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TECHNICAL AND VOCATIONAL EDUCATION UNIVERSITY STUDENTS' CAREER DECISION SELF-EFFICACY: EXPLORING DEMOGRAPHICS IMPLICATIONS

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Abstract
While university students of technical and vocational education must transit smoothly from school to work, inquiries patterning the students' career decisions appear relatively understudied; especially concerning demographic possibilities in predicting their career decision self-efficacy (CDSE). This paper explores the students' CDSE and the implications of their demographics (sex, academic major, and age) on their career decision self-efficacy (self-appraisal, occupational information, goal selection, planning, and problem-solving). Adopting a correlational survey approach, the participants were 451 university students in technical and vocational education from three geopolitical zones in Nigeria. The adopted CDSE scale used for this study showed a good model fit for its construct validity as well as high-reliability coefficients. Mean, standard deviation, bivariate correlation, t-test, and multiple linear regression statistics were applied for data analyses. Findings revealed that the students possessed some level of appreciable CDSE. Findings of multiple regression analysis revealed that academic major (Agricultural, Business, Home Economics, and Technical Education) has a relative association with CDSE. Meanwhile, the results also showed that the demographics have significant joint association with occupational information, goal selection, planning, and problem-solving; but not self-appraisal.
Keywords. Career decision, demographics, self-efficacy, technical education, vocational education.

Introduction

As expected, it has been variously theorized and stated that technical and vocational education and training is a holistic career-oriented programme to prepare its recipients for the world of work (Federal Republic of Nigeria, FRN, 2013). Without being narrow in its scope, TVET prepares individuals with varieties of occupations that make them either self-employed or paid-employed. It is a career-based field of study in higher education where students obtain attitudes, values, and skills in different specialties or academic majors such as agricultural education, business education, computer education, consumer education, entrepreneurship education, home economics education, marketing education and technical/technology education (Chukwuedo & Ementa, 2022; Ekpenyong, 2011; FRN 2013). While this assertion may be true, changes in educational policies, haphazard implementation of policies and guidelines, political instability, family and cultural (societal) dynamism may affect students career decisions. Hence, some pertinent questions need to be periodically answered. For instance, despite persistent unemployment syndrome (Edokpolor, 2020; National Bureau of Statistics, Nigeria, 2020), do TVET students' ability to make career decisions still hold? Could dynamics in personal, educational, and societal characteristics be factors in establishing firm decisions in careers among TVET students? To address, these questions, this study focuses on exploring the

demographic determinants of career decision-making self-efficacy among university students of technical and vocational education.

Drawing upon social cognitive career theory (SCCT – which explains the interrelations among the development of academic, career, and job/employment interests - Lent et al., 1994), career decision self-efficacy (CDSE) is an individual's confidence in their ability to make career decisions. CDSE measures one's extent of belief to successfully complete tasks necessary to making career decisions (Betz et al., 1996; Ogbuanya & Chukwuedo, 2017). It dovetails with an individual's belief in self-appraisal, occupational information, goal selection, planning, and problem-solving about one's career, occupational choices, employability, or jobs (Betz et al.,2005). In technology and vocational education, the measurement of students' CDSE has become imperative because of the dwindling employability among fresh graduates. Although previous studies (e.g., Chukwuedo & Ementa, 2022; Chukwuedo & Ogbuanya, 2020; Kim et al., 2020; Salim et al., 2023; Renn et al., 2014) have explored students CDSE, there seems to be negligence about demographic determinants of CDSE in recent times and especially among TVET students. This study, therefore, intend to add to the body of knowledge and theory about CDSE concerning demographics such as students' sex, academic major, and age.

Sex is the trait that categorizes humans based on their reproductive functions (American Psychology Association, 2010). In this study, students' sex is categorized into male and female only. Believing that human traits differ as a result of differences in their reproductive functions, this study presumes that such differences may be a factor in determining one's level of career decision self-efficacy. Since students are admitted into different academic majors (students' disciplines to which they commit or are offered admission in the university), this study further theories that academic majors may be a predictor of students' CDSE. Furthermore, this study also proposes that age (the length of time of one's existence) may influence one's belief in making career decisions as a result of differences in exposure over time. Of course, technology and vocational education have male and female students with different academic majors and ages, this study also deems it fit to investigate these categories of students. While university students of technical and vocational education must transit smoothly from school to work, inquiries patterning the students' career decisions appear relatively understudied; especially concerning demographic possibilities in predicting their career decision self-efficacy (i.e., self-appraisal, occupational information, goal selection, planning, and problem-solving). Thus, this study explores the students' CDSE and the implications of their demographics (sex, academic major, and age) on their career decision self-efficacy.

