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MEDIATING EFFECTS OF CREATIVE HOME ENVIRONMENT AND SELF-DIRECTED LEARNING ABILITY ON THE RELATIONSHIP BETWEEN CREATIVE PERSONALITY AND CREATIVE ACHIEVEMENT INTENTION

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Abstract. This study verified the mediating effects of creative home environment and self-directed learning ability on the relationship between creative personality and creative achievement intention of university students. Creative personality was set as independent variable, creative home environment and self-directed learning ability as mediating variables, and creative achievement intention as dependent variable. This study was conducted from June 10 to July 10, 2019 in Seoul, South Korea, and the participants were 587 university students. Data was collected through an online–offline test and analysed using *SPSS Statistics 25.0*. Creative personality affected creative achievement intention through the medium of creative home environment. However, self-directed learning ability had no mediating effect in the influence of creative personality on creative achievement intention. Therefore, creative home environment is important to improve the creative achievement intention of university students. Further, that the family's environmental support affects the creative achievement intention to express creativity in course of development bears implications for parent education.

Keywords: creative achievement intention, creative home environment, creative personality, mediating effect, self-directed learning ability, parallel multiple mediator model.

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1. Introduction

Our living environment has greatly evolved over time. The self-moving car, which was once only an imagination, became a reality in the form of the autonomous vehicle we see today. Further, artificial intelligence has become deeply embedded into our daily lives and activities, such as singing, cleaning, and even operating on behalf of humans. Science and technology changed our lives to a large extent. However, its mere development cannot completely change our lives. If humans did not imagine, constantly think, and make efforts to change the reality and usher in social transformation, these innovations and changes would not have been possible. It is creativity that fuels such constant efforts and imagination.

Future society will have more rapid and diverse changes than ever. For this, the creative ability to produce other ideas and attitude to adapt and cope with new changes will require more creative personality and attitude. One adapts to a changed environment through creative attitude. As new technologies are expected to be developed further in the future, new types of jobs, environments, and schools will be created following the development of science and technology. Learning new skills and applying them to the daily life in a rapidly changing society needs creative thinking, creative attitude, and creative problem solving.

Previously, the social talent required by the industry implied a talented person with high academic background and high level of ability. However, as a condition for adapting to the changing social form, companies seek individuals with creativity, creative management, and creative problem-solving ability (Lee, 2013). Although organization members' ability to use the speed and information at work has been highly appreciated in the past, it is now necessary to recognize and apply evolving technology according to the Fourth Industrial Revolution and have the flexibility to actively reconstruct and utilize work (Sohn, 2018). Talents who can accept new changes and reconstruct and utilize them with their own knowledge need creativity convergence capabilities. Creative convergence competence is an integration of creative thinking and creative personality that can create their own new knowledge by combining knowledge in various areas with insight in a rapidly changing society (Lee, 2020b). To cultivate creative convergence talent, it is necessary to educate about creative problem solving and creative output based on creativity. Therefore, the Ministry of Education (South Korea, SK) (2015) also presented core competencies, such as self-management capability, child information processing capability, creative convergence thinking capability, psychological emotional capability, communication capability, and community capability to cultivate creative convergence type human resources.

Creativity should be the basis for creative convergence capability, and creativity has been actively studied since Joy Paul Guildford was presented in the 1950s. Creativity can be applied to cognitive, affective, and environmental domains. Cognitive domains include fluency, flexibility, originality, and sophistication. Affective domains include curiosity, humor, challenging spirit, and willingness to finish with creative personality. Environmental domains are home, school, and sociocultural environment. Recently, creativity was recognized as being expressed through the interaction of cognition, justice, and environment (Lee et al., 2019). The family is the social environment that individuals are born into and adapt to for the first time. Hwang (2014) said that the home environment, among all environments, had the greatest influence on individuals' creativity, and Lubart (2010) also claimed that creativity has a great influence on the environment because it is deeply related to social situations and contexts. Pugsley and Acar (2020) said that parents value creativity at home, and positive attitude toward creativity is related to supporting children's creativity. The creativity formed during childhood affects the creative thinking ability of adulthood (Kim & Yang, 2008). Hence, the composition of creative home environment provided by parents is important. Owing to the COVID-19 pandemic, students had to adapt to online learning, which entails learning in an environment different from offline learning in schools. It is mainly used for online classes using smart devices, such as computers, smartphones, and tablets. The online teaching method using digital devices, which was expected to be a part of future education, has now become our reality. Online learning does enable learners to learn without time and space constraints. However, this also implies learners' need and ability to control themselves. The self-directed learning ability that controls oneself and conducts learning with plan is necessary and emphasized upon. Self-directed learning ability has become a necessary competency in online learning (Yoo, 2020).

