

How to improve career construction for civil engineering students?

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ABSTRACT

Career construction has received significant attention from Scholars in various countries. Strengthening career construction is believed to help individuals get closer to students' career choices according to their field of expertise. However, studies on establishing career construction for vocational students involving instructional quality factors, social support, and career self-efficacy have not been found. Therefore, this study examines the antecedent factors that shape career construction by involving instructional quality, social support, and career self-efficacy of vocational high school students. This study proves that career construction is directly influenced positively by career self-efficacy. The instructional quality and social support, however, had no direct impact on how a profession was constructed. Another finding, career self-efficacy is directly influenced positively by the quality of instructional and social support of students. Finally, this study reveals that career self-efficacy acts as a mediator to mediate the effect of instructional quality and social support on the career construction of civil engineering vocational high school students. The findings of this study have significant ramifications for practitioners in vocational education who are creating strengthening programs or career development for vocational students.

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1. INTRODUCTION

Career development and preparation for vocational education graduates is a critical issue to describe the extent to which the success of vocational education in shaping career readiness for students. The primary reason is that philosophically, vocational education is education that prepares students to be skilled in specific skills. So, it is natural that vocational education graduates have high expectations of job acquisition or career success after graduation. In addition, getting a job following the competencies possessed is hope for every vocational education graduate. Thus, information about vocational education graduates' career construction is essential to determine their career readiness. According to Savickas [1], the study of career construction has become increasingly prominent in the study of career psychology. Many scholars give essential attention to career construction development [2]–[6]. Career construction theory is a key idea for individual career development, notably in assisting clients in directing their career choices [5], [7]–[10]. Although much literature examines career construction, there are still limited studies that discuss how career construction is formed among engineering students.

Career construction theory is a career creation model that connects the characteristics of adaptivity, adaptability, adaptation, and adaption to describe the career construction process throughout the course of a person's lifetime [5]. The adaptation model of career construction thus describes the interaction of constant personal characteristics, psychological capacities, career behaviors, and career outcomes and assumes that adequate career behaviors (adapting responses) facilitated by psychological capacity (adaptability resources) and personal characteristics will lead to the best career outcomes (adaptation results) (adaptive readiness). The career construction assessment model, in accordance with Savickas *et al.* [5], crystallizes a vocational self-concept, investigates knowledge about professions, chooses to commit to an occupational choice, and becomes ready to carry out that choice. In principle, career construction theory explains how individuals assimilate their vocational self-concept to their job roles [11]. Because personal demands and societal expectations are successfully integrated, people who are successful in their occupations may adjust in a sustainable way [11], [12]. Furthermore, individuals who have good adaptation will be able to control their careers adaptively by optimizing their psychosocial resources.

In this context, vocational education graduates, especially vocational high school students, orientation toward career success in their respective fields of expertise. The main resources for preparing individuals for career preparedness are learning opportunities and professional internships. After graduation, vocational graduates should have good career readiness, especially in careers following their vocational education choices. However, unfortunately, previous studies found gaps between theory and findings in the field. One of them, a study conducted by Indana [13], revealed that most (90%) graduates of vocational high schools in Trenggalek, Indonesia did not work in the field of education. However, the current condition of the suitability of career choice with education is no longer critical. Workers are encouraged to be able to adapt to all of the needs of the workplace due to changes in the requirements for credentials in the workplace. The hope is that vocational high school graduates must have control over their careers in the world of work through career construction that has been established at school.

Previous researchers found that instructors' professional choices had an impact on the effectiveness of their instruction [8], [14]–[16]. The quality of education or teaching carried out by teachers encourages the strength of students' career plans. Students' learning experiences in schools play an essential role in providing maturity in students' career choices [17]. Role collaboration between learning experiences and personal and contextual aspects could strengthen one's career choice [17]. In addition, the scholars revealed that the quality of teaching encourages the maturity of students to choose their future career plans [18]–[20]. Another aspect that has received much attention from scholars regarding career studies is social support [17], [21]. Support from influential people such as family and friends significantly influences one's career [21]–[25]. Meanwhile, other studies also show that self-efficacy determines the construction of a person's career choice toward the chosen career [4], [14], [21], [26]. As a result, we think that self-efficacy, social support, and high-quality instruction are essential for preparing vocational students for their future careers.

