

Career Maturity and Career Decision-Making Self-Efficacy as Predictors of Career Adaptability among Students in Foundation Program, Universiti Putra Malaysia

Nor Syazila Abdul Rahim¹, Wan Marzuki Wan Jaafar^{2*}, Nurazidawati Mohamad Arsad³

¹Faculty of Education, Universiti Putra Malaysia,
43400 Serdang, Selangor, Malaysia
syaziaralia@gmail.com
wanmarzuki@upm.edu.my
azidarsad@yahoo.com.my
*Corresponding Author

<https://doi.org/10.24191/ajue.v17i4.16181>

Received: 21 April 2021

Accepted: 30 August 2021

Date Published Online: 31 October 2021

Published: 31 October 2021

Abstract: This study aims to examine the key predictors between career maturity and career decision-making self-efficacy on career adaptability among students in the Foundation Studies for the Agricultural Science programme at Universiti Putra Malaysia (UPM). A quantitative research design using a questionnaire consists of career maturity, career decision-making self-efficacy and career adaptabilities was disseminated to the respondents. Using the cluster sampling method, a total of 329 students were involved in the study. The results indicate that these variables are significantly correlated and suggest that students who are able to have more career maturity or have more self-efficacy in their careers are more susceptible to self-adaptation. Employing hierarchical multiple regression analysis, it was discovered that career competency is the best predictor of career adaptability in relation to career maturity. Meanwhile, career goal-selection and career planning are the best predictors of career adaptability in relation to career decision-making self-efficacy. This study found that developing career maturity with a focus on students' career competency and career decision-making self-efficacy with an emphasis on career goal-selection and career planning in higher education plays an important role in enhancing their overall career adaptability and preparing them for future career success.

Keywords: Career adaptability, career maturity, decision-making, self-efficacy

1. Introduction

The rapid changes in the nature of employment structures have coincided with the advancement of technology and influenced the current generation. Technology can be the creator of new jobs, but can also be the destroyer that wipes out swaths of jobs (Mashelkar, 2018). Competitiveness between human and technology will affect the employment of low-level labour force, while increasing the employment of qualified labour force at the same time (Bal & Erkan, 2019). As a result, the labour market will become more competitive and ambiguous, resulting in increased unemployability, job insecurity, and forced career transitions for workers, particularly among young people (Di Maggio *et al.*, 2020). This then creates the necessity for the younger generation to be able to adapt to the new challenges of employment in order to survive in the future. Therefore, in order to prepare students with the work and barriers they will face in career advancement, they will be required to have the cognitive flexibility to aggressively and holistically deal with complex problems in their future career, rather than being bound by their field of study and examination alone (Yıldız-Akyol & Boyacı, 2020). One of the resolutions is by developing students' career adaptability to meet the challenges of today's global economy.

Career adaptability, as conceptualized by Savickas (1997), is a psychological construct that refers to the ability of an individual to use their resources in dealing with a task and transitioning into an occupation and unpredictable adjustment in work and working condition. Glavin (2013) stated that career adaptability reflects an individual's readiness to prepare resources for recurring career choices, transfer of jobs, and work traumas that have resulted from global post-corporate economy. Individuals with high levels of career adaptability, as explained by Savickas and Porfeli (2012), are able to become *concerned* with preparing their career task, have the *control* in becoming responsible towards their career development, display the *curiosity* to think about the self in various situations and roles by exploring possible future selves and collecting information regarding career opportunities, and have the confidence to face challenges in their future career and succeed in resolving any career-related problems.

According to Monteiro and Almeida (2015), fostering individuals with the four career adaptability resources during their studies in higher education will help students with their career development, particularly in adapting to environmental changes and transitioning from school-to-work. Based on the career construction theory, which was proposed by Savickas (2013), adaptation is necessary for individuals to negotiate changing contexts such as work transitions. Besides that, students will be able to gain confidence towards their futures, which will subsequently lead to life satisfaction (Cabras & Mondo, 2014) where they done mind spending extra time and effort for their task (Halim et al., 2021) and learn to deal with future career life difficulties (Hui et al., 2018). In terms of preparing for career advancement, factors that influence career adaptability have been studied numerous times. According to Joo et al. (2018) and Stead et al. (2021), one of the factors that have been thoroughly researched and can influence career adaptability is career self-efficacy. This is supported by Savickas et al. (2018), who stated that self-efficacy is an important factor in the model of career adaptation and situated between adaptability resources (career adaptability *subcomponents*) and adapting responses (refer to Rudolph et al. (2017): career planning, career exploration, occupational belief, and career decision-making). Rudolph et al. (2017) also pointed out that the origin country of the participants has been found to be an important moderator for measuring the relationship between career decision self-efficacy and career adaptability. Therefore, it is crucial to understand the influence of the career decision self-efficacy dimension on career adaptability in the local context, particularly in Malaysia.

Another factor that needs to be taken into account in this study is career maturity. According to Savickas (2002), attitude, belief, and competency in the career maturity model are fundamental dimensions towards career adaptability, and the main concept in career construction theory. Savickas (2002) added that career maturity occurs when the knowledge requirements in each stage of career development are magnificently achieved in line with age transition. Based on Super's career development lifespan theory (Super, 1990), university students at the age of 18 to 21 are in the career development stage of specialization, including moving from the selection of various career options to career selection. Hence, this research is significantly relevant for the student in the Foundation Studies since their age was at specialization career development stage. At this stage, students were lack of knowledge and information about the job or career, as well as failure to recognize one's own needs and abilities more deeply indicates a weakness in the level of maturity of an individual's career. Therefore, it is appropriate to identify the relationship and influence of career maturity on career adaptability.

Generally, many studies have been conducted to explore the predictors of career adaptability among employees and university students such as professional development-related features and psychological factors (Bocciardi et al., 2017), competencies and personality (AlKhomeiri & Khalid, 2020), and social support (Ghosh & Fouad, 2017). However, only a few researches have been done extensively in Malaysia, and these comprised of graduated university students. An example is the study on the contribution of personal factors (Anas & Hamzah, 2020; Yahya et al., 2019) and career decision self-efficacy (Hamzah et al., 2021). Meanwhile, instead of evaluating only general career adaptability, there is also a lack in the study on the identification of the influence of the key components of career maturity and career decision-making self-efficacy on the subcomponents of career adaptability in Malaysia.

