Linking Undergraduate Engineering Students' Outcome Expectations, Interests, Career Goals, Self-Efficacy, Social Support, and Barriers in Singapore: A Social Cognitive Career Theory Study

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Abstract

The present paper assessed the attributes that could influence career decisions among undergraduate engineering students in Singapore. The social cognitive career theory (SCCT) was employed as the theoretical guideline for the investigation. This paper was directed by three main research questions: (1) How do self-efficacy (SE), outcome expectation (OE), social support (SS), barriers (BR), and interests (IN) affect career decisions among engineering students? (2) How do SS, OE, SS, BR, IN, and career goals (CG) correlate? (3) Are there any differences in the psychological factors between freshmen and senior undergraduate students? 27 participants were recruited from an internationally recognized research institution in Singapore. Kruskal-Wallis ANOVA, Spearman rank-order correlation, and Mann-Whitney U tests were implemented to analyze the collected data. Results from this paper revealed that outcome expectations and interests significantly influenced career decisions, while self-efficacy, social support, and barriers did not have a significant effect. Moreover, there were significant correlations among psychological factors, except between career goals and self-efficacy. No significant differences between freshmen and senior engineering students were found in the psychological factors. Limitations and potential directions for future research are explored in greater depth.

Introduction

Making decisions about one's career is a complicated and multi-faceted process involving various individual and contextual factors (Lent et al., 2008; Mohd et al., 2010). Especially the growing emphasis on careers in STEM subjects, in particular engineering, should start from early childhood (e.g., Cunningham et al., 2018; Xiang et al., 2023) to high school (e.g., Burley et al., 2016; Youngblood et al., 2016) levels by facilitating STEM literacy among students as well as improving teachers' teaching engineering confidence (e.g., Hammack & Yeter, 2022). Within Singapore, where the workforce is highly skilled and competitive, career decisions are crucial for individuals to attain successful and satisfying careers (Kuruvilla & Chua, 2000; Selvaraj, 2015). The demand for STEM-related careers in recent years has boosted substantially (Carnevale et al., 2011), which is expected to continue. This seems pertinent to understand the factors influencing career preferences, supporting individuals' career development, and improving career outcomes, particularly among those in STEM fields.

SCCT, established by Lent et al. (1994), is a theoretical guideline widely used to identify career decision-making processes. This theory emphasizes the roles and interactions of individuals and contextual factors that affect career and educational decisions for individuals. Previous research has identified multiple areas relevant to career decision-making: SE, OE, SS, BR, IN, and CG. Nonetheless, limited research studies comprehensively examine the impact of these factors within the specific context of Singapore undergraduate engineering students, who constitute a significant proportion of the country's workforce.

Consequently, this paper examines the potential attributes impacting career decision-making among undergraduate engineering students in Singapore using the SCCT framework, verifying its utility within an Asian context. Specifically, the objective of this paper is to

address the main three research questions: (1) How do SE, OE, SS, BR, and IN affect career decisions among engineering students, (2) How do SE, OE, SS, BR, interests, and CG correlate? (3) Are there any differences in the psychological factors between freshmen and senior undergraduate students? The present paper's findings will contribute to the existing research on career decision-making and provide insights into the factors influencing these decisions among undergraduate engineering students in Singapore. Additionally, the results may aid in developing targeted interventions and policies to support engineering students' career development and increase retention in STEM fields.

Methods

Design

This paper utilized SCCT established by Lent et al. (1994), which posits that cognitive and social factors could influence individuals' career decisions and outcomes. A cross-sectional design was used to examine how SE, OE, interests, social support, BR, and CG are interrelated in the context of SCCT.

Participants

Participants were recruited from an internationally recognized research institution in Singapore, and the paper was restricted to engineering undergraduate students 18 years of age and above. The paper required participants under 21 to submit parental consent before participating. The recruitment process involved snowball sampling. A mass recruitment message was sent on social media platforms to gather participants. The message used a standardized script. No compensation was provided for this paper.