Research Questions

The following research questions were answered in this study.

1. What are the students' levels of career decision self-efficacy?
2. What are the correlations between the students' demographic variables and their CDSE?

Hypotheses

The following corresponding hypotheses were also tested at .05 level of significant

1. The students' levels of CDSE (self-appraisal, occupational information, goal selection, planning, and problem solving) will not be significantly higher than expected.
2. The students' demographic variables (sex, academic major, and age) will not jointly or relatively have significant association with CDSE (self-appraisal, occupational information, goal selection, planning, and problem solving).

Methods

This study adopts a descriptively based correlational survey as the research design. Thus, this study describes the level of the students CDSE as well as the association or relationship between the students' demographic variables and their CDSE. The participants of the study were 451 penultimate and final year students of vocational and technical education drawn from three universities, one each from three geopolitical zones (south-east, south-south and south west) Nigeria. The students were made up of male students (n = 201) and female students (n = 250). In a similar vein, the participants were drawn from four academic majors in technical and vocational education: Agricultural Education (n = 76), Business Education (n = 225), Home Economic Education (n = 41), and Technical Education (n = 109).

Questionnaire was the instrument used for data collection. It was made up of the students' demographic variables (sex, academic major, and age) as section A of the instrument, and the career decision self-efficacy scale as section B of the instrument. In the section A, sex was measured as a dummy variable (male =1 vs female =2), academic major was measured in four categories (Agricultural Education =1, Business Education = 2, Home Economic Education = 3, and Technical Education = 4), while age was measured as a continuous variable. For the section B, the CDSE scale was adopted from the 25-item career decision self-efficacy scale – short form (Betz et al., 1996). The CDSE scale has five dimensions or subscales (self-appraisal, occupational information, goal selection, planning and problem-solving) each having five items (See Appendix for items). The scoring of the items was based on five response options (1 to 5).

To establish construct validity and reliability, the scale showed relatively acceptable data fit and reliability coefficients respectively: self-appraisal – (chi-square χ^2 = 9.414, degree of freedom df = 5, goodness-of-fit index GFI = .992, Tucky-Lewis index TLI = .982, comparative fit index CFI = .991, root-men-square error approximation RMSEA = .044, p = .094, and α = .745), occupational information - (χ^2 = 24.365, df = 5, GFI = .950, TLI = .898, CFI = .919, RMSEA = .083, p = .000, and α = .780), goal selection (χ^2 = 20.965, df = 5, GFI = .979, TLI = .933, CFI = .966, RMSEA = .081, p = .000, and α = .791), planning (χ^2 = 17.097, df = 5, GFI = .985, TLI = .959, CFI = .979, RMSEA = .073, p = .004, and α = .785), and problem-solving (χ^2 = 27.019, df = 5, GFI = .977, TLI = .929, CFI = .964, RMSEA = .082, p = .000, and α = .796).

Mean, standard deviation, bivariate correlation, t-test, and multiple linear regression statistics were applied for data analyses. Mean, standard deviation and bivariate correlation were used to answer the research questions, while the one-sample t-test and multiple linear regression were used to test the hypotheses at .05 significant level. However, first, the construct validity was established by applying confirmatory factor analysis indexes from structural equation modelling to describe the psychometric properties of the CDSE (see the preceding paragraph). Mean and one-sample t-test were applied for research question 1 and hypothesis 1 respectively; while bivariate correlation and multiple linear regression were applied for research question 2 and hypothesis 2 respectively. The criteria for establishing a positive or negative correlation was based on r-values ranging between -.35 to +.35 for weak/no correlation; +.35 to +.65 or -.35 to -.65 for moderate correlation; and +.65 to 1.00 or -.65 to -1.00 for strong correlation (Gay et al., 2011).To apply one-sample t-test, a theoretically assumed mean of 3.50 for CDSE scale was used as the criterion mean (test value or expected value) to compare the aggregated or weighted mean of responses for each of the dimensions of the CDSE (c.f., Betz et al., 2005; Ogbuanya & Chukwuedo, 2017). The choice of 3.50 is based on the fact that a graduate is expected to have high level of CDSE. Hence, since the range of score of responses starts from 1 to 5 with corresponding real limits of 1.00 to 1.49, 1.50 to 2.49, 2.50 to 3.49, 3.50 to 4.49, and 4.50 to

5.00, we presumed that 3.50 should optimally be the lowest (critically stretched) average or mean response expected to conclude that a student has expected CDSE. Hence, aggregated or weighted mean responses from 3.50 is considered appreciable level of CDSE.

