



## A STUDY OF THE RELATIONSHIPS AMONG PERCEIVED SOCIAL SUPPORT, SELF-EFFICACY, AND SELF- DIRECTED LEARNING CAPABILITY

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### Abstract

*This study was conducted to investigate the relationship between social support and self-directed learning capability and to verify the self-efficacy in mediating social support and self-directed learning capability. This study took undergraduate students from Z University in Guangdong Province, China as the subjects. The results of the quantitative study showed that (1) family support, peer support and, teacher support have significant positive effects on self-assessment, self-planning and, seeking learning resources, respectively. (2) self-efficacy has a fully mediating effect between family support and the relationship between self-assessment, self-planning, and seeking learning resources, respectively. (3) self-efficacy has a partially mediating effect between peer support and the relationships of self-assessment, self-planning, and seeking learning resources. (4) self-efficacy has a partially mediating effect between teacher support and self-assessment, and seeking learning resources, respectively; and a fully mediating effect between teacher support and self-planning.*

*Keywords: Social support, self-efficacy, learning resources, self-directed leaning capability*

## INTRODUCTION

In the study of university, individual students are often faced with problems at various levels, such as academic studies, interpersonal relationships, campus life, and emotions, which may cause individuals to develop a physical and mental imbalance, and may have a negative impact on subsequent study attitudes and behaviors in the case of high stress and poor psychological adaptation. Among these factors affecting psychological adjustment, social support is one of the important factors that cannot be ignored. Many studies have proven that social support has a positive effect on psychological adjustment. When an individual student needs assistance in times of stress or difficulty, it is important to have the support of significant others in one's social network, such as family, classmates and, teachers. Whether it is material assistance, psychological support or, providing information and advice on adapting to life and solving learning problems, it can relieve stress, enhance physical and mental health and strengthen the ability to adapt to the environment for individuals (Tu, 2020).

And then the learning of professional knowledge and life skills of college students is no longer the passive learning mode of high school, which is dominated by school and teachers and instills knowledge in one way, but the self-directed learning mode, which is learner-centered. In other words, in order to obtain learning outcomes or accomplish academic goals, individual college students must have the ability to understand their own learning needs, develop learning plans and goals based on their needs, and seek learning resources (Huang, 2017), and whether these abilities can be developed through different sources of social support is the focus of this study.

Furthermore, social cognitive theory reveals that individuals have a self-regulation mechanism, and perceived self-efficacy is the core element of this mechanism, which influences individuals' motivation and behavior (Bandura, 1982). At the same time, self-efficacy is dynamic in nature, and individuals' evaluations and judgments of self-efficacy change as they acquire new information and experiences (Torkzadeh & Van Dyke, 2001). Because self-efficacy is influenced by the interaction between the individual and the environment (Bandura, 1986), the level of substantive or psychological support provided by significant others can affect the changes in the individual's sense-making continuously, which may result in cognitive adjustments that affect subsequent learning attitudes and behaviors.

Based on the above discussion, this study will use social support as the main axis to explore the relationship with self-directed learning capability, and use self-efficacy as a mediating variable to gain a more comprehensive understanding of the development and impacts of the process of building self-directed learning ability from social support.

## **THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT**

### **Social Support**

Social support refers to the process and outcome of formal or informal support and assistance in interpersonal relationships through the interaction of interpersonal networks in the social environment in which individuals live (Gottlieb & Bergen, 2010; Chung, 2020). The social network theory considers that social support must be transmitted or exchanged through social networks. In other words, the social network is the bridge of social support (Tu, 2020), and social support is the interpersonal support and assistance that an individual receives in the social network. The sources of social support are quite diverse. In the learning tasks of college students, they interact dynamically with different members or partners in their social networks, among which, family, peers/classmates and, teachers are three important sources of social support.

In addition, social support is a multidimensional construct. There are different concepts proposed by researchers regarding the types of social support, but they can be broadly categorized into three main groups: (1) emotional support: convey messages of emotional care, such as concern, understanding, encouragement, or empathy (Taylor et al., 2004); (2) informational support: providing information in the form of recommendations, suggestions, or knowledge that can help solve problems (Dupont, Galand, & Nils, 2015); and (3) instrumental support: the provision of practical support in the form of money, materials, or labor (Chung, 2020).