The significance of developing career construction has been studied in several research. Theoretical and practical gaps persist, particularly in regard to how instructional quality, social support, and self-efficacy impact vocational students' career development in the area of mechanical engineering specialization. As a result, the purpose of this study is to investigate the structural career creation model using as its antecedents the instructional quality, social support, and self-efficacy of vocational high school students in the field of mechanical engineering. As a consequence, the goal of this study is to analyze the structural career construction model by using the instructional quality, social support, and self-efficacy of vocational high school students in the area of mechanical engineering as its antecedents. This study aims to investigate the measurement model of vocational high school students' career construction, instructional quality, social support, and self-efficacy; to investigate the effect of instructional quality, social support, and self-efficacy on vocational students' career construction; and to analyze the mediating function of self-efficacy on the influence of instructional quality and social support on vocational students' career construction.

2. LITERATURE REVIEW

2.1. Career construction and instructional quality

According to the career formation idea, professional growth is more like environmental adaptability than simple maturation. A hypothesis concerning career growth is called the career creation theory. Many academics today focus on career development in their research [2], [4], [27], [28]. The hypothesis is based on the developmental, differential, and dynamic views of occupational behavior [5], [11]. In perspective, this theory develops to explain how someone adapts their self-concept to their career choices.

In many cases, career construction is often linked to career adaptability [1] and not yet specified how other vital components shape career construction. This hypothesis contributes to the research on the process of proactive and adaptive career progression through time. According to Savickas *et al.* [5], the link

between the characteristics of adaptivity, adaptability, adapting, and adaptation may be used to explain career formation. In conclusion, this career architecture demonstrates how having the right professional behavior backed by the right psychological skills and personality attributes will lead to the best career outcomes.

A career creation questionnaire designed for counselors and researchers has been evaluated by Savickas *et al.* [5] to determine its reliability. The goal of the inventory research is to quantify the adaptive responses—which include job-related thought and behavior—involved in making career decisions. Career development for vocational high school students has a strategic role, especially in preparing vocational high school graduates to have strong career choices. Looking at the basic theory of vocational education, vocational education aims to prepare skilled individuals for certain types of work [29]. That is, vocational high school graduates must have a career choice following their field of expertise. Career construction studies are often associated with career choices or career adaptability [5]. Many factors impact career development in the context of schooling. One of them is the instructional quality of the instructor when teaching in the classroom. The ability of teachers to mobilize students' confidence in their vocational abilities can strengthen students' career choices [25]. This means that career self-efficacy or students' beliefs about their career abilities also contribute to their increased perceptions of career choices. Other scholars also revealed that the quality of teacher teaching has a positive impact on students' career formation [15], [16]. The vocational-related learning experience provided by the teacher to students will instill experience about the perception of the vocational career they will choose as previous studies stated that students' learning experiences in schools play an essential role in providing maturity of students' career choices [17].

This literature review provides an essential point that instructional quality is an essential factor when teachers will shape the career construction of vocational students. Thus, teachers must strive to develop and improve their instructional quality to direct students closer to their career choice after graduation. According to prior research, career building may be assessed by determining how far a person perceives their ability to develop a professional self-concept, learn about various occupations, make a decision about which occupation to pursue, and be ready to pursue that option [5]. Thus, the hypothesis of the study: Instructional quality has a positive influence on the career construction of civil engineering vocational high school students (H1); and instructional quality has a positive influence on career self-efficacy of civil engineering high school students (H2).