Of the total 27 participants recruited for the present paper, 14 (51.9%) identified as male, 11 (40.7%) as female, one (3.7%) as non-binary, and one (3.7%) did not specify. Eight (29.6%) participants were in Year 1 of university, 14 (51.9%) in Year 2, two (7.4%) in Year 3, and three (11.1%) in Year 4. For participants' university courses, three (11.1%) participants were in Aerospace Engineering, two (7.4%) in Bioengineering, one (3.7%) in Civil Engineering, two (7.4%) in Computer Engineering, five (18.5%) in Computer Science, 10 (37.0%) in Electrical and Electronic Engineering, one (3.7%) in Environmental Engineering, one (3.7%) in Mathematical Sciences, and two (7.4%) in Mechanical Engineering.

Instruments

The paper collected data from participants through several measures of SE, OE, IN, CG, and perceived contextual support and BR in pursuing an engineering major. A 5-point Likert scale was utilized to rate the participants' responses.

Self-Efficacy (SE). Participants' SE was evaluated using eight items inspired by Lent et al. (2003). They were required to score their responses from 1 (*not confident*) to 5 (*completely confident*). The scores for all eight items were averaged to calculate the mean self-efficacy strength scores. Lower scores were indicative of weaker self-efficacy percepts, while higher scores were indicative of stronger self-efficacy percepts. The computed Cronbach's α was .89, reflecting adequate internal consistency.

Outcome Expectation (OE). Ten measures were used to determine participants' OE, inspired by Lent et al. (2003). Participants were required to answer their level of understanding with statements that contained positive outcomes resulting from obtaining a Bachelor of Science degree in engineering (e.g., "graduating with a BS degree in engineering will likely allow me to earn an attractive salary"). Their answers were ranked from 1 (*strongly disagree*) to 5 (*strongly agree*). Mean outcome expectation results were determined by averaging ten items. Lower scores indicated less positive OE, while higher scores reflected greater positive outcomes. The computed Cronbach's α was .88, reflecting adequate internal consistency.

Interests (IN). IN was computed using seven items inspired by Lent et al. (2003). Participants were tasked to declare their level of interest in engaging in certain activities (e.g., "learning new computer applications"), and answers were ranked from 1 (*not at all interested*) to 5 (*very interested*). Mean interest scores were computed with the average scores for all seven items. Greater interest in the listed activities was demonstrated with higher scores, and lower scores indicate lower interest. The computed Cronbach's α was .85, reflecting adequate internal consistency.

Career Goals (CG). CG was computed using six items inspired by Lent et al. (2003). Participants rated their level of understanding with statements regarding their goals (e.g., "I intend to complete my engineering major"). Answers were scored from 1 (*strongly disagree*) to 5 (*strongly agree*). Mean CG results were computed by averaging all six items. Lower scores indicated a lower desire to embark on a career in engineering, while higher scores indicated higher intentions. The computed Cronbach's α was .82, reflecting adequate internal consistency.

Social Supports (SS). Participants' perceptions of SS were computed using 15 items proposed by Lent et al. (2003). Responses to statements (e.g., "feel accepted by your classmates") were rated from 1 (*extremely unlikely*) to 5 (*extremely likely*). Mean support scores were computed using the averages of the scores for all 15 items. Lower scores indicated a more negative perception of SS, while higher scores indicated a more favorable perception of SS. The computed Cronbach's α was .91, reflecting adequate internal consistency.

Barriers (BR). Participants' perceptions of BR they would face were computed using 23 items proposed by Lent et al. (2003). Responses to statements (e.g., "be concerned about the amount of competition among students in this field") were rated from 1 (*extremely unlikely*) to 5 (*extremely likely*). Mean barriers scores were computed with the averages of the scores for the 23 items. Lower scores indicated fewer perceived BR, while higher scores indicated more. The computed Cronbach's α was .92, reflecting adequate internal consistency.

Procedure

Participants assessed the paper on institutionally approved online forms via the weblink provided within the recruitment message. They were introduced to an information sheet containing the paper's details and provided informed consent to participate. They were duly informed that there was an option to cease the paper without reason. Participants were then tasked to complete demographic questions about their gender, current year in school, major, and GPA. Following this, participants were administered a battery of measures that measured SE, OE, interests, CG, SS, and BR in that predetermined order. Upon completion, participants were thanked for their participation.