As discussed above, the function of social support is to provide multiple types of support through different sources of social support, so that individuals can perceive the assistance of external resources to alleviate physical and psychological stress, and to improve physical and mental health and enhance the ability to adapt to the environment (Tu, 2020).

### **Self-directed Learning Capability**

Self-directed learning (SDL) is the learning process in which an individual triggers self-empowerment to achieve self-practice. Specifically, self-directed learning is the capability of individuals to take the initiative to learn, plan their own learning process, take responsibility for their own education, and be adept at using resources to accomplish their learning goals (Hsieh, 2019). And this process is reflected in the behavior of college students who are able to take the initiative to learn what they set out to achieve their learning goals by knowing themselves and by diagnosing their learning needs. In particular, unlike passive learning in high school where knowledge is passed on from teacher to teacher, college students must explore and diagnose their own learning needs to develop their own learning plans and learning activities and make

good use of various learning resources in order to achieve their learning goals. In such learning situations, the establishment and strengthening of self-directed learning skills is an essential element.

However, to build the capability of self-directed learning, in addition to being influenced by individual personality traits, motivation, and learning mindset, external sources of motivation are also important to motivate learners to be independently motivated, highly curious, and to accept challenges, and to have a strong desire to learn (Knowles, 1975). For example, the trainer/instructor makes the learner perceive that the content will help him/her to solve problems and gain the knowledge and skills required and that the helper understands his/her learning needs and can effectively help him/her to achieve his/her learning goals. In addition, educators have a responsibility to assist learners in developing their potential for self-directed learning by building friendly relationships within the group (Williamson, 2007).

Based on the concept of self-directed learning as a process of learning and developing competencies, this study distinguishes three levels of self-directed learning capability based on Huang's (2017) concept: (1) self-assessment: the ability of individuals to actively diagnose or understand their own learning needs; (2) self-planning: the ability to plan, select learning strategies, and set learning goals based on learning needs. (3) seeking learning resources: the ability to seek human resources such as teachers, peers, relatives, and friends, or material resources such as tools, ways, and environments in the learning process.

In summary, this study will examine whether the perceived social support from different sources has an impact on the establishment of self-directed learning capability of college students when they are in the process of learning.

### **Self-efficacy**

The social cognitive theory indicates that individuals have an internal mechanism of self-regulation, and the performance of perceived self-efficacy is the core factor of self-regulation (Bandura, 1982). Self-efficacy refers to the subjective evaluation of an individual's ability to accomplish a certain task, while this research applies the concept of self-efficacy to the field of learning and refers to an individual's subjective beliefs about whether he or she can achieve a certain level of academic learning. This belief is a subjective evaluation of a student's expected performance and ability in academic learning, which affects his or her motivation and behavior (e.g., Busch, 1995).

There are four main sources of self-efficacy (Taggar & Seijts, 2003): (1) Experience of success: this is the most important factor influencing self-efficacy, and if self-efficacy is based on continuous experience of success, it will strengthen one's perception of self-efficacy;

conversely, repeated experiences of failure will reduce self-efficacy. (2) Vicarious learning: from observing others' successful behaviors, one builds a sense of self-efficacy that one can also perform similar behaviors, and when one observes the failure of others despite many efforts, one's evaluation of self-efficacy decreases, and the efforts are reduced. (3) Social or verbal persuasion: important others give positive feedback or encouragement to individuals to convince them that they have the ability to achieve the goals they want to pursue so that they are willing to work harder to face difficulties and improve their self-efficacy, but if they do not have great trust in what the persuader says, they may reduce their self-efficacy. (4) Physiological or psychological arousal: information generated by emotional and physiological arousal can influence the judgment of self-efficacy. People sometimes rely on physical and emotional states to assess their abilities and their capabilities, and when individuals are in a state of anxiety and stress, it often causes people to doubt their abilities. The emotional state when faced with a fearful situation usually reduces the individual's performance level and affects self-efficacy.

Although these four elements affect the level of self-efficacy, it is the individual's cognitive assessment and integration of these four sources that ultimately determines self-efficacy and can be used to judge personal effectiveness.