Hence, the present study aims to examine the dimension of career maturity (attitude and competencies) and career decision-making self-efficacy (self-appraisal, occupational information, goal-selection, planning, and problem-solving) in predicting career adaptability resources (concern, control, curiosity, and confidence).

2. Literature Review

2.1 Career Maturity and Career Adaptability

Career maturity is described as an individual's ability to adjust to developmental task at a specific stage in their life; this ability includes both affective and cognitive elements (Super & Kidd, 1979). Individuals with a high level of career maturity during the exploration stage of life are more likely to choose a future career and to be satisfied once they reach the establishment stage of life, according to Crites (1976). It also enables them to prepare for making the right decision based on adequate and realistic information about the career choice that is appropriate for their age (Walker, 2010). Meanwhile, individuals who are unaware and unable to identify their own needs and capabilities in profundity have shown inadequacy in their career maturity, in addition to impacting their career adaptability when they encounter a real-life career environment. Individuals who are highly adaptive might be constructively dissatisfied with their work, as discovered by Rudolph et al. (2015). This applies especially to the current global labour market, where people who are more adaptable may not have to be as satisfied with their jobs because they know that they can swiftly move into another.

A previous study related to career maturity has indicated a positive relationship and is able to help to improve the ability of career adaptability and vice versa (Seifert, 1994; Tolentino et al., 2013). The curiosity and self-confidence dimensions of career adaptation have been found in previous studies to be positively associated with career maturity (Savickas & Porfeli, 2012). Savickas (2013) pointed out from his *career construction theory* that attitude and competency in the career maturity model are the basic dimensions towards the ability of career adaptability. Attitudes refer to the emotions or feelings of individuals when making career choices and venturing into the world of work. Competence, on the other hand, looks at the information and competencies possessed by an individual in relation to a career and how much planning skills are needed to make career decisions. As a consequence, career maturity makes a significant addition to Career Development Theory due to the fact that career development can occur concurrently with chronological age progression.

Anas and Hamzah (2020) suggested that attitude should be inculcated, especially in new graduates who are entry-level employees. The ability to adapt among employees will improve the quality of work in a new or changed environment. The findings from Dini Natasya and Ariani Wulansari (2019) indicated that a career attitude without limits has a positive and significant influence on career adaptation. This means that career attitudes can enhance the ability of career adaptability in individuals, and the broader a person is in being open-minded, the better his career adaptation will be. Besides that, Monteiro and Almeida (2015) mentioned that individuals who have more positive attitudes towards work transition with higher levels of control can be better prepared to deal with the tasks inherent to that challenge.

Career adaptability was predicted by career competences, according to Akkermans et al. (2018) and Safavi and Bouzari (2019). Akkermans et al. (2018) also added that career competency is interconnected with achieving life satisfaction. Therefore, employees in their early careers, particularly recent graduates who have invested in career competencies, have a greater chance of long-term career success (Blokker et al., 2019). However, it depends on the individual's proactive efforts (AlKhomeiri & Khalid, 2020).

2.2 Career Decision-Making Self-Efficacy and Career Adaptability

Self-efficacy can be defined as an individual's belief towards their ability to achieve goals; for instance, to perform a certain task or behaviour successfully and is postulated to influence behavioral choices, performance, and persistence (Bandura, 1978). Although self-efficacy theory has been numerously implemented in the particular context of career behaviours, Betz et al. (1996) have mentioned self-efficacy in career decision-making as one of the most widely known psychometric characteristics worth studying for career development from the process of making a career decision. Career decision-making self-efficacy (CDMSE), as described by Betz et al. (1996) and Betz and Hackett (2006), is an individual's ability to believe that they can successfully complete tasks necessary for making career

decisions. Bozgeyikli and Eroğlu (2009) also added that CDMSE is regarded as an individual's ability to manage and implement the actions required to achieve a set of performance goal.

Preparing students with CDMSE is important in successful school-to-work transition and adaptation (Kim et al., 2015; Pinguart et al., 2003). Savickas *et al.* (2018) emphasized that, by increasing individuals' self-efficacy, it will help them to succeed in future career developmental tasks and further fostering career adaptability. However, if the students have low self-efficacy, their performance will also decrease due to lack of self-belief, particularly their confidence, as well as mastery of knowledge and skills in the target career field. This has been pointed out by Boyd and Vozikis (2017) that self-efficacy will influence students' attitudes and intentions or tendencies that will ultimately change their behaviour, especially towards the process of career development. A study by Hamzah et al. (2021) has demonstrated that CDMSE has an impact on career decisions, achievements, as well as adjustment behaviours, all of which are essential for the development of career adaptability.

Previous studies related to CDMSE have shown that self-efficacy among students in higher education has a positive relationship with career adaptability (Duffy et al., 2015; Ebenehi et al., 2016; Guan et al., 2016; Işık et al., 2018; Shin et al., 2019). Besides that, self-efficacy has also been found to be the largest predictor of variance influence in career adaptability (Ebenehi et al., 2016; Karacan-ozdemir & Yerin Guneri, 2017). A meta analysis carried out by Rudolph *et al.* (2017) has found that career adaptability is positively related to CDMSE. Meanwhile, the meta analysis conducted by Stead *et al.* (2021) revealed that CDMSE is positively related to career adaptability resources, with control, concern, and curiosity having slightly higher relationships with CDMSE than confidence. Furthermore, a study by Bocciardi *et al.* (2017) indicated that the concern and curiosity dimensions of career adaptability are strongly predicted by career self-efficacy factors.

Santos *et al.* (2018) suggested that, in order to improve CDMSE, intervention that is central to career adaptability has to focus on the foundations for self-appraisal, goal-selection, career planning, problem-solving, and identification of occupational information. Zaini *et al.* (2021) added that, to nurture students' capabilities in career decision-making, universities should have proper planning, particularly in inculcating the dimensions of CDMSE in students' programmes or courses.