Results

The results of the statistical data analyses are presented in line with the research questions and corresponding hypotheses as shown in Tables 1, 2 and 3.

Research Question 1. What are levels of the students' levels of career decision self-efficacy?
Hypothesis 1. The students' levels of CDSE (self-appraisal, occupational information, goal selection, planning, and problem solving) will not be significantly higher than expected.

Table 1. Mean, Standard Deviation and t-test of Level of Career Decision Self-efficacy

			Test value = 3.50, df = 450		
Career Decision Self-efficacy (CDSE)	Mean	SD	t-cal.	p-value	CI (LL, UL)
Self- Appraisal	3.908	.647	13.377	.000	.348, .468
Occupational Information	3.855	.738	10.196	.000	.286, .423
Goal Setting	3.746	.755	6.915	.000	.176, .316
Planning	3.863	.741	10.417	.000	.295, .432
Problem-Solving	3.765	.780	7.224	.000	.193, .338

Note. SD = standard deviation, CI = confidence interval, LL = lower limit, UL = upper limit

Table 1 reveals the aggregated or weighted mean responses for self-appraisal (M = 3.908), occupational information (M = 3.855), goal selection (M = 3.746), planning (M = 3.863), and problem-solving (M = 3.765). Compared with the theoretically assumed mean for this study, the students appear to possess appreciable levels of CDSE. Similarly, the table reveals a significantly expected level of self-appraisal (t = 13.377, p < .001), occupational information (t = 10.196, p < .001), goal selection (t = 6.915, p < .001), planning (t = 10.417, p < .001), and problem-solving (t = 7.224, p < .001) among the students.

Research Question 2. What are the correlations between the students' demographic variables and their CDSE?
Hypothesis 2. The students' demographic variables (sex, academic major, and age) will not jointly or relatively have significant association with CDSE (self-appraisal, occupational information, goal selection, planning, and problem solving).

Table 2. Bivariate Correlation Matrix between Variables

Variables	1	2	3	4	5	6	7	8
1. Sex	1							
2. Major	-.147**	1						
3. Age	-.015	-.050	1					
4. Self-Appraisal	-.027	.105*	.022	1				
5. Occupational Information	-.011	.133**	.046	.506**	1			
6. Goal Selection	-.057	.166**	.058	.453**	.646**	1		
7. Planning	-.022	.137**	.069	.346**	.651**	.733**	1	
8. Problem-Solving	.011	.108*	.084	.239**	.558**	.571**	.578**	1

Note. **p< .01, *p< .05.

Data shown in Table 2 reveals the negatively weak correlations between sex and self-appraisal (r = - .027), occupational information (r = - .011), goal selection (r = - .057), as well as planning (r = - .022), but a positively weak correlation between sex and problem-solving (r = .011). The table further reveals positively weak correlations between academic major and self-appraisal (r = .105), occupational information (r = .133), goal selection (r = .166), planning (r = .137), and problem-solving (r = .108). The table also shows positively weak correlations between age and self-appraisal (r = .105), occupational information (r = .133), goal selection (r = .166), planning (r = .137), and problem-solving (r = .108).

Table 3. Summary of Multiple Regression Estimates for Demographic and CDSE

	Regression Coefficients											
	Sex			Academic Major			Age			Model Summary		
CDSE	β	t	P	β	T	P	β	T	P	R^2	F	P
SA	- .011	-. 239	.811	.104	2.194	.029	.027	.584	.560	.012	1.789	.148
OI	.010	.208	.833	.137	2.884	.004	.053	1.135	.257	.020	3.112	.026
GS	- .032	- .680	.497	.164	3.486	.001	.066	1.422	.156	.033	5.067	.002
Planning	.001	- .002	.998	.141	2.979	.003	.076	1.620	.106	.025	3.746	.011
PS	.029	.616	.538	.117	2.461	.014	.090	1.928	.055	.020	3.115	.026

Note. PS = self-appraisal, OI = occupational information, GS = goal selection, PS = problem-solving

The results of Table 3 reveal no significant joint association between the students' demographics (sex, academic major, and age) and self-appraisal (F = 1.789, p > .05); but there were significant joint associations between demographics and occupational information (F = 3.112, p < .05), goal selection (F = 5.067, p < .01), planning (F = 3.746, p < .05) as well as problem-solving (F = 3.115, p < .05). The tables also shows that there were significant relative associations between academic major and self-appraisal (β = .104, p < .05), occupational information (β = .137, p < .01), goal selection (β = .164, p < .01), planning (β = .141, p < .01) as well as (β = .104, p < .05). Conversely, there was no significant relative association between sex and CDSE as well as between age and CDSE.