### **The relationship between perceived social support and self-directed learning ability**

As mentioned above, social support is embodied in the different forms of support and assistance received through interpersonal interactions within the social network in which an individual is involved to enhance the ability to adapt to the environment. According to Liang et al. (2011), social support can act as enthusiastic feedback that can help a person feel better even if it does not directly help the person to solve the problem. Dupont et al. (2015) also argue that social support should be considered as a valuable resource to cope with stress and enable college students to meet the demands of school. Many scholars believe that social support is a key factor in promoting learning and persistence. Their findings show that students tend to show greater motivation and achieve better academic performance when they perceive support from peers, family, institutions, and teachers (Fass & Tubman, 2002; Feldman, 2007; Mattanah, et al., 2011; Robbins, et al., 2009).

Based on these perspectives, this study expected that different social support sources would have positive effects on college students' self-directed learning capabilities. For example, a supportive family, in which students perceive that they are allowed to actively participate and explore to gain more learning experiences (Dupont et al., 2015), should have a positive effect on their self-directed learning capability. Secondly, when individuals perceive that their

classmates are willing to share their experiences in academic learning and life adjustment and to provide learning methods and care, it should help them to improve their ability to plan their learning activities. In terms of teachers, when students personally perceive that their teachers are well informed about their learning problems and can provide information and advice about learning and emotional support, it should help students in understanding their learning needs, clarifying their learning goals, and how to access learning resources. Therefore, this study proposes the following hypotheses.

H1: Perceived family support has a significant positive effect on self-direct learning capability.

H1-1: Perceived family support has a significant positive effect on self-assessment capability.

H1-2: Perceived family support has a significant positive effect on self-planning capability.

H1-3: Perceived family support has a significant positive effect on learning resources seeking capability.

H2: Perceived peer support has a significant positive effect on self-direct learning capability.

H2-1: Perceived peer support has a significant positive effect on self-assessment capability.

H2-2: Perceived peer support has a significant positive effect on self-planning capability.

H2-3: Perceived peer support has a significant positive effect on learning resources seeking capability.

H3: Perceived teacher support has a significant positive effect on self-direct learning capability.

H3-1: Perceived teacher support has a significant positive effect on self-assessment capability.

H3-2: Perceived teacher support has a significant positive effect on self-planning capability.

H3-3: Perceived teacher support has a significant positive effect on learning resources seeking capability.

### **Mediating effects of self-efficacy**

Many studies have shown that perceived family support enhances students' perceived ability (e.g., Mattanah et al., 2011), and such perceived ability facilitates their engagement in academic tasks (Reynolds & Clements, 2005) and academic performance during their undergraduate studies (Cutrona et al., 1994). In other words, social support may first influence individuals' perceptions and then their attitudes or outcomes.

Social cognitive theory suggests that self-efficacy is influenced by how individuals interpret relevant information (Bandura, 1986). Because self-efficacy is a student's subjective evaluation and beliefs about whether he or she is able to achieve academic goals. When individuals are aware that their families, teachers, or peers are supportive and helpful in their learning, the perceptions they generate will be a better guide to their learning behaviors than the actual support and assistance from these sources of social support. Fast

et al. (2010) stated that the degree to which students perceive their learning environment to be caring has a significant impact on self-efficacy. Murdock & Miller (2003) also concluded that students who feel cared for by their teachers in the learning environment are more likely to perceive themselves as academically competent and to set higher learning goals for themselves. Students who have good learning and interactive relationships with each other during the learning process may also motivate and increase confidence among peers to reach their learning goals. And a supportive family provides individuals with a sense of stability in terms of emotional support and more confidence in achieving their specific learning tasks.

The social cognitive theory suggested that self-efficacy has a strong influence on achievement behavior (Bandura, 1986). Fast et al. (2010) considered that individuals with high self-efficacy have higher ambitions, a stronger commitment to goals, and the ability to recover from setbacks more quickly than those with low self-efficacy. Many studies also indicate that individuals with high self-efficacy are willing to put in more effort and persist in overcoming difficulties and setbacks for a longer period of time than those with low self-efficacy to achieve the goals of the task (Bandura, 1986; Gist & Mitchell, 1992). Many studies have also shown that students who perceive themselves to be competent invest more effort in learning activities and perform better (De Clercq, et al, 2013). Related empirical studies also indicate that personal self-efficacy affects the ability to acquire and transfer knowledge and skills in contexts of increased task complexity and difficulty, and predicts future performance better than past performance (Kozlowski et al., 2001).

