

Assisting Secondary Ed Seniors in Choosing a Higher Education Academic Major

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Abstract

Data show an increase in time taken by secondary education seniors in fully transitioning into higher education by declaring a major. Many of those who do make an early decision in choosing an academic major end up making numerous changes in degree choice, costing extra time, money and effort in attaining an undergraduate degree. In this project, researchers proposed an informational intervention by administering a strength, preference and interest career rating scale to interested participants from a secondary education setting. The results of augmenting the knowledge base of the participants showed a significant increase in confidence with choosing an academic major, post intervention. A higher effect manifested in Southwest Louisiana, though there was significant effect also in the Northeast region of the state. Researchers suggested federally subsidized programs such as TRIO may be instrumental in the difference of effect size in NELA and SWLA.

Keywords: CIPSI, academic major, higher education, TRIO

1. Introduction

Making the decision to attend college is one of many subsequent decisions which affect the postsecondary educational experience. Prior to enrollment, decision-making processes focus on choosing a college and major, cost versus benefit of attendance, funding options, and meeting academic requirements for admission. Upon enrollment, decision-making shifts to academic and time management, sustainability of funding sources, and continually comparing options regarding major and benefits of persistence in enrollment. Each of these decisions has the potential to impact the financial return on investment for attending college, time to completion of a degree, and overall student success and retention rates.

1.1 Need for Going to College? Job Market.

The research of Anderson and Key (2007) estimated lifetime earning differences of high school graduates and college graduates and found that long-term contributions of human capital in the form of salary and taxes paid to support community infrastructure are significantly higher for college graduates. Additionally, their research, in conjunction with the survey study of Jaradat and Mustafa (2017) suggest the return on investment in college is further enhanced when postsecondary students receive strong support through effective academic advising which results in retainment of major, shorter time to completion of a degree program, and career transitions to competitive jobs in fields that match college programs of study. Based on their literature review, Oreopoulos and Petronijevic (2013) cautioned that due to inflation in expenses associated with college attendance, prospective college students should carefully investigate costs of universities, majors offered, and the predicted occupational outlook of potential job fields prior to making initial college enrollment decisions.

1.2 High School Transition

Venezia and Jaeger (2013) reviewed separate secondary education programs and detailed the discrepancies that students from low income and minority backgrounds face in comparison to higher income counterparts and

acknowledged that with continual budget cuts to institutions of higher education, the financial impact of attending college will adversely affect low income students the most. The researchers also considered potential advantages in the preparation of wealthier students for college predictor exams such as the ACT and SAT as lower income students are not given the same preparation for the exams due to variance in rigor between schools with lower and higher populations of students in poverty and the availability of supplemental preparation courses offered to enhance performance on these exams. Using her Checklist for Student Skills, Owen (2010) identified students' need for research skills to be successful in college and used the transition checklist to identify skills students are missing in an effort to help school staff and families to address those deficits before entering college. In addition to academic challenges faced by prospective college students, Gándara and Bial (2001) reported that many high school students encountered socio-cultural obstacles when preparing for college such as: limited cultural supports, community resources, peer supports, racism, ineffective counseling, and limited contact opportunities with people who have earned a college degree.

1.3 Factors Affecting Major Choice

Jaradat (2017) postulated that by understanding the reasons that students change majors, universities and educators can attempt to address these issues in the beginning of the student's academic career. In Murtagh, Lopes, and Lyons' qualitative study (2011), they recognized that multiple factors contribute to choosing a major, and they determined that intuition, emotion, and cognition as well as practical thought contribute to this choice. In another research study, college students reported personal interests as the deciding factor when choosing their major (Beggs et al., 2008). Other contributing factors included: interest in the subject, family and peer influence, assumptions regarding introductory courses, components of the potential job, and aspects of the major. Dietz (2010) in his research acknowledged that influences such as friends and family are a determining factor in choice and change of major.

In their semi-structured interview, Firmin and MacKillop (2008) identified a lack of knowledge of the chosen major and careers associated as a determining factor for major change. Astin (1993) suggested that components of one's personality affect choice of major, and students are more likely to choose a major based on their strengths defined by certain scales, used in his research study. In their research study, Pabalinas, Teves and Teves (2015) found that a student's first and second choice of career were correlated with the student's multiple intelligences.