According to Knowles (1975), self-directed learning means that learners diagnose their own needs for learning, set goals for learning, secure resources necessary for the learning process, select and implement learning strategies suitable for their learning style, and learn

the results in a leading position. Tough (1978) mentioned that this self-directed learner has his own learning goal, designed the learning process, and made detailed decision-making on the learning strategy. Long (1992) observed that self-directed learning depends on how much the learner intervenes in the learning activity. The components of self-directed learning ability include self-concept, open attitude, intrinsic motivation, creativity, self-evaluation, autonomy, and problem-solving ability (Guglielmino, 1978). Additionally, Lee et al. (2017) divided the domain of self-directed learning into cognitive, affective, and behavioral domains. Cognitive domain includes cognitive thinking, metacognition, and problem-solving ability. Affective domain includes intrinsic motivation, future-oriented motivation, self-efficacy. Behavioral domain includes help, physical environment management, and time management. The control of Jung (2008) included cognitive strategy, demonstration, memory, check, and plan; motivational control included self-efficacy, intrinsic value, test anxiety, and external goal orientation. Behavioral control included effort control, time and study control, help seeking strategy, and study environment control. Hong's (2014) idea of cognitive domain included cognitive strategy and metacognitive strategy in self-directed learning ability, motivational domain included destination orientation, openness, self-efficacy, achievement value, test anxiety; and behavioral domain included academic time management, help seeking, and behavioral control.

In the relationship between self-directed learning and innovative behavior, Ko and Seo (2018) suggested that creative thinking skills in terms of individual creativity showed moderating effects in the role of creating and promoting ideas. This means that when learners set their own learning goals and actively perform them, they can promote the creation of ideas needed for the organization. Therefore, when creative ability and self-directed learning are combined, the innovative behavior of the organization is amplified. Kim and Kim (2012) identified a positive correlation between creativity score and self-directed learning ability composed of creative motivation including curiosity, creative attitude including identity, and creative ability including knowledge pursuit. Kim (2017) proposed that it has a partial mediating effect on academic self-efficacy in the relationship between creativity and self-directed learning ability. This means that creativity has a direct effect on self-directed learning ability and indirectly affects self-directed learning ability through learner's academic self-efficacy in learning. Song (2012) also said that original flexibility, adventure free pursuit, and relational openness, among the factors that constitute creativity, have an effect on self-directed learning. Torrance and Mourad (1978) found positive correlations among creative thinking, creative personality, creative performance, and self-directed learning readiness.

Ka Hyung Lee and K.-H. Lee (2020) mentioned the difference between creative achievement intention and creative personality. The creative personality is originally the personality of the person. However, in the creative achievement intention, the inner intention deliberately expresses the will to think and act creatively. And it is about whether they experienced creative experience or achievement with the will generated from internal intention by external execution. Such creative achievement intention is a part of creativity, which is close to creative output among creative ability, creative personality, creative home environment, and creative output (Lee, 2020a). Therefore, the study of creative achievement intention of K. H. Lee and K.-H. Lee (2020) can be measured including internal and external intentions and executions related to creative achievement.

Previous studies have shown that there is a relationship between creativity and creative home environment, self-directed learning ability and creativity, creativity and creative achievement intention. Therefore, this study aims to investigate the correlation between the relationships revealed in previous studies at once. Also, this study investigated whether creative home environment and self-directed learning ability have a mediating effect on the influence of creative personality of university students on their creative achievement intention. The research questions of this study are as follows:

Research question 1: What are the correlations among creative personality, creative home environment, self-directed learning ability, and creative achievement intention?

Research question 2: Is there a mediating effect of creative home environment and self-directed learning ability on the relationship between creative personality and creative achievement intention?