2.2. The role of social support: career self-efficacy and career construction

According to theory, social support is acquired by resources made available by others [30]. Social support may come from a variety of places, including material support, approval support, self-esteem support, and belonging support [31]. Social support, in the context of professional development, refers to the assistance received in the form of money or emotional support during their socialization process. As a result, it will encourage positive thinking, reason, and optimism in their hopes for professional advancement [32]. Positive sources of social support help individuals to believe in their abilities, especially regarding their career abilities [33]. Previous studies have also revealed that social support provides an impetus for increasing individual career adaptability [25]. Adolescents are more upbeat about their professional growth when their parents are supportive and supportive [34]. Parental and teacher support is positively connected to career optimism, and this direct association is entirely mediated by self-efficacy in making professional decisions [35]. Social support also assists students in making better professional selections and encourages them to explore and plan their future with optimism [36]. As a result, we believe that social support increases students' career self-efficacy and growth. According to the explanation, the proposed hypothesis: Social support has a positive influence on the formation of career construction for civil engineering vocational high school students (H3); and social support has a positive influence on the career self-efficacy of civil engineering vocational high school students (H4).

2.3. The mediating role of career self-efficacy

Career development studies have involved many important self-efficacy factors, especially regarding individual beliefs about their career abilities [35], [37], [38]. Career self-efficacy, according to Taylor and Betz [39], is the belief that a person has in their capacity to carry out career-related activities. High levels of career self-efficacy assist people to overcome career obstacles and have a beneficial influence on decision-making attitudes and behavior [40]. The most significant element affecting students' decision to pursue a job is their level of career self-efficacy [41]. Furthermore, professional self-efficacy moderates the influence of educational quality and social support on occupational flexibility [25]. Self-efficacy is mentioned in other pertinent research as a mediator between social support and career flexibility [42]. This literature review indicates that building career self-efficacy for civil engineering vocational high school students is very important to help them strengthen their career construction. Thus, career self-efficacy is thought to operate as a moderator of the impact of instructional quality and social support on the career development of civil engineering vocational high school students. Hence, the proposed hypothesis: Career

self-efficacy significantly affects the career construction of civil engineering high school students (H5); Career self-efficacy significantly mediates the effect of instructional quality on career construction of civil engineering vocational high school students (H6); and Career self-efficacy significantly mediates the effect of social support on the career construction of civil engineering high school students (H7).

Building a database from the previous literature, it can be highlighted that career construction is an essential aspect for civil engineering vocational high school students while still paying attention to other essential factors that play a role in strengthening career construction. These essential components include the caliber of the training, social support, and professional self-efficacy. As a result, Figure 1 shows conceptual model development.

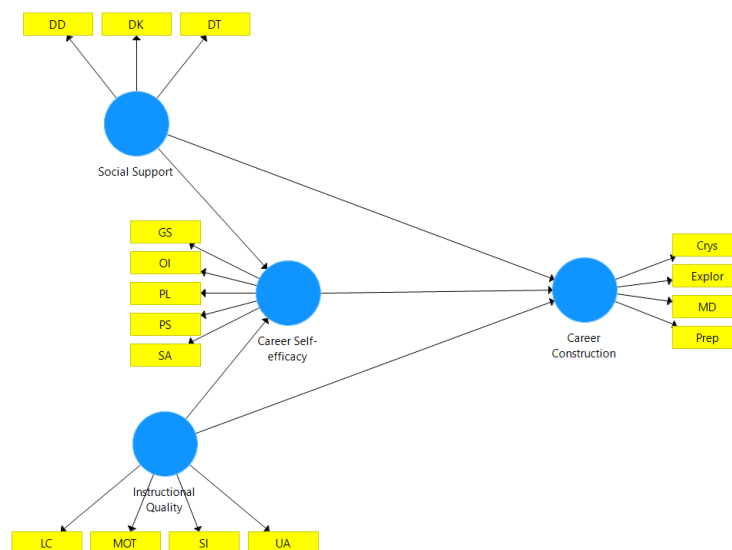


Figure 1. Conceptual model

3. RESEARCH METHOD

Students from Surakarta's state vocational high school for civil engineering competence participated in this study. Online surveys were issued at random to vocational students with specialization in civil engineering in Surakarta, Indonesia. Out of the 400 questionnaires distributed, 255 were sent for analysis. There were 190 (74.5%) male students and 65 (25.5%) female students among those who responded. In the online questionnaire, students assessed their perceptions of instructional quality, social support, career self-efficacy, and career construction on themselves. The development of this study questionnaire used a reference to previous studies consisting of an instructional quality questionnaire [43], [44], social support [45], self-efficacy career [46], and career construction [5]. All instruments use a Likert scale with five alternative answers (strongly agree=5, agree=4, somewhat agree=3, disagree=2, strongly disagree=1).

