents the pretest and posttest descriptive statistics and the alpha coefficient for the career decision-making difficulty. The internal consistency reliability coefficients (Cronbach alpha) for the pretest subscales were .85 for Lack of Readiness, .84 for Lack of Information, .85 for Inconsistent Information, and .88 for the full scale. The test reliability and internal consistency for the posttest subscales was .91 for Lack of Readiness, .90 for Lack of Information, .91 for Inconsistent Information, and .92 for the full scale. These are consistent with test reliability and validity studies by Gati et al. (1996), Gati and Saka (2001). Students tend to demonstrate moderately high difficulty level on the three major categories of Lack of Readiness, Lack of Information, and Inconsistent Information scales on the CDDQ. The descriptive statistics for the pretest scores show that for Lack of Readiness, the major difficulties exhibited by students were associated with indecision ($M = 6.19$, SD = 1.43) and dysfunctional beliefs ($M = 5.83$, SD = 1.07), which

Table 1 Pretest and posttest descriptive statistics for career decision-making difficulties by gender

Variables	Pretest			Posttest		
	$n=54$			$n=54$		
	M	SD	α*	*M*	SD	α*
Lack of readiness	5.66	0.77	0.85	3.26	0.81	0.91
Motivation	4.96	1.16	0.87	2.49	1.21	0.91
Indecisiveness	6.19	1.43	0.87	3.91	1.05	0.91
Dysfunctional beliefs	5.83	1.07	0.87	3.38	1.07	0.92
Lack of information	5.83	0.90	0.84	2.76	0.73	0.90
About the process	6.14	1.41	0.85	2.97	1.13	0.91
About self	5.48	1.07	0.87	2.61	0.95	0.91
About occupations	6.38	1.14	0.85	3.06	1.01	0.92
Obtaining information	5.32	1.48	0.86	2.38	0.92	0.91
Inconsistent information	5.17	0.73	0.85	2.29	0.60	0.91
Unreliable Inform.	4.98	1.25	0.86	2.64	0.97	0.91
Internal conflicts	5.47	0.91	0.86	2.41	0.61	0.91
External conflicts	5.06	1.08	0.87	1.81	0.79	0.92
Overall difficulties	5.58	0.63	0.88	2.77	0.60	0.92

*α = Cronbach's alpha for reliability test

Table 2 Descriptive statistics and *t* test results for the Career Decision-Making Difficulty

Outcome	Pretest		Posttest		*n*	95% CI for mean difference	*d*	*t**	*df*
	M	SD	*M*	SD					
Lack of readiness	5.66	0.77	3.26	0.81	54	2.13, 2.67	2.43	17.84	53
Lack of information	5.83	0.90	2.76	0.73	54	2.85, 3.31	3.63	26.68	53
Inconsistent information	5.17	0.73	2.29	0.60	54	2.62, 3.15	2.99	22.00	53
Overall difficulties	5.58	0.63	2.77	0.60	54	2.62, 3.01	3.88	28.55	53

*$p < .05$ (two-tailed)

refer to "irrational beliefs and expectations about career decisions, such as the belief that one only chooses a career once and that that choice is necessarily a life-long commitment" (Gati et al. 2001, p. 15). Regarding lack of information, students demonstrated the two highest levels of difficulties in making decisions ($M=6.14$, SD = 1.41) and lacking knowledge about occupations ($M=6.38$, SD = 1.14). These results reflect a general lack of knowledge in making informed decisions about existing and alternative career paths. Regarding difficulty associated with Inconsistent Information, the major factor that accounted for student decision-making resulted from internal conflicts ($M=5.47$, SD = .91), which is due to an inability to compromise personal desires and avoid confusion about different careers. In each of these subscales, the descriptive posttest scores were drastically reduced after completing the course (see Table 1)