2. Methods

2.1. Research model

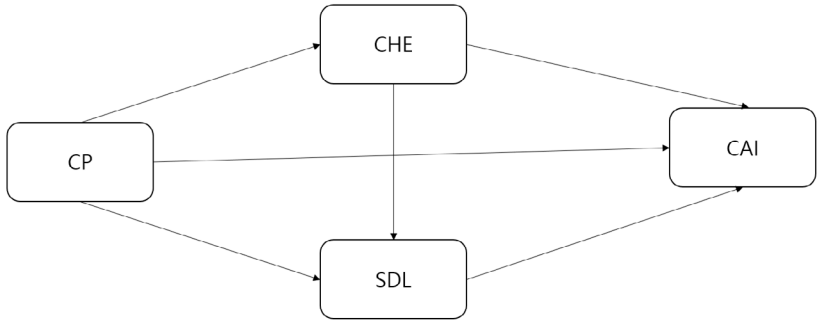
This study developed the following research model to verify the mediating effect of creative home environment and self-directed learning ability on the relationship between creative personality and creative achievement intention of university students. The research hypothesis and research model of this study are as follows (Figure 1):

Research hypothesis 1: Creative personality will affect creative achievement intention;

Research hypothesis 2: Creative personality will affect creative achievement intention by mediating the creative home environment;

Research hypothesis 3: Creative personality will affect creative achievement intention by mediating self-directed learning ability;

Research hypothesis 4: Creative personality will affect self-directed learning ability by mediating creative home environment.



Note: CP – creative personality, CHE – creative home environment, SDL – self-directed learning, CAI – creative achievement intention.

Figure 1. Research model (source: created by author)

2.2. Participants

In this study, 587 students from 1st to 4th grade were randomly selected from university students enrolled at S, D, Y, and K universities in Seoul and the metropolitan area of SK. A survey was conducted from June, 2020 to July, 2020. Data of 587 students were analyzed, excluding 13 insincere data from the 600 students we collected data from. Table 1 shows the distribution of study participants.

Table 1. Participants (source: created by author)

		Number	%
Major	Humanities and social sciences	320	54.5
	Natural sciences	267	45.5
Gender	Male	314	53.5
	Female	273	46.5
Grade	1st	97	16.5
	2nd	134	22.8
	3rd	184	31.3
	4th	172	29.3
Total		587	100.0

There were 320 (4.5%) students from the humanities and social sciences and 267 (45.5%) from the natural sciences. There were 314 males (53.5%) and 273 females (46.5%). There were 97 first graders (16.5%), 134 second graders (22.8%), 184 third graders (31.3%), and 172 fourth graders (29.3%).

2.3. Measurement tool

This study measured the mediating effect of creative home environment and self-directed learning ability on the relationship between creative personality and creative achievement intention of university students. The following measurement tools were used.

2.3.1. Creative personality test

In this study, the Korean integrated creativity test, developed and standardized by Lee (2014), was used to measure the creative personality of university students. The creative personality test consists of 6 sub-factors consisting of 30 questions, each of which consists of curiosity, task commitment, sensitive thinking, independence, humor, independence/adventure, and problem-solving leadership. Curiosity explores the surroundings, asks questions, and expresses his curiosity. Sensitive thinking is about observing the surrounding environment, looking at it sensitively, and being interested in the small things around it. Task-commitment is the willingness to continue to solve any problem. Humor is a sense of humor that can create new ideas or help to make things fun. Independence/adventure is a spirit of challenging what you want to do without fear of failure. Problem-solving leadership tends to approach and solve various problems.

The Cronbach's alpha was .780–.800, making it a reliable testing tool. The question composition of the test is as follows (Table 2).

Table 2. Question composition of creative personality test (source: created by author)

Domain	Variable content	Item number	Item	Cronbach's alpha
Curiosity	Observe and question things around you and ask questions	1, 11, 18, 24, 25	5	.800
Sensitive thinking	Observe the surrounding environment, take a sensitive look, and become interested	6, 8, 16, 23, 26	5	.810
Task-commitment	Resisting, continually addressing problems on certain topics	7, 9, 15, 222, 27	5	.780
Humor	Humorousness that helps make things fun or create new ideas	3, 5, 12, 21, 28	5	.790
Independence/adventure	The spirit of trying to challenge without fear of failure	4, 13, 17, 20, 29	5	.790
Problem-solving leadership	Tendency to approach and solve various problems	2, 10, 14, 19, 30	5	.770

2.3.2. Creative achievement intention test

In this study, the test developed and validated by K. H. Lee and K.-H. Lee (2020) was used to measure the creative achievement intention test of university students. The sub-factors include 6 items of internal motivation and external execution, and hence, 12 items in total. Inner motivation means trying to create new ideas, trying to challenge new things, and thinking creatively. External experience is an experience to actively participate in the competition, the club, *etc.*, which produces creative output, the experience of achieving creativity, the start-up. The test uses a 5-point Likert scale, and its Cronbach's alpha was .793–.800, making it a reliable testing tool. The question composition of the test is as follows (Table 3).