1.4 Effects of changing major

The National Center for Education Statistics (2017) reported that thirty-three percent of students in a bachelor's program had changed majors at least once. In contrast, using archival longitudinal data, Allen and Robbins (2010) studied interest-major congruence, motivation, and academic performance as correlates with timely degree attainment and found that when students chose an academic major based on relevant information of their strengths, there was a direct, positive impact on time to degree attainment and an indirect, positive impact on student motivation. Additionally, Allen and Robbins (2010) found that for each year a college student does not graduate, the student lost a significant amount of money invested in postsecondary education. In a meta-analysis of former research, it was discovered another disadvantage to major change was regret (Rose & Summerville, 2005). Another research study showed students who study majors that were not compatible with their strengths and interests were affected by lower rates of job retention and satisfaction in the chosen field upon receiving the degree (Smart et al., 2000). In the analysis performed by Porter and Umbach (2006), they predicted that assisting students in the choice of their major should increase satisfaction with the major and success in obtaining the degree. Jaradat and Mustafa (2017) confirmed the importance of quality academic advising for major retainment and ultimately cost savings for college students.

2. Methods

2.1 Participants

Researchers recruited participants from four public high schools in urban and rural areas in Louisiana, from Northeast Louisiana (NELA) and Southwest Louisiana (SWLA). The final sample consisted of 133 multiracial high school students, aged 16 to 18 years. Investigators enlisted students enrolled in their senior year of secondary training and preparing to enter postsecondary education. All participants responded to the Pre-survey, administered before the Career Interests, Preferences, and Strengths Inventory (CIPSI) and a Post-survey given after the intervention of the CIPSI and personal explanation of students' strengths, interests and preferences (see Table 1).

Table 1. Participant numbers and constructs assessed in each sample.

Participant numbers		Constructs
Sample A	$n = 53$ (female = 26, male = 27)	CIPSI, Pre & Post Survey
Sample B	$n = 41$ (female = 22, male = 19)	CIPSI, Pre & Post Survey
Sample C	$n = 19$ (female = 13, male = 6)	CIPSI, Pre & Post Survey
Sample D	$n = 20$ (female = 10, male = 10)	CIPSI, Pre & Post Survey

Note. Sample A – NELA; Sample B - NELA; Sample C – NELA; Sample D – SWLA.

2.2 Procedure

Ethical approval was obtained for this study (IRB-737) from the University of Louisiana Monroe research ethics committee. Informed Consents were sent to parents of possible participants for review and signature of approval. Students were also given the opportunity to sign an assent to participate. Contact information was placed on informed consents to assist caregivers/guardians in acquiring answers to any questions about the project. Informed consents specified that responses were voluntary, that it was acceptable to refuse to answer or to stop responding at any time during the process, and that there would be no consequences in the event of refusal to answer or ceasing to respond. Upon receiving consent forms, researchers communicated with public school administrators, requesting a time for a site visit. Once a specific date to visit the site was received and upon arrival, the investigators began face-to-face interaction with participants. The first step, after introduction of researchers to participants, was to reiterate the students' rights to refuse or to cease participation at any point in the process. The research primary investigator assigned a different numerical code to each volunteer's pre-survey, in an effort to maintain participant confidentiality. The same identification code was used to coordinate pre-surveys with individual post-surveys, as well as the CIPSI results.

The Pre-survey was given to each individual to assess the present state of comfort with choosing an academic major for postsecondary education. Upon retrieval of completed pre-survey, the participant logged in to a secure web site in which they were introduced to the CIPSI. Once the CIPSI questionnaire was completed, a trained researcher sat with the participant and reviewed the CIPSI report results. Survey results were reviewed with each student participant based on how the embedded algorithm correlated responses with personal preference for the participant. Some students verbally shared career interests prior to the survey which were not aligned to results reported as a result of the inventory. Researcher then discussed the strengths identified by the participant's manner of answering the questionnaire, relating to them the percentage of possibility of success and completion of an academic major closely aligned to the participant's strength. The final component of the interaction with the participant was the administration of the post-survey to measure the confidence of the participant in choosing an academic major.

The research team analyzed the collected data using the statistical software package IBM Statistical Package for Social Sciences (SPSS) (v25). Scores for each sample were analyzed separately by school site, separately by region and finally compared between regions. A paired samples *T* test analysis was used to compare the means of the pre-survey confidence of choosing an academic measure before the intervention and the post-survey of confidence in choosing a major.