Partially least squares (PLS) analysis of structural equation modeling (SEM) was utilized in this study to evaluate the relationship between variable constructs, including both exogenous and endogenous variables, while also accounting for measurement errors [47]. We used the SmartPLS 3.0 software to test the hypotheses of this study. PLS is a variant-based SEM analysis that evaluates both the structural and measurement models at once [48]. The outer model (measurement model) in the PLS-SEM analysis aims to test the reliability of the questionnaire. The loading factor parameter and the average variance extracted (AVE) value are used in the outer model testing criterion. The criterion employed include a loading factor parameter value more than 0.7 and an AVE value greater than 0.5 [49]. Meanwhile, hypothesis testing employs the inner model testing criterion, with the hypothesis accepted if the p-value is less than 0.05 and rejected if it is more than 0.05.

4. RESULTS

4.1. Validity and reliability test

Testing the questionnaire's reliability and validity comes first in the analysis of this study. PLS-SEM was used to assess the questionnaire's validity and reliability on vocational students' views of teaching quality, social support, career self-efficacy, and career construction in the field of civil engineering (outer

model). Confirmatory factor analysis is used in this test on the outer SEM model created with SmartPLS (v.3.2.9). Figure 2 displays the findings of the first running model.

The outcomes of the outer model analysis undertaken to evaluate the validity and reliability of the surveys on instructional quality, social support, career self-efficacy, and career creation are shown in Figure 2 and Table 1. The results of the outer model analysis on all variables show valid (.779~.940) and reliable results (.796~.944). In the validity test, each indicator shows a loading factor value above 0.70. Each indicator on each variable can explain the latent variables in this study. In addition, reliability testing also shows an AVE value above 0.50. This finding means that the questionnaire used in this study is accurate for measuring student perceptions of instructional quality, social support, career self-efficacy, and career construction for civil engineering vocational high school students.

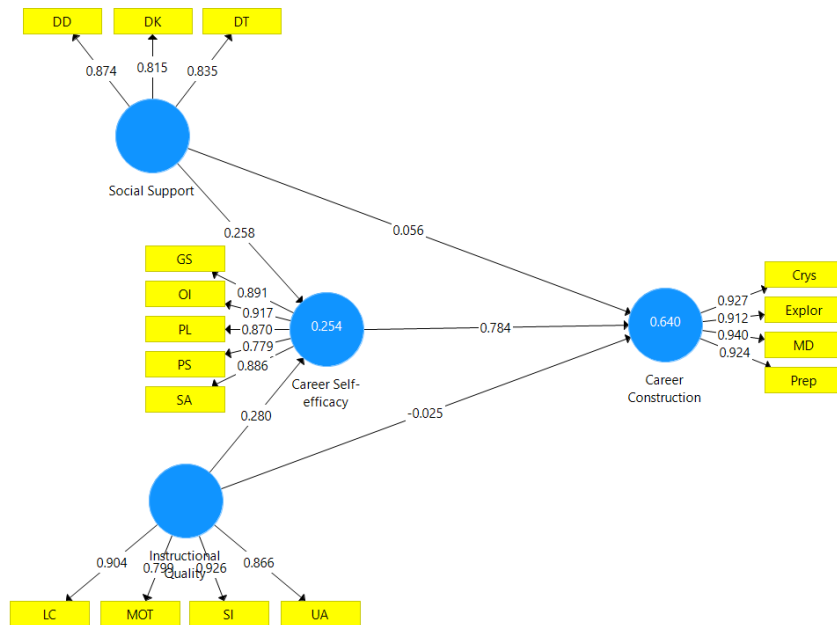


Figure 2. Path diagram of career construction antecedent factors for vocational high school students