Data Analysis

The IMB SPSS v25 was utilized to analyze the data collected. Non-parametric tests were employed to answer the three research questions. For RQ1, the Kruskal-Wallis test was utilized. For RQ2, a Spearman rank-order correlation was conducted. Lastly, a Mann-Whitney U test was carried out for RQ3.

Results

A Kruskal-Wallis ANOVA was utilized to examine how self-efficacy, outcome expectation, social support, BR, and IN affect Singaporean undergraduate engineering students' career decisions (RQ1). Self-efficacy (H = 5.56, df = 3, N = 27, p = .135, Cohen's f = .521), social support (H = 6.36, df = 3, N = 27, p = .095, Cohen's f = .570), and BR (H = 1.29, df = 2, N = 27, p = .525, Cohen's f = .228) were not found to be statistically significant, suggesting that no significant differences among groups in terms of these variables and career decisions was observed.

However, the findings showed that outcome expectation (H = 8.06, df = 2, N = 27, p = .018, Cohen's f = .670) and IN (H = 9.99, df = 2, N = 27, p = .007, Cohen's f = .790) were found to be statistically significant, indicating that there were significant differences among groups in terms of these variables and career decisions.

To examine the relationship between SE, OE, SS, BR, interests, and CG (RQ2), a Spearman rank-order correlation was conducted. The results revealed significant correlations among the variables. A correlation matrix of the results is presented in Table 1.

Table 1
Correlations between Variables

	1	2	3	4	5	6
1. SE	-					
2. OE	.52**	-				
3. SP	.66***	.64***	-			
4. BA	-.46*	-.51**	-.53**	-		
5. INT	.43*	.66***	.54**	-.55**	-	
6. CG	.15	.57**	.32	-.40*	.63***	-

*p < .05. **p < .01. ***p < .001.

SE indicated strong positive correlations with OE (r_s = .52, p = .006, two-tailed, N = 27) and social support (r_s = .66, p < .001, two-tailed, N = 27). A medium positive correlation was also shown between SE and interests, r_s = .43, p = .027, two-tailed, N = 27. However, a medium negative correlation existed between SE and BR, r_s = -.46, p = .017, two-tailed, N = 27. Additionally, no correlation was observed between SE and CG, r_s = .15, p = .463, two-tailed, N = 27. OE exhibited strong positive correlations with SS (r_s = .64, p < .001, two-tailed, N = 27), IN (r_s = .66, p < .001, two-tailed, N = 27) and CG (r_s = .57, p = .002, two-tailed, N = 27). Conversely, a strong negative correlation was found between OE and BR, r_s = -.51, p = .007, two-tailed, N = 27.

The findings also indicated a strong positive correlation between SS and interests, $r_s = .54$, $p = .004$, two-tailed, $N = 27$, but a strong negative correlation between SS and BR, $r_s = -.53$, $p = .004$, two-tailed, $N = 27$. No correlation was found between SS and CG, $r_s = .32$, $p = .101$, two-tailed, $N = 27$. A strong negative correlation was demonstrated between IN and BR, $r_s = -.55$, $p = .003$, two-tailed, $N = 27$. In contrast, a strong positive correlation between interests and CG can be observed, $r_s = .63$, $p < .001$, two-tailed, $N = 27$. Additionally, BR were shown to have a medium negative correlation with CG, $r_s = -.40$, $p = .037$, two-tailed, $N = 27$.

A Mann-Whitney U test was conducted to investigate potential differences in psychological factors between freshmen and senior undergraduate engineering students (RQ3). However, the findings revealed that no psychological factors indicated statistically significant differences between the two groups (all $p > .05$). Additionally, among all sub-constructs, *BR* ($\alpha = .92$) has the highest reliability results, and *CG* ($\alpha = .82$) has the lowest. Each sub-construct's reliability findings are given in Table 2.