Teychenne *et al.* (2019) proposed that, in order to enhance career adaptability and improve graduate employability, career planning is the key integral skills that needs to be embedded into the university curriculum, since many students have a limited understanding of the relevant jobs in their field. In addition, to develop students' future career success and confidence in making career decision, they need to generate more accurate self-appraisal and gain occupational information more effectively (Xin *et al.*, 2020). Besides that, proactive career-decision advice should be given to the students who do not have a clear career goal or career goal-selection (Chuang *et al.*, 2020). Teychenne *et al.* (2019) again suggested that, to enhance students' career adaptability, additional strategies have to be introduced to develop students' ability in problem-solving, particularly in the process of finding solutions for complex issues. Based on the literature review, the current study suggests the following conceptual framework (see Fig. 1).

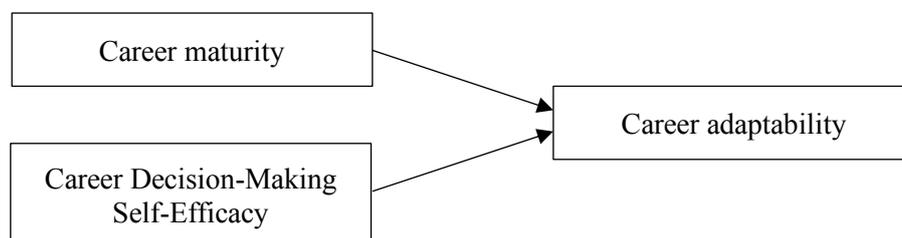


Fig 1. The conceptual framework

3. Methodology

This study employed a quantitative research design with survey method. Using an established questionnaire scales to collect the data, this study aims to explore the predictors of career adaptability, particularly career maturity and CDMSE as the key variables.

3.1 Respondents

The respondents of this study consisted of students from the Foundation Studies for Agricultural Science (ASPer) at Universiti Putra Malaysia (UPM). The total of ASPer students was $N = 988$. According to Krejcie and Morgan (1970), the minimum sample size required for $N = 1000$ population to attain a 95% confidence level is comparable to 278 respondents. In addition, Salkind (2012), suggested that the number of questionnaires should be raised from 40% to 50% in order to avoid insufficient data and meet the desired information needs. There are twenty classes in the ASPer programme, each with 40 to 50 students. Using the random sampling method with the fishbowl technique, eight classes were selected to meet the required sample size. Thus, a total of 400 questionnaires were distributed to the respondents. The response rate, together with the complete responses returned, was 329/400 (82.25%). From the data that have been collected, a total of 65% was female students, and the rest were male students.

3.2 Measures

3.2.1 Career Maturity Inventory-Revised (CMI-R)

The students' career maturity was measured using Career Maturity Inventory-Revised (CMI-R) by Crites and Savickas (1996). It was selected for use in this study because the content is relevant for postsecondary adults (Busacca & Taber, 2002). CMI-R consists of two components related to career maturity, which are Attitude Scale and Competence Test. Both components have 25 items, and the responses used a 5-point Likert agreement scale format that ranged from (1) = *strongly disagree* to (5) = *strongly agree*. Busacca and Taber (2002) reported that CMI-R has low internal consistency, as the total inventory is .61. However, other studies using this scale have stated that the coefficients is 0.89 (Birol & Kralp, 2010). Meanwhile, a pilot test has also shown that this instrument has a good internal coefficient ($\alpha = 0.83$). This means that, regardless of time, the reliability of the scale is strong and consistent.

3.2.2 Career Decision-Making Self-Efficacy (CDMSE)

Career decision-making self-efficacy (CDMSE) scale was originally developed by Taylor and Betz (1983). This instrument has been widely used for numerous studies and consists of 50 items. However, because the instrument is somewhat longer than what is desirable for the research purpose, especially in this context of study, the measurement of CDMSE in this current study therefore used the short form of CDSME developed by Betz et al. (1996). This particular instrument only has 25 items, and the content includes these five behaviours: (a) Self-Appraisal, (b) Occupational Information, (c) Goal-selection, (d) Planning, and (e) Problem-Solving. The responses were obtained using a 5-point confidence continuum that ranged from (1) = *no confidence at all* to (5) = *complete confidence*. The scale scores were computed by summing up the responses to each scale's items, and the total score was the sum of the five-scale scores. Betz et al. (1996) reported that the total scale value of Cronbach's alpha is 0.94. Previous studies (for example, Ebenehi et al., 2016; Guan et al., 2016) have also revealed that CDMSE has an internal coefficient of more than 0.9. A pilot study indicated that the instrument has a high reliability as well ($\alpha = 0.84$).

3.2.3 Career Adapt-Abilities Scale (CAAS)

Career Adapt-Abilities Scale (CAAS) was developed by Savickas and Porfeli (2012). This instrument is widely used to measure career adaptabilities and has been reconstructed and revalidated

with various versions of study (for example, Di Maggio *et al.*, 2015; Ryba *et al.*, 2017). CAAS consists of four adaptability resources, namely concern, control, curiosity, and confidence. A scale for managing occupational transitions, developmental tasks, and work traumas is included in these resources to promote self-regulation strategies. Each scale consists of six items. The scale responses used a 5-point strength format that ranged from (1) = *not strong* to (5) *strong*. Previous researches have shown that this instrument has a high reliability, with the value of Cronbach's alpha at more than 0.9 (Savickas & Porfeli, 2012; Zacher *et al.*, 2015). Findings from the pilot study reported that the instrument also has good and high reliability ($\alpha = 0.84$).

3.3 Procedure and Analysis

Prior to the pilot and field studies, an application for data collection permission was submitted to the Centre of Foundation Studies for Agricultural Science, UPM. Following the approval, the pilot study was conducted with 75 ASPer students from a class that would not be involved in the field study. The questionnaire with the three instrument measurements: CMI-R, CDMSE, and CAAS was then distributed to the students with the help of the class lecturer. The purpose of the pilot study is to investigate the validity and reliability of the instruments, as well as the relevance of the items utilised in the study. To assess the instruments' validity, an inter-rater technique was used, and the instrument's content was validated by three experts in psychology and counselling. Based on the higher proportion of expert validation agreement, this instrument was appropriate to employ in the study. Meanwhile, reliability analyses revealed that the instrument has good and strong internal consistency (values of around 0.83 and 0.84).