If we look at the four elements that determine self-efficacy as mentioned above, when families, peers, and teachers consistently provide students with personal learning successes through emotional, informational, or instrumental support, it should strengthen their self-confidence in reaching their learning goals, which in turn helps to enhance their self-directed learning capability. Second, for students who do not perform well, sharing learning methods or strategies with peers, discussing and communicating with each other or observing the successes of their peers, can trigger similar behaviors in themselves and enhance their sense of self-efficacy, which can also help to strengthen their self-directed learning capability. Furthermore, if teachers understand students' learning problems and assist them in the learning process, give positive verbal feedback or encouragement to students' learning performance, and provide relevant learning resources so that students believe that they have the ability to achieve their learning goals and are willing to overcome obstacles, it will also help them to build their self-efficacy and improve their self-directed learning ability.

In light of the above discussion, the following hypotheses are proposed in this study.

H4: Self-efficacy mediates the relationship between perceived family support and self-directed learning capability.

H4-1: Self-efficacy mediates the relationship between perceived family support and self-assessment capability.

H4-2: Self-efficacy mediates the relationship between perceived family support and self-planning capability.

H4-3: Self-efficacy mediates the relationship between perceived family support and learning resources seeking capability.

H5: Self-efficacy mediates the relationship between perceived peer support and self-directed learning capability.

H5-1: Self-efficacy mediates the relationship between perceived peer support and self-assessment capability.

H5-2: Self-efficacy mediates the relationship between perceived peer support and self-planning capability.

H5-3: Self-efficacy mediates the relationship between perceived peer support and learning resources seeking capability.

H6: Self-efficacy mediates the relationship between perceived teacher support and self-directed learning capability.

H6-1: Self-efficacy mediates the relationship between perceived teacher support and self-assessment capability.

H6-2: Self-efficacy mediates the relationship between perceived teacher support and self-planning ability.

H6-3: Self-efficacy mediates the relationship between perceived teacher support and learning resources seeking capability.

## **RESEARCH METHOD**

This study adopted a descriptive research design.

### **Participants and procedures**

This study used convenience sampling technique due to time and cost considerations. 675 questionnaires were distributed to undergraduate students at Z University in Guangdong Province, China, and 505 questionnaires were collected, with a recovery rate of 74.81%. After deducting 23 incomplete questionnaires and outliers in questionnaire data, there were 482 valid samples, with an effective recovery rate of 71.41%. Among all the respondents, 56.6% were



males and 43.4% were females. In terms of grade, senior students accounted for 42.1%, followed by juniors accounting for 33.6%. In terms of the department, students of science and engineering accounted for 68.0%, followed by students of liberal arts accounting for 22.6%; in terms of place of origin, students from urban areas accounted for 54.1%.

### **Common method variance Analysis**

Considering that the respondents of all the questionnaires in this study were all students, it is prone to the occurrence of common method variance (CMV) due to the single source of respondents. Therefore, Haman's single-factor post hoc analysis (Podsakoff, et al., 2003) was further conducted to detect whether CMV is likely to happen. All the items from every construct were entered into principal component factor analysis, and checked the unrotated factor solution, and examined to assess the number of factors that could cause the variance in the variables (Tehseen, et al., 2017). The analysis result shows that 9 factors were extracted through unrotated principal component factor analysis and the explained variance of the first factor accounts for 34.06% (< 50%), this means that CMV is not a serious problem in the study (Mattila & Enz, 2002).

### **Measures**

In this study, Likert's five-point scale was used to measure the items of each scale from 1 (strongly disagree) to 5 (strongly agree). And since all the items on the scale were positive, the higher the score, the higher the level of agreement. Secondly, the reliability of each dimensional question will be tested by Cronbach's alpha coefficient. Nunnally & Bernstein (1994) concluded that when the value of Cronbach's alpha coefficient of a survey about organizational research exceeds 0.7, then the items of each dimension have good internal consistency reliabilities.