Table 2. *Reliability coefficient of sub-constructs*

Scale	Cronbach's α
Self-Efficacy	.89
Outcome Expectation	.88
Interests	.85
Career Goals	.82
Supports	.91
Barriers	.92

Discussion

The present paper explored the applicability of the SCCT (Lent et al., 1994) among Singapore undergraduate engineering students. The findings showed that OE and IN were statistically significant factors influencing CG, while SE, SS, and BR were insignificant. These findings contradict the findings of Jiang and Zhang's (2012) paper, which found that SS and BR were predictors of CG in Chinese engineering students.

The results also showed significant associations among the psychological factors studied. SE had a positive correlation with OE and SS and a negative correlation with BR. OE was positively correlated with SS, interests, and CG while negatively correlated with BR. IN was positively correlated with CG and negatively correlated with BR. These results align with the results of Inda et al.'s (2013) paper, which found that SE, OE, and IN mediate the effect of contextual supports and BR on college students' intentions to embark on a degree in engineering. Similarly, Areepattamannil et al. (2011) identified positive correlations among CG, IN, and OE in a large student sample from Canada. Likewise, Lim and Chapman's (2013) paper also found a positive association between interest and OE that aligns with our findings.

The paper identified that SE was positively correlated to OE, SS, and interests, which suggests that higher levels of SE may be due to increased confidence in one's ability to achieve desired outcomes, greater perception of support from others, and greater interest in related activities. These results align with Bandura's (1997) social cognitive theory, which posits that SE beliefs significantly shape a person's career decision-making process. The medium negative correlation between SE and BR suggests that as SE increases, perceptions

of BR to pursue a profession in engineering decrease. However, the absence of a correlation between SE and CG might be suggestive that SE may not directly affect an individual's CG.

Consistent with previous research highlighting the importance of OE in shaping a person's decision-making process (Lent et al., 1994), OE positively correlated with social support, interests, and CG and negatively correlated with BR. These results indicated that higher levels of OE, or the belief in the likelihood of achieving desired career outcomes, could be associated with greater perceptions of SS, stronger related interests, and fewer perceived BR to pursuing a career in engineering.

Social support had a positive correlation with IN and a negative correlation with BR. These findings suggest that higher levels of SS may be related to stronger IN in engineering and fewer perceived BR to pursuing a career in engineering. However, our findings did not reveal correlations between SS and CG in this sample, indicating that SS may not directly influence an individual's CG. This aligns with other research findings, which found that SS indirectly influences career decisions (e.g., Jemini-Gashi et al., 2021; Zhao, 2012).

IN was positively correlated with CG but negatively correlated with BR. These findings suggest that stronger IN in engineering may be associated with higher career goals and fewer perceived BR to pursuing a career in engineering. These findings are consistent with previous research highlighting the significance of IN in shaping an individual's career decision-making process (Holland, 1997). However, the absence of a correlation between IN and SS suggests that IN may not directly influence an individual's perceptions of SS in this sample.

Notably, this paper found no statistically significant differences between freshmen and senior undergraduate engineering students in the context of the psychological aspects examined in this paper. These findings suggest that SE, OE, SS, BR, and IN function similarly for Singapore's freshmen and senior undergraduate engineering students. These findings contrast with previous research evidence, which has suggested that psychological factors may vary between different stages of academic development or life stages (Albion & Fogarty, 2002).

Conclusion, Implications, and Future Recommendations

In conclusion, by examining the SCCT's applicability to undergraduate engineering students in Singapore, this paper adds to its existing literature (Lent et al., 1994). The findings suggested that outcome expectations and IN are significant factors that influence career goals, which aligns with other studies that emphasize that students' IN and attitudes are essential factors in their process of making career decisions (Yeter et al., 2022). At the same time, SE, SS, and BR do not significantly impact career decisions, which is contrary to some research that highlights the significance of the unique backgrounds, skills, and experiences that individuals possess in enhancing their self-efficacy in their engineering skills and knowledge, thus motivating them to pursue engineering as their career (Venkatesh et al., 2022). Moreover, the paper identifies significant correlations between the psychological factors studied, highlighting the significance of these attributes in shaping a person's process of making career decisions. The lack of significant differences between freshmen and senior students indicates that these psychological factors function similarly for both groups.