In order to analyse the data, the statistical software: SPSS Version 25 was employed. The variables' means (m), standard deviations (SD), and correlation coefficients were computed. The goal correlation coefficients is to determine the extent to which the variations in one factor are proportional to the variations in one or more other factors (Noah, 2002). Furthermore, correlation studies are carried out to determine the strength and direction of the association between the variables (Pallant, 2013). The subsequent analysis that was conducted in this study was hierarchical multiple regression. The purpose of this analysis is to predict the value of a dependent variable based on the values of two or more other independent variables (Tabachnick & Fidell, 2013). Apart from that, Pallant (2013) stated that hierarchical multiple regression is also used to investigate the prediction capacity of a set of independent variables against one dependent variable for a continuous measuring instrument. In order to perform the analysis in this study, a three-step hierarchical multiple regression (Model 1 to Model 3) with the "enter" method was conducted using the total measure of career adaptability, including its resources (namely concern, control, curiosity, and confidence), as the dependent variable. In analysing the predictors, Model 1 used only one of the categories of the demographic information, which is gender. Model 2 included the career maturity and its components (attitude and competency), while Model 3 included CDMSE and its components (self-appraisal, occupational information, goal-selection, planning, and problem-solving). The predictive power of each regression model (R^2 adjusted) and its incremental validity (ΔR^2) in explaining career adaptability measures was also calculated.

4. Results

Table 1 shows the results of the Pearson product-moment correlation between the components of career maturity and CDMSE towards career adaptability. The findings revealed that there is a significant ($r = 0.269$, $p < 0.01$) and positive relationship between career maturity and career adaptability in terms of competency. Similar findings were also revealed among all the components of CDMSE and career adaptability. The results have found a significantly strong and positive relationship between career adaptability and self-appraisal ($r = 0.525$, $p < 0.01$), occupational information ($r = 0.559$, $p < 0.01$), goal-selection ($r = 0.599$, $p < 0.01$), planning ($r = 0.688$, $p < 0.01$), and problem solving ($r = 0.538$, $p < 0.01$).

Table 1. Correlation between variables (n= 329)

	<i>m</i>	<i>SD</i>	CAAS, <i>r</i>
<i>CMI-R</i>			
Attitude	23.049	1.147	-0.021
Competency	19.380	2.442	.269**
<i>CDMSE</i>			
Self-Appraisal	18.845	2.917	.525**
Occupational Information	20.049	3.171	.559**
Goal Selection	19.869	2.950	.599**
Planning	19.505	3.415	.688**
Problem Solving	19.188	3.008	.538**

m mean, *SD* standard deviation, **correlation is significant at the 0.01 level (2-tailed).

The results of the hierarchical multiple regression analysis in Table 2 (See Model 3) indicate that the examined variables succeed in accounting for only 50% of the total variance of career adaptability. Based on these results, the best predictors in relation to career maturity is competency ($\beta = 0.616, p < 0.05$). Meanwhile, goal-selection ($\beta = 0.913, p < 0.05$) and planning are the best predictors related to CDMSE ($\beta = 2.473, p < 0.001$), and across all models, gender has been revealed to not have influence on career adaptability.

Table 2. Hierarchical multiple regression analysis for predicting career adaptability total score

Dependant variable	Model 1	Model 2	Model 3
Constant	97.813***	77.924***	21.878
Gender	-1.665	-2.613	-1.838
<i>CMI</i>			
Attitude		-.680	-.065
Competency		1.917***	.616*
<i>CDMSE</i>			
Self-Appraisal			-.189
Occupational Info.			.195
Goal Selection			.913*
Planning			2.473***
Problem Solving			.357
<i>R</i>	0.052	0.304	0.719
<i>R</i> ² (adjusted)	0.000	0.084	0.504
ΔR^2	0.003	0.090	0.424

Table 3 shows the results of the hierarchical multiple regression analysis with each of the career adaptability resources (concern, control, curiosity, and confidence). Overall (See Model 4), the variables explain 44.2% (concern), 40.1% (control), 39.1% (curiosity), and 39.2% (confidence) of the outcome's variance. For the predictors of concern resource, they are only explained by CDMSE in terms of planning dimension ($\beta = 0.638, p < 0.001$). The predictors for control resource are also explained by the dimensions of CDMSE, namely goal-selection ($\beta = 0.417, p < 0.001$) and planning ($\beta = 0.580, p < 0.001$). Meanwhile, the predictors for curiosity is explained by career maturity, namely competency ($\beta = 0.211, p < 0.05$) and CDMSE (planning) ($\beta = 0.607, p < 0.001$). The predictors for control resource is explained by the CDMSE dimension of goal-selection ($\beta = 0.236, p < 0.05$) and planning ($\beta = 0.647, p < 0.001$). Again, gender does not influence career adaptability across all models.

Table 3. Hierarchical multiple regression analysis for predicting career adaptability resources score

Dependant variable	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	Concern			Control		
Constant	23.985***	20.110***	5.845	24.137***	16.236**	1.488
Gender	-0.130	-0.370	-0.247	-0.330	-0.532	-0.343
<i>CMI</i>						
Attitude		-0.220	-0.084		0.004	0.182
Competency		0.482***	0.150		0.420***	0.102
<i>CDMSE</i>						
Self-Appraisal			-0.065			-0.167
Occupational Info.			.105			-0.083
Goal Selection			0.063			0.417***
Planning			0.638***			0.580***
Problem Solving			0.145			0.089
<i>R</i>	.014	.267	.665	.038	.243	.645
<i>R</i> ² (adjusted)	0.000	0.071	0.442	-0.002	0.050	0.401
ΔR^2	0.000	0.071	0.371	0.001	0.058	0.358
	Curiosity			Confidence		
Constant	25.146***	18.486***	5.025	24.544***	23.091***	9.492*
Gender	-0.765	-1.028*	-0.777	-0.440	-0.682	-0.471
<i>CMI</i>						
Attitude		-0.142	-0.007		-0.322	-0.169
Competency		0.536***	0.211*		0.479***	0.153
<i>CDMSE</i>						
Self-Appraisal			0.061			-0.018
Occupational Info.			-0.130			-0.087
Goal Selection			0.197			0.236*
Planning			0.607***			0.647***
Problem Solving			0.082			0.041
<i>R</i>	.085	.309	.637	.049	.277	.638
<i>R</i> ² (adjusted)	0.004	0.087	0.391	-0.001	0.068	0.392
ΔR^2	0.007	0.088	0.311	0.002	0.074	0.331

5. Discussion and Implications

This study aims to investigate career maturity and career decision-making self-efficacy key predictors towards the career adaptability of students from the Foundation Studies for Agricultural Science (ASPer) programme at Universiti Putra Malaysia (UPM). It has been found that career maturity has influence on career adaptability, which is consistent with the findings of Seifert (1994) and Tolentino *et al.* (2013). Meanwhile, career decision-making self-efficacy (CDMSE) has also been discovered to have a big impact on career adaptability. This finding is similar with the findings of Duffy *et al.* (2015), Ebenehi *et al.* (2016), Guan *et al.* (2016), Işık *et al.* (2018) and Shin *et al.* (2019). It is also in line with the findings of Ebenehi *et al.* (2016) and Karacan-Ozdemir (2019).