Social support was measured using the scale developed by Deerter-Schmelz & Ramsey (1997). Based on the fact that the subjects of this study were college students, the original designators (supervisor support, colleague support) were converted to teacher support and peer support, with a total of 18 items divided into three dimensions: (1) Family support: 6 items in total, (e.g., family would listen to my study problems) ( $\alpha=0.82$ ). (2) Peer support: 6 items in total, (e.g., my classmates will care about my study problems) ( $\alpha=0.84$ ). (3) Teacher support: 6 items in total, (e.g., teachers will give me some substantial help when I am under pressure to study) ( $\alpha=0.83$ ).

Self-efficacy was measured using a scale developed by Chen, Gully & Eden (2001) with 8 items and a single dimension, (e.g., I am capable of reaching all the goals I set for myself),  $\alpha=0.87$ .

Self-directed learning capability was measured using a scale developed by Huang (2017), with 14 items divided into three dimensions: (1) Self-assessment capability: 5 items in total, (e.g., I know what I want to learn) ( $\alpha=0.84$ ). (2) Self-planning capability: 5 items in total, (e.g., I can implement learning strategies with skill and initiative) ( $\alpha=0.85$ ). (3) Learning resources seeking capability: 4 items in total, (e.g., I know what human or material resources are needed to achieve learning goals) ( $\alpha=0.82$ ).

## RESULTS

### Correlation, reliability, and validity analysis

First, table 1 shows the correlation between the variables, which shows that all variables have a positive correlation with each other ( $r = 0.533-0.685$ ,  $p < 0.01$ ). Next, the validity and reliability of all constructed items were measured using confirmatory factor analysis (CFA). As shown in Table 1, (1) Cronbach's  $\alpha$  values all exceed 0.7, indicating that there is good internal consistency among the items of each dimension (Nunnally & Bernstein, 1994). (2) The construct reliability (CR) is between 0.81 and 0.89 ( $> 0.6$ ). (3) In terms of the measurement of convergent validity, the average variance extracted (AVE) of each latent construct is greater than 0.5 (Fornell & Larcker, 1981). (4) In terms of the measurement of discriminant validity, the AVE for each latent construct exceeds the respective squared correlation (Fornell & Larcker, 1981). The data above-mentioned all exceed the recommended value, indicating that the measurement model in this study has good reliability, discriminant validity, and convergent validity.

Table 1. Correlations, reliability, and validity for the study variables

Variables	$\alpha$	CR	AVE	1.	2.	3.	4.	5.	6.	7.
1. FS	0.82	0.85	0.52	<b>0.73</b>						
2. CS	0.84	0.84	0.51	0.68**	<b>0.71</b>					
3. TS	0.83	0.84	0.51	0.66**	0.65**	<b>0.71</b>				
4. SE	0.85	0.89	0.50	0.64**	0.62**	0.63**	<b>0.71</b>			
5. SAC	0.84	0.85	0.52	0.58**	0.62**	0.64**	0.65**	<b>0.72</b>		
6. SPC	0.85	0.86	0.56	0.54**	0.61**	0.59**	0.66**	0.66**	<b>0.75</b>	
7. LRSC	0.82	0.81	0.51	0.53**	0.59**	0.61**	0.62**	0.62**	0.59**	<b>0.72</b>

Note:  $\alpha$ = Cronbach's  $\alpha$ ; FS= family support; CS= classmate support; TS= teacher support; SE= self-efficacy; SAC= self-assessment capability; SP= self-planning capability; LRSC= learning resources seeking capability; C.R.= construct reliability; AVE= average variance extracted; The square root of AVE is displayed in bold on the diagonal of the matrix. \*\* $p < 0.01$

## Testing of hypotheses

### ***Relationship between social support and self-directed learning capability***

In this study, regression analysis was used to verify the hypothesis of the influential relationship between variables, and gender, department and, birthplace were used as control variables to enhance the stability of the study results. As shown in Table 2, first, this study tested the hypothesis of social support on self-directed learning capability by multiple regression method. As shown in Table 2, family support, peer support, and teacher support has a significant positive impact on self-assessment capability ( $\beta = 0.168, p < .001$ ;  $\beta = 0.218, p < .001$ ;  $\beta = 0.358, p < .001$ ), self-planning capability ( $\beta = 0.150, p < .05$ ;  $\beta = 0.327, p < .001$ ;  $\beta = 0.262, p < 0.001$ ) and learning resources seeking capability ( $\beta = 0.166, p < 0.05$ ;  $\beta = 0.246, p < .001$ ;  $\beta = 0.352, p < 0.001$ ), respectively. Therefore, the H1-1~H1-3, H2-1~H2-3, H3-1~3-3 were supported.