Table 1. Questionnaire validity and reliability

| Variables (N) | Validity | Cronbach's alpha | Composite reliability | AVE |
|-----------------------|-------------|------------------|-----------------------|------|
| Instructional quality | .799 ~ .926 | .897 | .929 | .766 |
| Social support | .815 ~ .874 | .796 | .879 | .709 |
| Career self-efficacy | .779 ~ .891 | .919 | .939 | .756 |
| Career construction | .912 ~ .940 | .944 | .960 | .857 |

4.2. Hypothesis testing using SEM analysis

The path coefficient test is used in this study to assess the hypothesis. However, before evaluating the hypothesis, the fit model must be tested using the goodness of fit test. The normed fit index (NFI=0.823) and standardized root mean square residual (SRMR=0.70) values are good and match the model fit criteria, according to the goodness of fit criterion test using SmartPLS-SEM. The model is said to be fit if it has an NFI value above 0.8 and an SRMR below 0.08 [50]. Furthermore, the hypothesis testing analysis can be done using the bootstrapping test method on smartPLS 3.2.9. The Bootstrapping method is used to test the significance of each chosen hypothesis. This study used 1000 bootstrap samples with a 95% confidence level. The results of this study's hypothesis testing are shown in Table 2.

In Table 2, it is known that the first hypothesis testing obtained a p-value of 0.684. If the p-value is less than 0.05, the hypothesis is accepted (p 0.05). Thus, the first hypothesis is not accepted and means that instructional quality does not affect the career construction of civil engineering vocational high school students. Meanwhile, instructional quality significantly affected students' career self-efficacy (the second hypothesis was accepted, p<0.05). Findings related to the insignificant effect were also shown on the effect of social support on career construction. The significance value or p-values is 0.255, meaning that p>0.05, and the third hypothesis is rejected. Testing the fourth hypothesis shows the acquisition of p-values of 0.002,

meaning that $p < 0.05$, and the fourth hypothesis is accepted. Social support has a considerable impact on civil engineering vocational high school students' career self-efficacy. Furthermore, other findings related to the direct effect also show that career self-efficacy significantly influences the career construction of civil engineering vocational high school students. This is because the acquisition of p -values is 0.000, meaning that the fifth hypothesis is accepted.

Table 2. Hypothesis testing results

| Hypothesis | T Statistic | P-Values |
|--|-------------|----------|
| Instructional quality → Career construction | 0.407 | 0.684 |
| Instructional quality → Career self-efficacy | 2.721 | 0.007 |
| Social support → Career construction | 1.139 | 0.255 |
| Social support → Career self-efficacy | 3.040 | 0.002 |
| Career self-efficacy → Career construction | 20.689 | 0.000 |
| Instructional Quality → Career self-efficacy → Career construction | 2.718 | 0.007 |
| Social support → Career self-efficacy → Career construction | 2.939 | 0.003 |

In testing the indirect effect of this study using the SmartPLS-SEM bootstrapping method. The sixth hypothesis test revealed p -values of 0.007 for the mediation test of career self-efficacy on the impact of instructional quality on career creation, indicating that the hypothesis was accepted. This finding suggests that career self-efficacy significantly moderates the influence of instructional quality on career development among high school students majoring in civil engineering. Moreover finally, testing the role of mediation was also carried out on the seventh hypothesis test. The mediation test yielded p -values of 0.003 ($p = 0.05$), indicating that career self-efficacy significantly moderated the influence of social support on the career construction of civil engineering vocational high school students.

5. DISCUSSION

Career development for vocational students is an essential aspect of vocational education. This is because vocational education has characteristics of an educational institution that prepares prospective workers in certain areas of expertise. Strengthening the career construction of civil engineering vocational high school students helps strengthen students' career plans when they graduate. The purpose of this research is to better understand the factors that encourage high school students to career construction in civil engineering. Instructional quality, social support, and career self-efficacy are among these characteristics. This study also investigates the role of professional self-efficacy in mitigating the effects of educational quality and social support on career advancement.