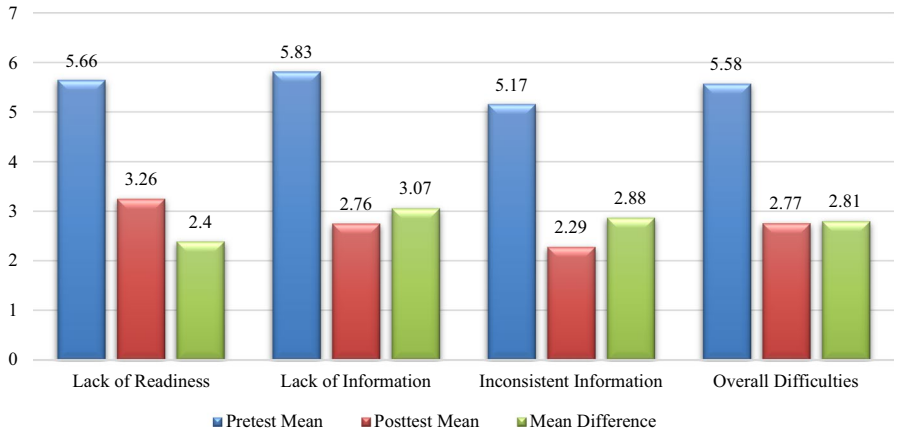

Fig. 2 Career decision-making difficulty based on COM-200 intervention

What impact does the major and career exploration course have on student's career decision-making process?

A paired sample *t* test was conducted to measure the differences in means in the three subscales: (1) Lack of readiness, (2) Lack of Information, and (3) Inconsistent Information. As displayed in Table 2, the *t* tests change in CDDQ for each variable was statistically significant, at the .05 significance level in pretest and posttest scores for the three major subscales. The paired samples *t* test showed a statistically significant decrease in students' career decision-making difficulty related to Lack of Readiness from pretest ($M = 5.66$, SD = .77) to posttest ($M = 3.26$, SD = 0.81) at the .05 level of significance: $t(53) = 17.84$, $p < .05$, 95% CI for mean difference (2.1 to 2.67, $d = 2.43$). A paired sample *t* test showed a statistically significant decrease in students' career decision-making difficulty related to Lack of Information between pretest ($M = 5.83$, SD = .90) and posttest ($M = 2.7$, SD = 0.73) at the .05 level of significance: $t(53) = 26.68$, $p < .05$, 95% CI for mean difference (2.85 to 3.31, $d = 3.63$). Additionally, the paired sample *t* test shows significant difference between the pretest and posttest on the Inconsistent Information of the career decision-making difficulty scale from pretest ($M = 5.17$, SD = .73) to posttest ($M = 2.29$, SD = .60) at the .05 level of significance $t(53) = 22.00$, $p < .05$, 95% CI for mean difference (2.62 to 3.15, $d = 2.99$). Overall, the intervention of the COM-200, major and career exploration course shows a positive impact on decreasing students' levels of difficulty in deciding on a major or career. There was a statistically significant difference in the CDDQ pretest scores ($M = 5.58$, SD = .63) and posttest scores $M = 2.77 = $SD .60) at the .05 level of significance $t(53) = 28.55$, $p < .05$, 95% CI for mean difference (2.62 to 3.01, $d = 3.88$). The results show that students' career decision-making difficulties decreased by 2.40 points in Lack of Readiness, 3.07 points in Lack of Information, 2.88 points in Inconsistent Information, and 2.81 points in overall difficulties (see Fig. 2).

Discussion

This study (dependent sample *t* test) examined the pretest and posttest scores of career decision-making difficulties of first-year undeclared students who enrolled in a major and career exploration course measured by Gati et al. (1996) taxonomy of the CDDQ. The test results showed that students who completed the class increased their confidence level and self-efficacy in their major decision-making process. The pretest and posttest scores showed a significant decrease in student decision-making difficulty levels on the CDDQ subscales (see Fig. 2).