Discussion and Implication

Drawn from the SCCT (Lent et al., 1994), this study explored the career decision self-efficacy of technical and vocational education students in Universities in Nigeria. The study also explored the influence of the students' demographics (e.g., sex, academic major, and age) on the students' levels of CDSE. Overall, the findings of the study supported the tenets of SCCT, indicating that self-efficacy is an important variable in career decision or job selection (e.g., Chukwuedo & Ementa, 2022; Lent & Brown, 2019; Ogbuanya & Chukwuedo, 2017). Similarly, the findings of this study supported the conceptualization of career decision self-efficacy as a necessary variable to be studied among university or college students (Kepir Savoly & Dost, 2020; Lent & Brown, 2019). Hence, this study validates the tenets of SCCT as well as confirms the need for studying career decision self-efficacy among students.

The findings of this study also show that demographic variables of the students can jointly predict or determine their levels of occupational information, goal selection, planning, and problem-solving. These outcomes are possible, perhaps because occupational information,

goal selection, planning, and problem-solving require multiple sources for an individual to possess such abilities. The findings also show that academic major is a predictor of students' career decision self-efficacy. In essence, academic majors can serve as a means of boosting students' confidence in making career decisions. Although these findings (to the researchers' knowledge) are relatively unique to this study, the outcomes concur with previous studies that have shown that there is a possible relationship between students' characteristics and their career decision self-efficacy and development (e.g., Chukwuedo & Ogbuanya, 2020; Kim et al., 2015; Okolie et al., 2020). In all, the practical implication is that institutions, vocational counselors, and practitioners should consider an individual's academic major as a model for enhancing career decisions and behaviours.

Limitations

Of course, as in other studies, this study is not void of limitations. Cross-sectional survey limits causality. Thus, longitudinal studies are recommended for future research. Homogeneity of sample limits generalization of findings to other groups of individual. Despites, this study covered a wide group of homogenous samples in Nigeria universities. However, future research can focus on heterogeneous sample, bearing in mind the possible flaws inherent in such sample. This study used a theoretically assumed mean to compare aggregated mean responses in order to ascertain level of CDSE. Future research should use a more practical or statistically-based assume mean to compare the weighted mean responses.

Conclusion

Based on the findings of this study, the study of career decision self-efficacy is imperative. This study therefore concludes that TVET students in Nigeria universities possess some levels of CDSE but improvement is needed. The study also concludes that students' academic major is a practical determinant of increasing one's career decision making self-efficacy. Thus, academic major influences confidence in making career decisions in TVET.

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Appendix

The Career Decision Self-Efficacy Scale by Betz et al., 1996

SN	Self-Appraisal Subscale
1	I can accurately assess my abilities
2	I can determine what my ideal job would be
3	I can decide what I value most in an occupation
4	I can figure out what I am and not ready to sacrifice to achieve my goals
5	I can define the type of lifestyle I would like to live
SN	**Occupational Information Subscale**
1	I can find information in the library about occupation I am interested in
2	I can find out the employment trends for an occupation over the next 10 years
3	I can find out the average yearly earning of people in an occupation
4	I can talk to a person already employed in the field I am interested in
5	I can find information about postgraduate or professional schools
SN	**Goal Selection Subscale**
1	I can select one major from a list of potential majors I am considering
2	I can select one occupation from a list of potential occupations I am considering
3	I can choose a career that will fit my preferred lifestyle
4	I can make a career decision and then not worry about whether it was right/wrong
5	I can choose a major or career that will fit my interests
SN	**Planning Subscale**
1	I can make a plan of my goals for the next 5 years
2	I can determine the steps I need to take to successfully complete my chosen major
3	I can prepare a good resume (curriculum vitae)
4	I can identify employers, firms, and institutions relevant to my career possibilities
5	I can successfully manage the job interview process
SN	**Problem-Solving Subscale**
1	I can determine the steps to take if I am having academic trouble with an aspect of my chosen major
2	I can persistently work at my major or career goal even when I get frustrated
3	I can change majors if I did not like my first choice
4	I can change occupations if I am not satisfied with the one I enter
5	I can identify from reasonable major or career alternatives if I am unable to get my first choice