Table 3. Question composition of creative achievement intention test (source: created by author)

Domain	Variable content	Item number	Item	Cronbach's alpha
Inner motivation	Motivation to think new ideas, challenges, and ideas	1–6	6	.793
External experience	Active participation in activities, competitions, start-ups, and clubs where creativity should be actively demonstrated	7–12	6	.800

2.3.3. Creative home environment test

In this study, the creative home environment test developed by K. H. Lee and K.-H. Lee (2019) was used to measure the creative home environment of university students. The sub-factors are divided into psychological support environment and physical support environment, and it has a total of 20 items. Psychological support environment is an attitude that parents respect and allow their children's creativity at home, an attitude that interacts and shares creative

opinions, and actively forms and maintains a creative atmosphere. Physical support environment is to give parents a chance to provide their children with a personal space, give them free time, provide tools for creative activities, and have creative experiences. The test uses a 5-point Likert scale, and the Cronbach's alpha was .866–.865, making it a reliable testing tool. The question composition of the test is as follows (Table 4).

Table 4. Question composition of creative home environment test (source: created by author)

Domain	Variable content	Item number	Item	Cronbach's alpha
Psychological support environment	Respect for opinions, permissive attitude, creative interaction, creativity-centered attitude	1–10	10	.866
Physical support environment	Provide personal space, time, and creative activity tools	11–20	10	.865

2.3.4. Self-directed learning ability test

In this study, the self-directed learning ability test developed Lee et al. (2017) was used. The sub-factors include cognitive, affective, and behavioral domains. Cognitive refers to cognitive ability, metacognitive ability, and problem-solving ability. Affective means intrinsic motivation, future-oriented motivation, and self-efficacy. Behavioral means the ability to manage help, manage the physical environment, and manage time. The 64 questions are answered using a 5-point Likert scale. It is a self-reporting test. The Cronbach's alpha was .923, making it reliable as a testing tool. The question composition of the test is as follows (Table 5).

Table 5. Question composition of self-directed learning ability test (source: created by author)

Domain	Variable content	Item number	Item	Cronbach alpha
Cognitive	Cognition, metacognition, problem-solving ability	1–23	23	.775
Affective	Intrinsic motivation, future-oriented motivation, self-efficacy	24–45	22	.789
Behavioral	Help, physical environment management, time management	46–64	19	.786

3. Research procedure and data analysis

A total of 600 college students attending S, D, Y, and K universities in Seoul were surveyed. Among the collected data collected, insincere data from 13 students were excluded, and a total of 587 students' data were analyzed.

The collected data were analyzed using *SPSS Statistics 25.0* program. Descriptive statistics were calculated to confirm the distribution and composition of the collected data; Pearson correlation coefficient (PCC) was calculated for correlation between variables. To verify the mediating effect of creative home environment and self-directed learning between creative personality and creative achievement intention, this study analyzed the proposed process

macro model 4 by Hayes (2013). Additionally, statistical significance was confirmed through bootstrapping to analyze the mediating effects of creative home environment and self-directed learning ability.

4. Results

4.1. Results of the statistical analysis

The average and standard deviation of the collected data were calculated by item, and the degree of distortion and kurtosis were confirmed to verify the rectification distribution. In the descriptive statistics of the main variables, the total variables' skewness was the absolute value of 3, and kurtosis is considered normal distribution if it does not exceed the absolute value of 8–10 (Kline, 2005). The questions of this study were the appropriate level, and the degree of skewness was the absolute value of .023–.522, which is the standard value. This confirms its normal distribution. The kurtosis was shown between the absolute value .057–.767, which corresponded to the absolute value below the standard. The Table 6 is showing the average, standard deviation, skewness, and kurtosis of variables and components in this study is as follows.