Additionally, a significant and positive association between career maturity (competency) and CDMSE towards career adaptability was discovered. This finding suggests that in order to build and strengthen students' career adaptability, educators and counsellors should put an emphasis on the development of students' career maturity and CDMSE factors. According to this result, students who demonstrate a high level of career maturity and CDMSE are more likely to adapt to the learning environment and have a more favourable attitude toward education and sustained employment.

Besides that, a significant and positive relationship was identified between career maturity (competency) and CDMSE towards career adaptability. This finding indicates that to train and enhance students' career adaptability, educators and counsellor should emphasize on development of students' career maturity and CDMSE factors in their program. Based on this result, students with a high level of career maturity have a probability to adapt to learning environment and being more positive towards education and sustainable employment.

The outcome of this study has shown that career competency has a significant influence in predicting career adaptability when looking into the career maturity dimension. Even though only one dimension in career maturity has significantly predicted career adaptability, this result is consistent with the development of the fundamental theory in career adaptability, which is based on the formation of the dimension in the career maturity model, one of which is career competency (Savickas, 1997, 2002). Preparing students with career competency will enable them to plan their careers ahead of time (Akkermans & Tims, 2017; AlKhomeiri & Khalid, 2020) and allow them to adapt to the rapid changes that occur during each industrialization revolution, particularly in the competitiveness between human and technology.

Aside from that, the dimension of CDMSE shows that career goal-selection and career planning have been identified as the key predictors of career adaptability. Students who believe in their career goal-selection see university and the course taken as a step in attaining their career goals and as a direction to achieve their career vision. However, students who do not have a clear career goal or career goal-selection need to be given a proactive career-decision advice, as suggested by Chuang *et al.* (2020). Accordingly, students who have higher CDMSE would find it easier to achieve their set goals (reflecting career adaptability). Similar with the study by Hamzah *et al.* (2021), efforts towards improving CDMSE among university students could significantly improve their career adaptability.

Furthermore, career planning, as one of the dimensions in CDMSE, is the strongest link and predictor of career adaptability. According to Teychenne *et al.* (2019), incorporating career planning into university curricula will help to improve students' career adaptability. At the same time, students will be well-prepared to set career goals and start planning for jobs that are relevant to their field.

When investigating the four main resources (concern, control, curiosity, and confidence) of career adaptability, we have found that the total variance explain of all the resources is only slightly different. However, the concern and control dimensions are strongly predicted by career maturity and CDMSE. This result is similar with the findings of Bocciardi *et al.* (2017), which have shown that concern dimension is the strongest variable predicted. However, their results contradict ours in terms of the control dimension. According to Duffy (2010), students may believe they are more adaptable because they feel in control of their lives on a broad level.

This study has several implications, most notably for career theory and career counselling practise. In terms of theoretical implications, both career maturity and CDMSE demonstrated a good correlation with career adaptability, particularly for Savickas's (2012) career construction theory. However, students' career adaptability is significantly influenced by competency factor in career maturity, and career goal selection, and career planning in CDMSE. As a result, to help students construct their future careers, higher education should put a priority on building students' career competency levels, career goal selection, and career planning when designing interventions, particularly for foundation programme students. Furthermore, as stated by Janib *et al.*, (2021) the design of intervention should be align with the individuals' competencies and capabilities.

Meanwhile, implaction for career counselling practice First, Hirschi *et al.* (2015) suggested that counsellors identify students with low adaptability. Then, in career guidance and counselling programmes, they should emphasise the dimensions that significantly influence career adaptability among university students, and it should be seriously implemented. Aside from that, support from university top management, particularly in promoting and providing funds for counseling units, can contribute to real-life work exposure for students, as well as in helping them make career decisions.

6. Limitations and Scope for Future Research

This study has only included students enrolled in the foundation programme at a single university. As a result, we are unable to generalise the population of higher education students. Therefore, participants from other universities, including colleges and private universities, should be

considered for future research. Besides that, the information of the participants involved in the present study lack demographics and social factors that could have influenced their career development. Further research that includes information about students' background needs to be conducted, as this may lead to different findings.

Another limitation in this study is that the data were obtained by utilising the self-report measure. Webster (2019) stated that validity concerns and the influence of risk of bias could be key potential of limitations when collecting data from self-reporting questionnaires. However, in order to reduce the risk of bias, the current study has employed a large sample size based on the appropriate sample size computation. Apart from that, to alleviate concerns about validity, the instrument was thoroughly validated by an expert before it was tested in the field. We proposed that in future studies, qualitative research should be undertaken with in-depth interviews. In addition, longitudinal studies should be conducted to provide insight into causes and effects, particularly on the relationship between career maturity of students and CDMSE with regards to their career adaptability.

Lastly, both dimensions in career maturity (career competency) and CDMSE (career goal-selection and career planning) could be further explored in future research, namely career adaptability resources (concern and control), in order to identify the best predictors or implementation in intervention for case studies or quasi-experimental for effective study purposes.

7. Conclusion

Career competency (a dimension of career maturity) and career goal-selection and career planning (dimensions of CDMSE) have been revealed to be the biggest predictors of career adaptability in this study. Students who exhibit these psychological factors may be more prepared to adjust to a new working environment and will assist them emotionally and physically in preparing for the transition from school to work. This is because the challenges in career development will gradually increase from the present towards the future, especially in competitiveness, coping with complex tasks, and managing work-related traumas. In addition, this study also contributes to the theoretical framework with regards to the influence of career maturity and CDMSE as factors that can enhance students' career adaptability. As a result, increasing students' career adaptability through these factors will enable them to gain the ability to be concerned about preparing for their professional tasks and to take control of their career development.