Nonetheless, the present paper has its limitations. As a result of the limited sample size of this paper, it may be difficult to extrapolate the results to a larger population. Moreover, an important caveat is the disproportionate ratio of seniors to freshmen students within this

sample. Both these limitations may potentially have limited the paper's statistical power. Consequently, readers should exercise caution when drawing conclusions based on these findings. In light of these findings, future studies may wish to replicate the paper with larger and more proportionate sample sizes.

As the current paper's scope was limited to engineering students in Singapore, future research could explore these psychological factors in other academic disciplines and career fields alongside other cultural contexts. For instance, future studies could examine the influence of culture on these psychological factors and how they might affect individuals' career decisions. Moreover, given that engineering education is significantly different from other disciplinary education, it is crucial to examine these psychological factors in the context of other disciplinary education (Bogaard et al., 2021). For instance, previous research provides insights into the ethical considerations (Venkatesh et al., 2022) and interdisciplinary perspectives of engineering education (Yeter et al., 2023), which could inform future research on the psychological factors influencing career decisions in these fields. In addition, further research can explore the impact of various forms of support, such as mentorship and professional development courses, on engineering students' career decision-making (Rathore et al., 2016). Such studies could provide insights into the effectiveness of different types of support in promoting career development and enhancing the psychological aspects that impact career decision-making in engineering and other fields. Such research could contribute to developing interventions to support students in making career decisions across various academic and professional contexts.

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References

Albion, M. J., & Fogarty, G. J. (2002). Factors influencing career decision making in adolescents and adults. *Journal of Career Assessment, 10*(1), 91-126. https://doi.org/10.1177/1069072702010001006

Areepattamannil, S., Freeman, J. G., & Klinger, D. A. (2011). Influence of motivation, self-beliefs, and instructional practices on science achievement of adolescents in Canada. *Social Psychology of Education, 14*, 233-259. https://doi.org/10.1007/s11218-010-9144-9

Bandura, A. (1997). *Self-efficacy: The exercise of control.* W H Freeman.

Bogaard V. d., M., Yeter, I. H., & Strobel, J. (2021). A literature overview of differences between engineering education and other disciplinary education. *2021 IEEE Frontiers in Education Conference (FIE)*. https://doi.org/10.1109/fie49875.2021.9637143

Burley, H., Williams, C. M., Youngblood, T. D., & Yeter, I. H. (2016, June). Understanding" failure" is an Option. In *2016 ASEE Annual Conference & Exposition*. https://peer.asee.org/27095

Burley, H., Youngblood, T. D., Yeter, I. H., & Williams, C. M. (2016, June). Engineering an evaluation for a growing rocket program: Lessons learned. In *2016 ASEE Annual Conference & Exposition*.

Carnevale, A. P., Smith, N., & Melton, M. (2011). STEM: Science Technology Engineering Mathematics. *Georgetown University Center on Education and the Workforce*. http://files.eric.ed.gov/fulltext/ED525297.pdf

Cunningham, C. M., Lachapelle, C. P., & Davis, M. E. (2018). Engineering concepts, practices, and trajectories for early childhood education. *Early engineering learning*, 135-174.

Hammack, R., & Yeter, I. H. (2022, August). Exploring pre-service elementary teachers' engineering teaching efficacy beliefs: A confirmatory analysis study (fundamental). In *2022 ASEE Annual Conference & Exposition*. https://peer.asee.org/41231

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Psychological Assessment Resources.

Inda, M., Rodríguez, C., & Peña, J. V. (2013). Gender differences in applying social cognitive career theory in engineering students. *Journal of Vocational Behavior, 83*(3), 346-355. https://doi.org/10.1016/j.jvb.2013.06.010

Jemini-Gashi, L., Duraku, Z. H., & Kelmendi, K. (2021). Associations between social support, career self-efficacy, and career indecision among youth. *Current Psychology, 40*, 4691-4697. https://doi.org/10.1007/s12144-019-00402-x

Jiang, Z. P., & Zhang, Z. R. (2012). Using social cognitive career theory to predict the academic interests and goals of Chinese middle vocational-technical school students. *Public Personnel Management, 41*(5), 59-68. https://doi.org/10.1177/009102601204100506