Table 6. Descriptive statistics of measurement variables (source: created by author)

Factor	Sub-factor	Mean	Standard deviation	Skewness	Kurtosis
Self-directed learning	Cognitive	3.744	.543	.127	.283
	Affective	3.719	.564	.160	.119
	Behavioral	3.587	.596	.212	–.060
Creative personality	Curiosity	3.474	.719	–.023	–.042
	Sensitive personality	3.522	.612	.166	.055
	Task commitment	3.371	.649	.281	–.057
	Humor	3.465	.619	.289	.235
	Independence/adventure	3.398	.613	.302	.216
	Problem-solving leadership	3.602	.618	.029	–.069
Creative home environment	Psychological support	3.576	.611	–.522	.767
	Physical support	3.300	.683	–.317	.164
Creative achievement intention	Inner motivation	3.770	.671	.048	–.656
	External experience	3.397	.760	–.175	.454

4.2. Creative personality, creative achievement intention, creative home environment, and self-directed learning ability

In this study, PCC was calculated to analyze the correlation among creative home environment and self-directed learning ability as independent variables, creative personality as dependent variable, and creative achievement intention as mediating variable. The correlation is as follows (Table 7).

Table 7. The relationship among creative personality, creative achievement intention, creative home environment, and self-directed learning ability (source: created by author)

	Creative personality	Creative achievement intention	Self-directed learning	Creative achievement intention
Creative personality	1			
Creative achievement intention	.377*	1		
Self-directed learning	.005	–.042	1	
Creative achievement intention	.507*	.552*	.018	1

Note: *p < .01.

Creative personality and creative home environment had a significant correlation with r = .377 (p < .01), and creative personality and the creative achievement intention had a significant correlation with r = .507 (p < .01). However, it was found that creative personality and self-directed learning ability did not have a significant correlation with r = .005 (p > .05). Creative home environment and creative achievement intention had a significant correlation with r = .552 (p < .01), but creative home environment and self-directed learning ability did not have a significant correlation with r = –.042 (p > .05). There was no significant correlation between self-directed learning ability and creative achievement intention r = .018 (p > .05).

4.3. The relationship between creative personality, creative achievement intention, creative home environment, and self-directed learning ability

This study investigated the mediating effects of creative home environment and self-directed learning ability on the influence of creative personality on creative achievement intention. The results are as follows (Table 8).

When the mediator path of creative personality on creative achievement intention was analyzed, the total effect (β = .456, p < .001), which added indirect effect through the effect, and the mediator that creative personality directly affects creative achievement intention was significant. While creative personality had a significant effect on creative home environment (β = .454, p < .001), self-directed learning ability (β = .004, p > .05) did not have a significant effect. It was found that creative personality did not have a significant effect on the effect of self-directed learning ability through the medium of creative home environment. Creative personality, creative home environment, and creative achievement intention, which are creative products, were found to have correlation and influence relationship. However, creative personality did not have a significant effect on self-directed learning ability, and creative home environment did not have a significant effect on self-directed learning ability. In addition, self-directed learning ability did not have a significant effect on creative achievement intention, which is a creative product.

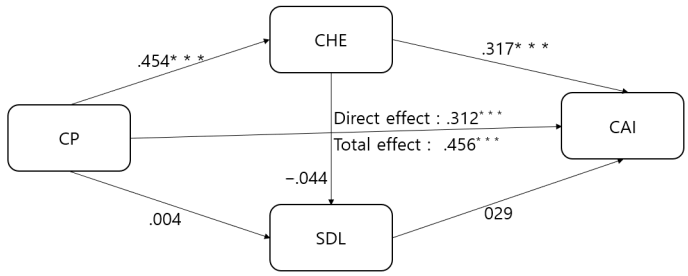
In order for creative home environment and self-directed learning ability to be established as a parameter in the relationship between creative personality and creative achievement intention, Hayes (2009) said that the influence on independent and dependent variables and parameters should be statistically significant. When the parameter is added, the influence on

Table 8. The mediating effects of creative home environment and self-directed learning ability in the relationship between creative personality and creative achievement intention (source: created by author)