The findings support the hypothesis that when undeclared students are provided with the necessary major and career information and are guided on how to utilize and analyze that information, they become empowered positively in their decision-making process. For this study, the test results indicate that exploratory students, who are typically undecided about their major for reasons such as uncertainty about their career paths and lack of information about occupation, developed clearer ideas about their majors, while becoming more focused on a career path, thereby decreasing their difficulties in the career decision-making process. Overall, COM-200 helped to decrease participants' career decision-making difficulties.

While a student's decision to pursue a specific major in college is influenced by several internal factors such as motivation, interests, strengths, and abilities, as well as other external factors such as parents, peers, faculty, employment opportunities, and salary, this study reveals that students demonstrate various levels of difficulty in committing to a particular field of study at the start of their college careers. For instance, on the three major clusters (subscales) of the CDDQ, students' levels of difficulty were primarily influenced by lack of information about occupations and the process of obtaining information about occupations, followed by a lack of readiness influenced by dysfunctional beliefs, and lastly, inconsistent information about majors and careers. Indecisiveness about a major and career path due to lack of readiness to commit to any specific major was also related to the students' internal conflicts. Inconsistent Information, coupled with lack of knowledge about careers and occupations and labor market uncertainties, are perceived difficulties faced by first-year students in selecting a major.

It is also important to note that while undergraduate students generally lack the knowledge and information about majors and their related careers, exploratory students, in particular, have difficulty making their major/career decision due to several factors, including lack of preparedness and the unwillingness to make the decision. This results from a lack of accurate information about academic programs and their related careers. Statistics on low unemployment among college graduates in specific majors potentially increase students' fear of committing to a discipline. Labor market uncertainties have even forced some college students to weigh the value of their college degree against market conditions as they go through the decision-making process. Thus, it is not uncommon for students to go through a seething of thoughts, asking academic advisors and career counselors: what can I do with so and so major after graduation? Which majors yield

the highest employment probabilities? Will this major earn me enough money to pay off my college debt? What if I don't enjoy what I plan to do after graduation? These are genuine questions, and in fact, some studies have shown that college majors can greatly affect earnings. In a study by George Washington's Center on Education and the Workforce, Anthony Carnevale, Jeff Strohl, and Michelle Melton in their 2011 publication on the economic value of college major reported,

> Not all bachelor's degrees are the same. Earnings are a function not only of which degree you have, but also what you have majored in…while going to college is undoubtedly a wise decision, what you take while you're there matters a lot, too…at the extreme, the highest earning major earns 314 percent more at the median than the lowest- earning major at the median (p. 6).

However, it is important to acknowledge that difficulties associated with major–career decision-making are very typical for first-year undeclared/undecided students. First-year students have many options from which to select their academic majors, hence making the decision process quite difficult. While some academic disciplines are career oriented, several college majors are designed to prepare students to become knowledge entrepreneurs—economically productive with opportunities for self-employment. While the decision to pursue a specific major and career is influenced by student interests, strengths and abilities, and other external factors, such as opportunities for self-employment, this study reveals that students demonstrated various levels of difficulty before the start of the major and career exploration course.

Comments and reflections

The above analyses reveal the decision-making difficulties of first-year exploratory college students. As already noted, deciding on a major is influenced by several factors including lack of preparedness and unwillingness of students to make the decision, current employment probabilities, and unbridled effects of global labor market uncertainties. Another important factor often ignored is the rising cost of post-secondary education. There is nothing more worrisome for students who took thousands of dollars in loans for their education with the anticipation of better job opportunities, to be faced with months or even years of unemployment after graduation. Securing a good paying job could potentially enable students to defray some of the cost of their education, but for many first-year college students, this is an uncompromising factor in their quest for a college major. Prospective and current students are now torn between pursuing an academic discipline of interest that is consistent with their career aspirations, or a demand-driven major that could potentially lead to gainful employment immediately after graduation.