Kuruvilla, S., & Chua, R. (2000). How do nations increase workforce skills? Factors influencing the success of the Singapore skills development system. *Global Business Review, 1*(1), 11-47. https://doi.org/10.1177/097215090000100102

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior, 45*(1), 79-122. https://doi.org/10.1006/jvbe.1994.1027

Lent, R. W., Brown, S. D., Schmidt, J., Brenner, B., Lyons, H., & Treistman, D. (2003). Relation of contextual supports and barriers to choice behavior in engineering majors: Test of alternative social cognitive models. *Journal of Counseling Psychology, 50*(4), 458-465. https://doi.org/10.1037/0022-0167.50.4.458

Lent, R. W., Sheu, H. B., Singley, D., Schmidt, J. A., Schmidt, L. C., & Gloster, C. S. (2008). Longitudinal relations of self-efficacy to outcome expectations, interests, and major choice goals in engineering students. *Journal of Vocational Behavior, 73*(2), 328-335. https://doi.org/10.1016/j.jvb.2008.07.005

Lim, S. Y., & Chapman, E. (2013). Development of a short form of the attitudes toward mathematics inventory. *Educational Studies in Mathematics, 82,* 145-164. https://doi.org/10.1007/s10649-012-9414-x

Mohd, F., Salleh, A. M., & Mustapha, R. (2010). The influence of contextual aspects on career decision making of Malaysian technical students. *Procedia-Social and Behavioral Sciences, 7,* 369-375. https://doi.org/10.1016/j.sbspro.2010.10.050

Rathore, G., Froyd, J., Yeter, I., Pariyothorn, M., Kohli, N., & Enjeti, P. (2016). Preparing future engineering faculty: Influences of a professional development seminar on doctoral students' understanding of faculty work. *2016 ASEE Annual Conference & Exposition Proceedings*. https://doi.org/10.18260/p.27336

Selvaraj, P. C. (2015). The effects of work Force diversity on employee performance in Singapore organisations. *International Journal of Business Administration, 6*(2), 17-29. http://dx.doi.org/10.5430/ijba.v6n2p17 Venkatesh, S., Fong, E. W., & Yeter, I. H. (2022). Investigating ethics in an undergraduate design thinking project: The Stanford EDIPT framework approach in Southeast Asia. *2022 IEEE Frontiers in Education Conference (FIE)*. https://doi.org/10.1109/fie56618.2022.9962748

Shamita, V., Yeter, I., & Fong, E. (2022, August). An initial investigation of funds of knowledge for first-generation and continuing-generation engineering students in Singapore. In *2022 ASEE Annual Conference & Exposition*. https://sftp.asee.org/41124

Xiang, S., Yang, W., & Yeter, I. H. (2023). Making a Makerspace for children: A mixed-methods study in Chinese kindergartens. *International Journal of Child-Computer Interaction*, 100583.

Yeter, I. H., Burley, H., Youngblood, T. D., & Williams, C. M. (2016, June). Developing a questionnaire and evaluation methods for a high school rocket program. In *2016 ASEE Annual Conference & Exposition*. https://peer.asee.org/26730

Yeter, I., Radloff, J., & Diordieva, C. (2022, August). Exploring the presence of engineering indices in the Singaporean high school physics standards: A content analysis (work-in-progress). In *2022 ASEE Annual Conference & Exposition*. https://sftp.asee.org/41737

Yeter, I., Tan, V., & Le Ferrand, H. (2023). Conceptualization of biomimicry in engineering context among undergraduate and high school students: An international interdisciplinary exploration. *Biomimetics*, *8*(1), 125. https://doi.org/10.3390/biomimetics8010125

Youngblood, T. D., Yeter, I. H., Williams, C. M., & Burley, H. (2016, June). STEMChoice: An examination of program evaluation data in a STEM-centered, inquiry-based program. In *2016 ASEE Annual Conference & Exposition*. https://peer.asee.org/25875

Zhao, L. (2012). Effects of social supports on the career choice consideration of Chinese farmers: A social cognitive perspective. *The Career Development Quarterly*, *60*(4), 355-366. https://doi.org/10.1002/j.2161-0045.2012.00027.x