8. Co-Author Contribution

NSAR has made substantial contributions to the concept and design of this study by collecting data and preparing the first draft. WMWJ and OJ contributed to the conception and design of the study and approved the final version of the manuscript. NMA analysed and interpreted the data and helped in drafting and revising the manuscript.

9. Acknowledgements

The authors would like to thank all the students who participated in this study. Our gratitude also extends to the Publication and Citation Unit (PACU) of UPM for supporting the publication of this manuscript.

10. References

- Akkermans, J., Paradniké, K., Van der Heijden, B. I. J. M., & De Vos, A. (2018). The best of both worlds: The role of career adaptability and career competencies in students' well-being and performance. *Frontiers in Psychology*, 9(SEP), 1678. <https://doi.org/10.3389/fpsyg.2018.01678>
- Akkermans, J., & Tims, M. (2017). Crafting your career: How career competencies relate to career success via job crafting. *Applied Psychology*, 66(1), 168–195. <https://doi.org/10.1111/APPS.12082>
- AlKhemeiri, A. K., & Khalid, K. (2020). The role of career competencies and proactive personality in early-career employee career adaptability. *European Journal of Training and Development*.

- <https://doi.org/10.1108/EJTD-05-2020-0081>
- Anas, I., & Hamzah, S. R. (2020). Predicting career adaptability of fresh graduates through personal factors. *European Journal of Training and Development*. <https://doi.org/10.1108/EJTD-02-2020-0023>
- Bal, H. Ç., & Erkan, Ç. (2019). Industry 4.0 and competitiveness. *Procedia Computer Science*, 158, 625–631. <https://doi.org/10.1016/J.PROCS.2019.09.096>
- Bandura, A. (1978). Self-efficacy: Toward a unifying theory of behavioral change. *Advances in Behaviour Research and Therapy*, 1(4), 139–161. [https://doi.org/10.1016/0146-6402\(78\)90002-4](https://doi.org/10.1016/0146-6402(78)90002-4)
- Betz, N. E., & Hackett, G. (2006). Career Self-efficacy Theory: Back to the future. *Journal of Career Assessment*, 14(1), 3–11. <https://doi.org/10.1177/1069072705281347>
- Betz, N. E., Klein, K. L., & Taylor, K. M. (1996). Evaluation of a short form of the career decision-making self-efficacy scale. *Journal of Career Assessment*, 4(1), 47–57. <https://doi.org/10.1177/106907279600400103>
- Birol, C., & Kralp, Y. (2010). A comparative analysis of the career maturity level and career indecision of the first grade high school students. *Procedia Social and Behavioral Sciences*, 5, 2359–2365. <https://doi.org/10.1016/j.sbspro.2010.07.464>
- Blokker, R., Akkermans, J., Tims, M., Jansen, P., & Khapova, S. (2019). Building a sustainable start: The role of career competencies, career success, and career shocks in young professionals' employability. *Journal of Vocational Behavior*, 112, 172–184. <https://doi.org/10.1016/j.jvb.2019.02.013>
- Bocciardi, F., Caputo, A., Fregonese, C., Langher, V., & Sartori, R. (2017). Career adaptability as a strategic competence for career development: An exploratory study of its key predictors. *European Journal of Training and Development*, 41(1), 67–82. <https://doi.org/10.1108/EJTD-07-2016-0049>
- Boyd, N. G., & Vozikis, G. S. (2017). The influence of self-efficacy on the development of entrepreneurial intentions and actions: <https://doi.org/10.1177/104225879401800404>, 18(4), 63–77. <https://doi.org/10.1177/104225879401800404>
- Bozgeyikli, H., & Eroglu, S. (2009). Career decision making self-efficacy, career maturity and socioeconomic status with Turkish youth. *Education Sciences and Psychology*, 1(14), 15–24.
- Busacca, L. A., & Taber, B. J. (2002). The career maturity inventory-revised: A preliminary psychometric investigation. *Journal of Career Assessment*, 10(4), 441–455. <https://doi.org/10.1177/1069072702238406>
- Cabras, C., & Mondo, M. (2014). Future orientation as a mediator between career adaptability and life satisfaction in university students. *Journal of Career Development*, 45(6), 597–609. <https://doi.org/10.1177/0894845317727616>
- Chuang, N. K., Lee, P. C., & Kwok, L. (2020). Assisting students with career decision-making difficulties: Can career decision-making self-efficacy and career decision-making profile help? *Journal of Hospitality, Leisure, Sport & Tourism Education*, 26, 100235. <https://doi.org/10.1016/J.JHLSTE.2019.100235>
- Crites, J. O. (1976). A comprehensive model of career development in early adulthood. *Journal of Vocational Behavior*, 9(1), 105–118. [https://doi.org/10.1016/0001-8791\(76\)90012-9](https://doi.org/10.1016/0001-8791(76)90012-9)
- Crites, J. O., & Savickas, M. L. (1996). Revision of the career maturity inventory. *Revision of the Career Maturity Inventory*, 4(2), 131–138. <https://doi.org/10.1177/106907279600400202>
- Di Maggio, I., Ginevra, M. C., Laura, N., Ferrari, L., & Soresi, S. (2015). Career Adapt-Abilities Scale-Italian Form: Psychometric proprieties with Italian preadolescents. *Journal of Vocational Behavior*, 91, 46–53. <https://doi.org/10.1016/j.jvb.2015.08.001>
- Di Maggio, I., Ginevra, M. C., Santilli, S., Nota, L., & Soresi, S. (2020). The role of career adaptability, the tendency to consider systemic challenges to attain a sustainable development, and hope to improve investments in higher education. *Frontiers in Psychology*, 11(August), 1–10. <https://doi.org/10.3389/fpsyg.2020.01926>
- Dini Natasya, A., & Ariani Wulansari, N. (2019). Management analysis journal the effect of protean career attitudes and boundaryless career attitudes to career satisfaction's lecturers with the role of career adaptability as a mediator article information. *Management Analysis Journal*, 8(4), 397–405.
- Duffy, R. D. (2010). Sense of control and career adaptability among undergraduate students. *Journal*