The findings showed that the sole factor significantly and favorably affecting how high school students majoring in civil engineering build their careers is career self-efficacy. While this was going on, other elements like the caliber of the education and social support had little to no impact on how the students in the civil engineering vocational high schools built their careers. This conclusion is pertinent to earlier research that shown professional self-efficacy had a direct impact on polytechnic students' capacity to modify their careers [25]. In a similar context related to career decisions, career self-efficacy is crucial to encourage individuals to make career choices. The ability to overcome career barriers increases with an individual's level of career self-efficacy [40]. Students' confidence in their job-related skills, such as self-evaluation, occupational knowledge, goal selection, planning, and problem-solving, improves the quality of their career construction. In order to increase their future profession options, students must be aware of their strengths or potential and be able to channel it. Additionally, their confidence in their capacity to deal with issues linked to their jobs enhances the foundation they have built for their careers. Students at civil engineering vocational high schools must complete a learning program that includes components of career self-efficacy such as self-evaluation, occupational information, goal selection, planning, and problem-solving.

Another conclusion is that students at vocational high schools for civil engineering do not directly benefit from improving career construction due to instructional quality. This study's findings are similar with previous research, which found no clear association between teaching quality and career flexibility [25]. These findings differ theoretically; the quality of teaching has an important influence on the formation of students' careers [15]. Good teaching quality will provide a positive learning experience, significantly strengthening students' careers. Lent and Brown [17] reveal that the vocational-related learning experiences provided by teachers to students will instill experiences about the perception of the vocational career they will choose. This means that the aspects of instructional quality consisting of motivation, understandable news, student involvement, and learning context have not been able to encourage strengthened career

construction. The effectiveness of this instruction directly affects how strongly vocational students feel they can succeed in their chosen careers. Subsequently, it influences the career construction of vocational students—the better the teacher's instructional quality, the stronger students' confidence in their career abilities. Furthermore, the strength of self-efficacy related to their careers will encourage the strengthening of crystallizing vocational self-concepts, exploring occupations, making decisions, and preparing for the careers of civil engineering vocational high school students.

Similar results on the influence of social support on career development were also demonstrated. The study's findings demonstrate that social support has no direct influence on how students at civil engineering vocational high school build their careers. On the other hand, social support has an indirect impact on career development through students at the civil engineering vocational high school's perception of their own professional effectiveness. Students at the civil engineering vocational high school will eventually be impacted by their career construction as a result of the social support they receive from their instructors, peers, and families. This study reinforces previous studies that showed that social support was positively related to career self-efficacy [21]. Empirically, social support does not directly affect strengthening career construction but must go through their career self-efficacy. The closest people who have an important influence on the individual need to encourage students' career choices and need to understand the career prospects for the individual. The higher the support obtained by students, the higher the ability of students to assess their potential, obtain career information, choose a career, and overcome problems related to their career choices.

This study also highlights career self-efficacy as an important factor that needs to be developed through the learning process at school. Teachers need to include in the curriculum related to strengthening aspects of career self-efficacy starting from planning, implementing, and evaluating students' career self-efficacy strengthening. Increasing the quality of instructional factors is not enough to shape students' career construction but also needs to involve parents in monitoring and supporting students' career choices. It is hoped that integrating the learning process and the social support monitoring program will strengthen the career construction formation of civil engineering vocational high school students. The findings of this study have consequences for those who work in vocational education, particularly those who construct career development programs for students at vocational high schools. Career development programs for vocational students must consider the suitability of students' areas of expertise so that students' confidence in their vocational abilities is higher. This helps them make career choice decisions when they graduate.

6. CONCLUSION

At vocational education, particularly in vocational schools, the career development of vocational students plays a crucial role. Studies on career construction have been highlighted because it is considered that building the strength of career plans for vocational students can help students strengthen their career plans. Therefore, a study to determine the factors forming career construction needs to be done. This study proves that career construction is directly influenced positively by career self-efficacy. Meanwhile, instructional quality and social support did not have a direct impact on career construction. Another conclusion is that the quality of students' educational and social support has a direct beneficial effect on their career self-efficacy. Finally, this study demonstrates that career self-efficacy serves as a mediator between instructional quality and social support in the career construction of civil engineering vocational high school students. The study's findings have important implications for vocational educators who want to construct career development or strengthening programs for their pupils.

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