Table 2. Multiple Regression Results for Social Support Predicting Self-directed Learning Capability

DV → IV ↓	Self-directed Learning Capability		
	SAC	SPC	LRSC
Gender	0.01	0.00	0.01
Department	-0.05	-0.05	-0.07
Birth Place	0.00	- 0.02	0.00
FS	0.22***	0.16*	0.15*
CS	0.21***	0.34***	0.23***
TS	0.28***	0.20***	0.34***
<i>F</i>	53.87***	54.10***	63.55***
<i>P</i>	0.00	0.00	0.00
<i>R</i> <sup>2</sup>	0.41	0.41	0.45

Note: \*  $P < 0.05$  \*\*\*  $P < 0.001$

### ***Mediating effects of self-efficacy***

Next, this study examined whether the mediating effect of self-efficacy was valid based on Baron & Kenny's (1986) confirming condition for mediating effects. From the research framework of this study, complete mediation is present when social support no longer influences self-directed learning capability after the mediator (self-efficacy) has been controlled and all of

the above conditions are met. Partial mediation occurs when social support's influence on self-directed learning capability is reduced after the mediator is controlled.

This study adopted the hierarchical regression method, as shown in Table 3, showed that the regression coefficients of family support on self-assessment, self-planning, and seeking learning resources changed from significant to non-significant after the introduction of self-efficacy in the research model ( $\beta=0.22$ ,  $p<0.001$   $\beta=0.08$ ,  $p > 0.05$ ;  $\beta=0.16$ ,  $p<0.05$   $\beta=0.02$ ,  $p > 0.05$ ;  $\beta=0.15$ ,  $p<0.05$   $\beta=0.03$ ,  $p > 0.05$ ), indicating that self-efficacy has a fully mediating effect. Second, the regression coefficients of peer support on self-assessment capability, self-planning capability, and learning resources seeking capability, respectively, decreased but remained significant ( $\beta=0.21$ ,  $p<0.001$   $\beta=0.13$ ,  $p<0.05$ ;  $\beta=0.34$ ,  $p<0.001$   $\beta=0.26$ ,  $p<0.001$ ;  $\beta=0.23$ ,  $p<0.001$   $\beta=0.16$ ,  $p<0.05$ ), indicating a partial mediating effect of self-efficacy in the relationship between the three dimensions of peer support and self-directed learning ability. Finally, the study model had a partial mediating effect between self-efficacy after controlling the self-efficacy in the relationship between teacher support and self-assessment, and seeking learning resources, respectively ( $\beta=0.28$ ,  $p<0.001$   $\beta=0.17$   $p<0.01$ ;  $\beta=0.20$ ,  $p<0.001$   $\beta=0.10$ ,  $p<0.05$ ), and between teacher support and self-planning played a fully mediating role ( $\beta=0.20$ ,  $p<0.001$   $\beta=0.10$ ,  $p>0.05$ ).

Table 3. Hierarchical Regression of the Relationship among Variables in This Study