3. Measures

Career Interests, Preferences and Strengths Inventory (CIPSI)

All participants responded to this inventory. The CIPSI (Clark et al., 2012) consists of four brief surveys investigating the participant's personal interests, strengths, general preferences, and favored careers aligning the students' choices with the U.S. Department of Education's 16 Career Clusters. The content validity of the CIPSI is based on the degree to which the items align with documented descriptions of the Career Cluster profiles. Because the CIPSI is based on the established descriptions of the 16 Career Clusters created by the U.S. Department of Education and the descriptions of careers made available from the U.S. Department of Labor and verified by career professionals, the CIPSI has content validity.

Test-retest reliability has somewhat limited relevance. The CIPSI is a self-reported perspective on the individual's interests, strengths, preferences, and career choices. These factors are intended to change naturally over time given the influence of new information, experiences, and increased self-awareness. As the clients learn more about specific careers or have internship or employment experiences, it is likely their choices and their CIPSI results will

change. It is meant to be a fluid, ever-evaluating experience rather than one set for all time.

The four surveys include short, low-reading level (grade 3) items that represent careers requiring a broad range of educational and training levels. Average time for completion of inventory is 15 to 30 minutes.

Pre-Survey

All participants completed the pre-survey. The pre-survey was comprised of 5 statements answered by responding to a 5-point Likert scale assessing student confidence in choosing a higher education college major. The Likert scales included (1) Strongly Disagree, (2) Disagree,

(3) Neutral, (4) Agree and (5) Strongly Agree. Statements for rating included; 1) In general, I am greatly satisfied with my educational career, thus far, 2) I have given much consideration in choosing my college major, 3) I have come to a decision in choosing my college major, 4) I am extremely comfortable in my college major choice, and 5) I would appreciate more guidance in assisting me with making a college major decision.

Post-Survey

All participants completed the post-survey. The post-survey was comprised of 5 statements answered by responding to a 5-point Likert scale assessing student confidence in choosing a higher education college major. The Likert scales included (1) Strongly Disagree, (2) Disagree,

(3) Neutral, (4) Agree and (5) Strongly Agree. Questions included; 1) In general, I am greatly satisfied with my experience in participating with this career research project, 2) I found the feedback of my career assessment results very helpful in choosing my college major, 3) Because of the results of my career assessment, I changed my college major decision, 4) I am extremely comfortable in my present college major choice, and 5) I would recommend this project to others in deciding a college major.

Researchers used Cohen's d to analyze effect measures for intervention at each site. Cohen's d is a measure of effect size that assesses the difference between two means in terms of standard deviation (Nolan & Heinzen, 2008). Further, the score helps researchers determine the overlap between two curves.

3. Results

Researchers examined the attitude each student had toward choosing an academic major by using the pre-survey. After administering the intervention, which included the CIPSI and face-to-face feedback, the post-survey was administered to determine confidence in making an informed academic major decision. A paired samples t test was used to compare the means of the pre- survey and post-survey results. Finally, a Cohen d analysis was used to determine the effect measure of the intervention at each site. The R^2 of each survey was measured showing the mean difference from population norms of those feeling satisfied with their choice of an academic major. The standard Cohen d was used: 0.20 – mild; 0.50 – moderate; 0.80 – strong.

Table 2. Cohen d to determine effect size

	<i>Pre</i> μ	<i>Pre</i> SD	<i>Post</i> μ	<i>Post</i> SD	<i>Significance</i>	<i>Cohen d</i> *
<i>Site A</i>	18.49	3.27	19.81	2.92	$p < .05$	0.43
<i>Site B</i>	18.32	3.89	19.15	3.89	$p > .05$	0.24
<i>Site C</i>	19.13	3.18	20.25	2.29	$p > .05$	0.40
<i>Site D</i>	17.35	3.87	20.20	2.38	$p = .001$	0.89

*Effect measure between pre-survey and post intervention survey

Further, investigators performed an analysis on the pre-survey and post-survey results using the Statistical Package for the Social Sciences (SPSS). A paired sample T-test was conducted to compare the satisfactoriness felt by senior-status students in choosing an academic major for higher education without guidance and satisfactoriness in making an informed decision post-intervention in choosing the major. Each school of participants is analyzed separately.