Economically, studies have shown the worth of college majors in terms of their comparative earning power. It is estimated that on the average, "bachelor's degree holders earn 84 percent more than those with a high school diploma….At the extreme, the salary of the highest earning major is 314 percent more at the median than the lowest earning major at the median" (Carnevale et al. 2011, p. 6). As Gillen

et al. (2013) indicated in their study, "from a purely economic standpoint, the numbers back up the prevailing wisdom that college is worth it: College graduates earn more and are less likely to be unemployed than those with only high school diplomas" (p. 1). However, different majors have different economic values. For example, at the low-end, median earning for Early Childhood Education majors is $36,000, while Petroleum Engineering majors witnessed median earnings of $120,000 (Carnevale et al. 2011). A further comparison of college majors, unemployment rates, and earnings revealed that majors such as Chemistry, Elementary Education, Finance, Nursing, and Physical Fitness, Parks and Recreation have the lowest combined average unemployment rate of 5.34%, while Anthropology, Architecture, Film, Video and Photography Arts, Information Systems, and Political Science have the highest combined unemployment rate of 12.52% (Carnevale and Cheah 2013).

Although the availability of these economic data increases students' understanding of the demands of the labor market, these data also confound their decision-making process. In fact, the decision sometimes becomes contemplative for many students—the challenge is that some students are torn between following their interest and the forces of labor market economies. While nationally, the average unemployment rate for 25- to 29-year-old bachelor's degree holders decreased from 5.6 percent in 2010 to 2.9 in 2018 (Hussar et al. 2020), there are some academic majors that have higher levels of unemployment rates. Carnevale and Cheah's (2013) study revealed that although a college degree is the best weapon against unemployment, "recent college graduates with a Bachelor's degree or better are still bearing the greatest unemployment rates ranging from a low of 4.8% to a high of 14.7% depending on their major…the overall unemployment rate for recent college graduates is 7.9%, and the overall unemployment rate for graduate degree holders is 3.3%" (p. 3). While a college degree may increase students' intrinsic value and social class status, its market and economic value remains the biggest rewarding factor. It is important for students to know that, generally, the reward for a college degree depends on several factors such as the type of major they pursue, the type of school attended, and their academic performance (Gillen et al. 2013). Academic performance plays a major role in one's ability to obtain decent employment after graduation. Undoubtedly, the admission process is based on abilities and performance, which is an indicator of success in some majors at college. Gillen et al. (2013) further argue that "students at the top of their classes have more job opportunities than their less academically stellar peers, and the quality of those jobs in terms of financial compensation also is generally better" (p. 3). Second, the earning power of a college degree to a large extent differs across holders from different institutions. According to Mark Hoekstra (2009) cited in Gillen et al. (2013), students who attended an unnamed state flagship institution had wages that were 20% higher than their counterparts who graduated from less prestigious institutions.

How can academic advisors and counselors help?

Whereas the foregoing discussions highlight the factors accounting for the decision-making difficulties of college students, it is important to note that no single academic

field of study is sufficient for the complex and ever-changing global knowledge-based economy and information society. Students have to equip themselves with a diverse portfolio of academic and professional skills to be more competitive. To effectively prepare students for the complex knowledge-based economy, academic and faculty advisors and career counselors must provide the necessary support and information to help students in their decision-making process. Advisors must be versatile and knowledgeable in the demands of the knowledge-based economy. Student-support professionals should embrace the fact that while it is important to talk about skill sets needed for the labor market, it is equally necessary to provide students with economic salary and employability data to help them make informed decisions. For example, academic advisors have to stress the value in acquisition of a diverse repertoire of intellectual, professional, and discipline-specific skills as the conduit for success in a global economy. Although no single suggestion or recommendation can address the myriad of decision-making challenges facing first-year students, the following recommendations may be adopted during academic advising sessions to support students' decision about majors and careers.