- of *Career Assessment*, 18(4), 420–430. <https://doi.org/10.1177/1069072710374587>
- Duffy, R. D., Douglass, R. P., & Autin, K. L. (2015). Career adaptability and academic satisfaction: Examining work volition and self efficacy as mediators. *Journal of Vocational Behavior*, 90, 46–54. <https://doi.org/10.1016/J.JVB.2015.07.007>
- Ebenehi, A. S., Rashid, A. M., & Rahim Bakar, A. (2016). Predictors of career adaptability skill among higher education students in Nigeria. *International Journal for Research in Vocational Education and Training (IJRVET)*, 3, 212–229. <https://doi.org/10.13152/IJRVET.3.3.3>
- Ghosh, A., & Fouad, N. A. (2017). Career adaptability and social support among graduating college seniors. *Career Development Quarterly*, 65(3), 278–283. <https://doi.org/10.1002/cdq.12098>
- Glavin, K. W. (2013). Career adaptability. In M. L. Savickas (Ed.), *Ten Ideas That Changed Career Development: A Monograph to Celebrate the Centennial of the National Career Development Association (1913- 2013)* (p. 6). Oklahoma: Broken Arrow.
- Guan, M., Capezio, A., Restubog, S. L. D., Read, S., Lajom, J. A. L., & Li, M. (2016). The role of traditionality in the relationships among parental support, career decision-making self-efficacy and career adaptability. *Journal of Vocational Behavior*, 94, 114–123. <https://doi.org/10.1016/J.JVB.2016.02.018>
- Halim, N. A., Hassan, A., Basri, R., Yusof, A., & Ahrari, S. (2021). Job satisfaction as a mediator between leadership styles and organisational commitment of teachers in Malaysia. *Asian Journal of University Education*, 17(2), 61–71. <https://doi.org/10.24191/AJUE.V17I2.13398>
- Hamzah, S. R., Kai Le, K., & Siti Nur Syuhada, M. (2021). *The mediating role of career decision self-efficacy on the relationship of career emotional intelligence and self-esteem with career adaptability among university students*. <https://doi.org/10.1080/02673843.2021.1886952>
- Hirschi, A., Herrmann, A., & Keller, A. C. (2015). Career adaptivity, adaptability, and adapting: A conceptual and empirical investigation. *Journal of Vocational Behavior*, 87, 1–10. <https://doi.org/10.1016/J.JVB.2014.11.008>
- Hui, T., Yuen, M., & Chen, G. (2018). Career adaptability, self-esteem, and social support among Hong Kong University students. *The Career Development Quarterly*, 66(2), 94–106. <https://doi.org/10.1002/CDQ.12118>
- Işık, E., Yeğin, F., Koyuncu, S., Eser, A., Çömlekciler, F., & Yıldırım, K. (2018). Validation of the Career Adapt-Abilities Scale–Short Form across different age groups in the Turkish context. *International Journal for Educational and Vocational Guidance* 2018 18:3, 18(3), 297–314. <https://doi.org/10.1007/S10775-018-9362-9>
- Janib, J., Rasdi, R. M., Omar, Z., Alias, S. N., Zaremohzzabieh, Z., & Ahrari, S. (2021). The relationship between workload and performance of research university academics in Malaysia: The mediating effects of career commitment and job satisfaction. *Asian Journal of University Education*, 17(2), 85–99. <https://doi.org/10.24191/AJUE.V17I2.13394>
- Joo, Y. J., Park, S., & Park, S. Y. (2018). Influential factors of career adaptability for college students in engineering. <https://doi.org/10.5465/AMBPP.2018.10326abstract>, 2018(1), 10326. <https://doi.org/10.5465/AMBPP.2018.10326ABSTRACT>
- Karacan-Ozdemir, N. (2019). Associations between career adaptability and career decision-making difficulties among Turkish high school students. *International Journal for Educational and Vocational Guidance*, 19(3), 475–495. <https://doi.org/10.1007/s10775-019-09389-0>
- Karacan-ozdemir, N., & Yerin Guneri, O. (2017). The factors contribute to career adaptability of high-school students. In *Eurasian Journal of Educational Research* (Vol. 67). <https://doi.org/10.14689/ejer.2017.67.11>
- Kim, B., Lee, B. H., Ha, G., Kwon Lee, H., & Lee, S. M. (2015). Examining longitudinal relationships between dysfunctional career thoughts and Career Decision-Making Self-Efficacy in school-to-work transition. *Journal of Career Development*, 42(6), 511–523. <https://doi.org/10.1177/0894845315578903>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
- Mashelkar, R. A. (2018). Exponential Technology, Industry 4.0 and Future of Jobs in India: *Review of Market Integration*, 10(2), 138–157. <https://doi.org/10.1177/0974929218774408>
- Monteiro, S., & Almeida, L. S. (2015). The relation of career adaptability to work experience, extracurricular activities, and work transition in Portuguese graduate students. *Journal of*