DV→	Self-directed Learning Capability												SE
	SAC				SPC				LRSC				
$\beta(p)$	M	M	M	M	M	M	M	M	M	M	M	M	M
IV↓	1-1	1-2	1-3	1-4	2-1	2-2	2-3	2-4	3-1	3-2	3-3	3-4	M4
Gender	0.03	0.01	0.00		0.02	0.00	-0.00		0.03	0.01	0.00		0.01
Dept.	-0.10	-0.05	-0.05		-0.11	-0.05	-0.05		-0.14	-0.07	-0.07		0.01
Birth Place	-0.04	0.00	-0.00		-0.06	-0.02	-0.03		-0.04	0.00	-0.00		0.01
FS		0.22***	0.08			0.16*	0.02			0.15*	0.03		0.34**
CS		0.21***	0.13*			0.34***	0.26***			0.23***	0.16**		0.21***
TS		0.28***	0.17**			0.20***	0.10			0.34***	0.25***		0.26***
ES			0.41***	0.65***			0.41***	0.64***			0.35***	0.64***	
F	2.32	53.87***	64.38**	350.2***	2.94*	54.10**	64.39**	336.38**	3.66*	63.55**	69.85**	328.09***	79.99**
R <sup>2</sup>	0.01	0.41	0.49	0.42	0.02	0.41	0.49		0.02	0.45	0.51	0.41	0.50
$\Delta R^2$		0.40	0.08			0.39	0.08			0.43	0.08		

Note: M=Model, Dept.= Department \*  $p<0.05$  \*\*  $p<0.01$  \*\*\*  $p<0.001$

Then, this study further tested the significance of the mediating effect of self-efficacy using the Sobel test (Sobel, 1982). The results showed that self-efficacy had an indirect effect ( $z > 1.96$ ,  $p < 0.05$ ) on the relationship between social support (family, peers, and teachers) and self-directed learning capability (self-assessment capability, self-planning capability, and learning resources seeking capability), respectively. Therefore, the hypotheses of H4-1~H4-3, H5-1 ~ H5-3, and H6-1 ~ H6-3 were confirmed and supported, respectively.

## DISCUSSION

The main purpose of this study was to examine how social support affects college students' self-directed learning capability and to further examine whether self-efficacy mediates the relationship between social support and self-directed learning capability. The results of the study showed that when college students received higher levels of support from family members, peers, or teachers, they were able to improve their self-assessment, self-planning, and resource-seeking capabilities in establishing an active diagnosis or understanding of their own learning needs, setting plans and learning goals, choosing learning strategies, and seeking human resources such as teachers, peers, family and friends, or related tools, channels, and environments in the learning process. Secondly, the results of this study also found that the higher the level of support received by college students from their families, classmates or teachers, the more positive the effect on their confidence in accomplishing their academic goals. In turn, when college students have higher confidence in their academic goals, it positively helps them in diagnosing their learning needs, setting learning goals, choosing appropriate learning strategies, and building their capability to seek human and material resources.

## CONCLUSIONS AND IMPLICATIONS

The results of this study revealed that the support of family members, peers, and teachers has an important impact on how students are motivated to learn with confidence in their learning goals and, in turn, build their own self-directed learning capabilities. Therefore, it is quite important for individual students to build harmonious and intimate relationships with their families. When individuals are faced with academic stress and difficulties, they can be psychologically supported through the comfort and encouragement of their families so that they can regain their motivation to study. Second, individual students can establish favorable learning interactions with their classmates. In the process of mutual observation and motivation, they can learn from each other's strengths, build their learning confidence, and further strengthen their understanding of their own learning needs, make appropriate learning plans, and know where to obtain learning resources effectively. As for teachers, they should actively

understand the differences in individual students' traits, ability levels, and learning styles so that students can continue to gain successful experiences in the learning process, and give positive feedback and encouragement to students to enhance their self-confidence in achieving their goals. Teachers should also support and encourage students to participate in discussions and activities to enhance two-way communication and sharing opportunities between teachers, students and peers so that they can learn from each other and make progress together, and create an open and friendly learning environment and atmosphere in a subtle process so that students can gradually expand their learning horizons and construct their self-directed learning capabilities.

## LIMITATIONS AND FUTURE RESEARCH

The results of this research at least have the following limitations. First, the population of this study is limited to students of Z University, and the results of the study may be applicable only to that university. Therefore, the external validity of the study is limited. Second, during the data collection process, some students may be defensive in answering some questions, so there may be arbitrary answers in the questionnaire, which may cause biases in the analysis of this study.

Finally, future studies can add other situational variables, such as the learning atmosphere of the class and collective psychological capital to make inferences and analyses of the relationships between variables at different levels more precise through a cross-level research design. And then a comparative analysis can be conducted with students from other universities with the same major to establish the validity of the study and to better understand the problems and differences.

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