Clarify the difference between major and career: It is clear to career experts and academic advisors, as well as employers, that choosing a college major is not the same as a career. However, what is important is the acquisition of critical skills needed to perform multiple job functions. While this makes a case for advocating for a liberal arts education curriculum, there are several specialized career fields that require specialized training and specific majors. Students have to be educated about these differences to enhance their knowledge and decision-making process. Academic advisors should equip exploratory students with the necessary information to enhance their decision-making power.

Engage students in effective informational advising: On average, bachelor's degree holders earn higher salaries in their lifetime than those with lower academic credentials. Academic advisors must go beyond advising that focuses on interpretation and clarification of degree requirements and spend time on explanation of skill sets needed to be successful in the workplace, as well as expose students to available data to empower them to make informed decisions about majors and careers. Studies have shown that majors differ in terms of the rate of returns and employability. For instance, the study by Carnevale and Cheah (2013) revealed that although business remains the most popular among undergraduate majors, the highest median earnings are found in the engineering major group ($75,000), while the least popular are education, psychology, and social work ($42,000). This type of data is available to students, but it is the role of advisors to provide the best interpretation and clarify how to use these data.

Help students understand the requirements of the global knowledge-based economy: Academic advisors must keep abreast of the challenges of the global economy so that they will be able to help students to select course that will enhance their skills and knowledge acquisition. This means, advisors have to be knowledgeable not only about curriculum requirements of their specific advising specialties, but also understand the demands of the global knowledge-based economy to prepare students for the market competition. Advisors have to be familiar with recent labor requirements to provide critical advising to their students.

Adopt collaborative advising strategies to help students: This strategy involves a collaborative working relationship among academic advisors, career development experts, and students. While this might not be immediately relevant to first-year students, it could be part of the initial discussion when students are exploring their options about majors and their related careers. The underlying assumption is that academic advisors help students select academic courses that will prepare them to be creative and critical, and enhance their learning. Career counselors and experts will provide the necessary information about how students can transfer the acquired classroom experiences into employable skills needed for the labor market. Faculty advisors should know and understand what alumni of their departments/programs have done with their majors and understand how their courses have equipped students to pursue particular career paths. Sharing such information with students can help build their confidence in their decisions about majors and careers.

Educate students about opportunities for graduate education: In most cases, students exploring majors do not consider their education beyond the bachelor's degree level at the first year. However, this should be part of the broader conversation with students to broaden their perspective about their education, majors, employability, and salary. Helping students to understand post-college life is part of the entire academic advising and major exploration process. Students should be exposed to different options and opportunities for academic advancement that will potentially increase their employment probabilities. Current studies have shown that while many undergraduate degree holders struggle for employment in their fields of study, employment for graduate degree holders has increased somewhat. Although bachelor's degrees provide a safety net for the current economic turbulence, "…staying on campus to earn a graduate degree provides safe shelter from the immediate economic storm, and will pay off with greater employability and earnings once the graduate enters the labor market" (Carnevale and Cheah 2013, p. 1). However, this is sometimes a hard sell for students who may not have clear career focus. Ideally, one may want to experience the world of work before choosing the appropriate graduate career field worthy of investment.

Conclusion

The decision about a major and career can be overwhelming among exploratory college students. The decision will probably become more difficult as the knowledge-based economy increasingly diversifies. While selecting a college major is not the same as choosing a lifetime career, the former provides the tools needed to fulfill the latter. College education provides the tools necessary for personal and academic growth, and opportunities for future career advancement and individual economic productivity. While college majors have different economic values, these differences do not compromise the value of a university education. To facilitate the major and career decision-making process, prospective students must prepare their mindset about the demands of the global economy; universities must diversify their academic curriculum to meet both the requirements of liberal-based education and the vagaries of the market economies.

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Declarations

Conflicts of interest The author declares no competing interest for this study.

Consent to participate/publish The author confirms that information and data presented in this manuscript does not have any identifiers. All data are in aggregate and are not affiliated to any particular person individual.

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