- Vocational Behavior*, 91, 106–112. <https://doi.org/10.1016/J.JVB.2015.09.006>
- Noah, S. M. (2002). *Reka bentuk penyelidikan: Falsafah, teori & praktis*. Serdang: UPM Press.
- Pallant, J. (2013). *SPSS survival manual*. UK: McGraw-Hill.
- Pinquart, M., Juang, L. P., & Silbereisen, R. K. (2003). Self-efficacy and successful school-to-work transition: A longitudinal study. *Journal of Vocational Behavior*, 63(3), 329–346. [https://doi.org/10.1016/S0001-8791\(02\)00031-3](https://doi.org/10.1016/S0001-8791(02)00031-3)
- Rudolph, C. W., Clark, M. A., Jundt, D. K., & Baltes, B. B. (2015). Differential reactivity and the within-person job stressor–satisfaction relationship. *Stress and Health*, 32(5), 449–462. <https://doi.org/10.1002/SMI.2641>
- Rudolph, C. W., Lavigne, K. N., & Zacher, H. (2017). Career adaptability: A meta-analysis of relationships with measures of adaptivity, adapting responses, and adaptation results. *Journal of Vocational Behavior*, 98, 17–34. <https://doi.org/10.1016/J.JVB.2016.09.002>
- Ryba, T. V., Zhang, C.-Q., Huang, Z., & Aunola, K. (2017). Career Adapt-Abilities Scale – Dual Career Form (CAAS-DC): Psychometric properties and initial validation in high-school student-athletes. *Health Psychology and Behavioral Medicine*, 5(1), 85–100. <https://doi.org/10.1080/21642850.2016.1273113>
- Safavi, H. P., & Bouzari, M. (2019). The association of psychological capital, career adaptability and career competency among hotel frontline employees. *Tourism Management Perspectives*, 30, 65–74. <https://doi.org/10.1016/J.TMP.2019.02.001>
- Salkind, N. J. (2012). *Exploring Research* (8th ed.). New Jersey: Pearson.
- Santos, A., Wang, W., & Lewis, J. (2018). Emotional intelligence and career decision-making difficulties: The mediating role of career decision self-efficacy. *Journal of Vocational Behavior*, 107, 295–309. <https://doi.org/10.1016/J.JVB.2018.05.008>
- Savickas, M. L. (1997). Career adaptability: An integrative construct for life-span, life-space theory. *The Career Development Quarterly*, 45(3), 247–259. <https://doi.org/10.1002/J.2161-0045.1997.TB00469.X>
- Savickas, M. L. (2002). Career Construction: A Developmental Theory of Vocational Behavior. In D. Brown (Ed.), *Career Choice and Development* (4th ed., pp. 149–205). San Francisco, CA: Jossey-Bass.
- Savickas, M. L. (2013). Career Construction Theory and Practice. In S. D. Brown & R. W. Lent (Eds.), *Praise for Career Development and Counseling: Putting Theory and Research to Work* (pp. 147–186). USA: John Wiley & Sons, Inc.
- Savickas, M. L., & Porfeli, E. J. (2012). Career Adapt-Abilities Scale: Construction, reliability, and measurement equivalence across 13 countries. *Journal of Vocational Behavior*, 80(3), 661–673. <https://doi.org/10.1016/j.jvb.2012.01.011>
- Savickas, M. L., Porfeli, E. J., Hilton, T. L., & Savickas, S. (2018). The student career construction inventory. *Journal of Vocational Behavior*, 106, 138–152. <https://doi.org/10.1016/J.JVB.2018.01.009>
- Seifert, K. H. (1994). Improving prediction of career adjustment with measures of career development. *The Career Development Quarterly*, 42(4), 353–366. <https://doi.org/10.1002/J.2161-0045.1994.TB00518.X>
- Shin, Y.-J., Lee, E. S., & Seo, Y. (2019). Does traditional stereotyping of career as male affect college women’s, but not college men’s, career decision self-efficacy and ultimately their career adaptability? *Sex Roles*, 81(1), 74–86. <https://doi.org/10.1007/S11199-018-0976-7>
- Stead, G. B., LaVeck, L. M., & Rúa, S. M. H. (2021). Career adaptability and career decision self-efficacy: Meta-analysis. *Journal of Career Development*, 1–14. <https://doi.org/10.1177/08948453211012477>
- Super, D. E. (1990). A life-span, life-space approach to career development. In *Career choice and development: Applying contemporary theories to practice* (2nd ed., pp. 197–261). San Fransisco, CA: Jossey-Bass.
- Super, D. E., & Kidd, J. M. (1979). Vocational maturity in adulthood: Toward turning a model into a measure. *Journal of Vocational Behavior*, 14(3), 255–270. [https://doi.org/10.1016/0001-8791\(79\)90054-X](https://doi.org/10.1016/0001-8791(79)90054-X)
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (7th ed.). Boston, MA: Pearson.
- Taylor, K. M., & Betz, N. E. (1983). Applications of self-efficacy theory to the understanding and

- treatment of career indecision. *Journal of Vocational Behavior*, 22(1), 63–81. [https://doi.org/10.1016/0001-8791\(83\)90006-4](https://doi.org/10.1016/0001-8791(83)90006-4)
- Teychenne, M., Parker, K., Teychenne, D., Sahlqvist, S., Macfarlane, S., & Costigan, S. (2019). A pre-post evaluation of an online career planning module on university students' career adaptability. *Journal of Teaching and Learning for Graduate Employability*, 10(1).
- Tolentino, L. R., Garcia, P. R. J. M., Restubog, S. L. D., Bordia, P., & Tang, R. L. (2013). Validation of the Career Adapt-Abilities Scale and an examination of a model of career adaptation in the Philippine context. *Journal of Vocational Behavior*, 83(3), 410–418. <https://doi.org/10.1016/J.JVB.2013.06.013>
- Walker, Q. D. (2010). *An investigation of the relationship between career maturity, career decision self-efficacy, and self-advocacy of college students with and without disabilities*. [Unpublished doctoral dissertation]. University of Iowa.
- Webster, J. D. (2019). Self-report wisdom measures. In R. J. Sternberg & Judith Glück (Eds.), *The Cambridge Handbook of Wisdom* (pp. 297–320). UK: Cambridge University Press.
- Xin, L., Zhou, W., Li, M., & Tang, F. (2020). Career success criteria clarity as a predictor of employment outcomes. *Frontiers in Psychology*, 0, 540. <https://doi.org/10.3389/FPSYG.2020.00540>
- Yahya, K. K., Tan, F. Y., Johari, J., & Fawehinmi, O. (2019). Career adaptability among undergraduate students: Do self-esteem and proactive personalities play a role? *Proceedings of the Second International Conference on the Future of ASEAN (ICoFA) 2017 - Volume 1*, 61–72. https://doi.org/10.1007/978-981-10-8730-1_7
- Yıldız-Akyol, E., & Boyacı, M. (2020). Cognitive flexibility and positivity as predictors of career future in university students. *Turkish Psychological Counseling and Guidance Journal*, 10(57), 297–320.
- Zacher, H., Ambiel, R. A. M., & Noronha, A. P. P. (2015). Career adaptability and career entrenchment. *Journal of Vocational Behavior*, 88(1), 164–173. <https://doi.org/10.1016/j.jvb.2015.03.006>
- Zaini, S. N. M., Rami, A. A. M., Arsad, N. M., & Anuar, M. A. M. (2021). Relationship of academic performance and academic self-concept with career decision-making among UPM undergraduate students. *Asian Journal of University Education*, 17(2), 50–61. <https://doi.org/10.24191/AJUE.V17I2.13403>