Students viewed their confidence in the informed academic major choice at Site A ($M = 18.49$, $SD = 3.27$) as significantly increased than their decision before the CIPSI intervention ($M = 20.20$, $SD = 2.37$), $t(52) = -2.14$, $p < .05$, $d = 0.43$, and Site D pre-intervention ($M = 17.35$, $SD = 3.87$) compared to post-intervention ($M = 20.20$, $SD = 2.37$), $t(19) = -3.92$, $p < .05$, $d = 0.89$. Within subjects' comparisons for Site B and Site C showed no significant

change in students' satisfactoriness in their academic major decision. Site B pre-intervention ($M = 18.31$, $SD = 3.89$) versus post-intervention was ($M = 19.15$, $SD = 2.81$), $t(40) = -1.09$, $p > .05$, $d = 0.24$ and Site C pre-intervention ($M = 19.13$, $SD = 3.18$) versus post-intervention was ($M = 20.25$, $SD = 2.29$), $t(15) = -1.20$, $p > .05$, $d = 0.40$.

4. Discussion

Students' results at Site A (Cohen $d = 0.43$) suggested they may have experienced more discomfort in selecting an academic major in a higher education setting than those completely satisfied in their choices from the NE region, at Site B ($d = 0.25$) and Site C ($d = 0.37$). According to the Ruffalo Noel Levitz report (2017), high school guidance counselors spend 70% of their time assisting students in planning and scheduling high school courses. Of the remaining time in the school year, the professional spends 46% of that time in helping students complete college applications, 31% of the remaining time finding a good school match and 20% of the remaining time helping students find scholarships and financial aid to pay for their education. That leaves a paltry 20% of the leftover time in the counselor's schedule to assist the student in discovering an appropriate career for the student. Since Site A has a larger number of student population than Site B and Site C, even though only 53 participated in the project, there may have been too little time left from the divided pie to aid in academic major determination.

The intervention demonstrated significantly higher effect measures ($d = 0.89$) at Site D than any of the NE region school sites. One possibility for the large Cohen d may be attributed to the lack of educational outreach programs in the Southwest region. The Northeast region of Louisiana has an active federally supported educational outreach program. One such program called TRIO (2018) provides intensive academic, personal, and career counseling to help students reach their academic goals. Since the Southwest region does not offer such services, the students may suffer a higher degree of anxiety in the decision-making process. Thus, the intervention with those students may have resonated in a greater degree by filling the void that had previously existed. Guidance counselors at each site verbalized their frustration of being the sole provider of secondary education curriculum, as well as facilitating all individualized education plans and 504 Plans for on-site students. Having limited interaction with students considering a future in higher education, seemed to concern most counselors. An expansion of such funded programs may ease the burden on school guidance counselors and open an understanding of students with academic majors and career decisions moving forward.

4.1 Limitations

This study's aims were to investigate the attitude of final year students in secondary education, as it applied to their satisfaction in making a decision for an academic major, transitioning into higher education. There are potential limitations to this study, which were insurmountable at the time of investigation.

One such limitation includes the small sample size both in the Northeast Louisiana sites, and specifically in Southwest Louisiana. Due to the small sample size, it was difficult to discover significant relationships and thus hampered the generalizability of the results. Future research in the area of student satisfaction in decision making for academic majors in higher education would do well to increase the sample size. The basis of the limitation in this study was primarily on the managers of the school sites lack of familiarity with the researchers. Now that the study is completed, the researchers may be able to telescope their study by requesting preliminary study site overseers to vouch for the researchers. Future site principals may feel less concerned and more open to engagement when contacted for participation, if the request is accompanied by a letter of support, from one of their colleagues who already participated in the study.

In keeping with the limitation of small sample size, the researchers acknowledge the notable difference in the number of participants between Northeast Louisiana and the southwestern region of the state. Working to incorporate more sites and a larger cohort of participants from the two separate regions may be a focus for a future study.

Another limitation was the lack of conformability to similarity in the pre-survey and post-survey forms. While the questions in the two parallel forms were minutely different, researchers believe the questions attempted to address the same construct of satisfaction, between a pre-intervention and post-intervention perspective. Researchers will pay special attention to the implementation of similarity of such surveys in a future study.

Finally, the goal of the project was to investigate if administering an intervention of informing a student of a particular personal cognitive strength would make a notable difference in the student's feelings, when choosing an academic major upon entering higher education. An extension of this present study will include contacting this study's participants to measure the efficacy of the intervention. In effect, an examination of the effectiveness of the interventions can be assessed by collecting data, reporting the number of times the participants may have changed

their academic major during the course of the degree studies.

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