Model	Variables			β	Standard error	Student's *t*-test	95%, confidence interval	
	Prediction		Reference				Lower limit	Upper limit
Creative personality (CP) → creative home environment (CHE)	CP	→	CHE	.454	.046	9.836*	.364	.545
F = 96.753*, R^2 = .142								
CP → self-directed learning (SDL)	CP	→	SDL	.004	.043	.096	–.081	.089
F = .009, R^2 = .000								
CP → SDL	CP	→	SDL	.024	.047	–1.142	–.067	.116
	CHE			–.044	.039	–1.142	–.121	.032
F = .656, R^2 = .002								
CP → creative achievement intention (CAI)	CP	→	CAI	.312	.030	10.080*	.251	.372
	CHE			.317	.025	12.361*	.267	.368
	SDL			.029	.027	1.087	–.023	.083
F = 135.646*, R^2 = .411								

Note: *p < .001.

independent and dependent variables should be reduced. The results of this study show that when creative home environment and self-directed learning ability are added as parameters rather than the influence of creative personality on creative achievement intention (β = .456, p < .001), the influence of creative personality on creative achievement intention (β = .312, p < .001) is reduced. Thus, creative home environment mediates the relationship between creative personality and creative achievement intention. The results of the research model implemented in this study are as follows (Figure 2).



Note: CP – creative personality, CHE – creative home environment, SDL – self-directed learning, CAI – creative achievement intention.

Figure 2. Mediating effects of creative home environment and self-directed learning ability in the relationship between creative personality and creative achievement intention (source: created by author)

In the relationship between creative personality and creative achievement intention, bootstrapping was conducted to confirm the mediating effect and significance of creative home environment and self-directed learning ability, the sample number was designated as 500, the confidence interval was 95%, and the lower limit (LL) and upper limit (UL) were analyzed (Table 9).

Table 9. Indirect effects of creative home environment and self-directed learning ability in the relationship between creative personality and creative achievement intention (source: created by author)

Path	Effect	Standard error	95%, confidence interval	
			Lower limit	Upper limit
Creative personality (CP) → creative home environment (CHE) → creative achievement intention (CAI)	.144	.023	.100	.194
CP → self-directed learning → CAI	.000	.001	–.003	.004
Total indirect effect	.144	.023	.100	.193

The size of the total mediating effect (Effect = .144, LL = .116, UL = .193) was significant because it did not include 0 in the 95% confidence interval. In the relationship between creative personality and creative achievement intention, creative home environment (Effect = .144, LL = .100, UL = .194) had a significant mediating effect because it included 0 in the 95% confidence interval. However, in the relationship between creative personality and creative achievement intention, self-directed learning ability (Effect = .000, LL = –.003, UL = .004) did not have a significant mediating effect because it included 0 the 95% confidence interval. In the effect of creative personality on creative achievement intention, which is a creative product, indirect effect of creative home environment was significant. However, the indirect effect of self-directed learning ability was not significant in the effect of creative personality on creative achievement intention, which is a creative product.

These statements are as a result of the research hypothesis:

1. Creative personality was analyzed to have a positive effect on creative achievement intention;
2. The creative home environment had a mediating effect on the relationship between creative personality and creative achievement intention;
3. Self-directed learning ability had no mediating effect on the relationship between creative personality and creative achievement intention;
4. Creative home environment had no mediating effect on the relationship between creative personality and self-directed learning ability.

5. Conclusions

This study investigated whether creative home environment and self-directed learning ability have a mediating effect on the influence of creative personality of university students on their creative achievement intention. The results are as follows.

First, creative personality, creative home environment, and creative achievement intention were significantly correlated. In the study of Kang (2009), the challenging spirit, curiosity, and active inquiry of university students affected creative achievement. In the results of the study by K. H. Lee and K.-H. Lee (2020), creative home environment affected creative convergence competence and creative achievement, and the relationship between creative home environment and creative personality had a significant correlation (Lee et al., 2019), and the context is the same. This means that there is a significant positive correlation among creative home environment, creative personality, and creative achievement intention as variables based on creativity. However, the results of the study (Baek et al., 2018), self-directed learning can be an important factor in cultivating creativity, but there was no significant correlation with creative achievement intention.

Second, creative home environment had a significant mediating effect on the relationship between creative personality and creative achievement intention. This is the same as the result of analyzing the significant mediating effect of creative home environment in the relationship between creative characteristics, creative achievement, and creativity convergence competence in the two-way type, and it is also the same as that which showed that creative home environment plays an important role in challenging new things (Lee et al., 2019). In this study, the mediating effect of self-directed learning ability was examined in the influence of creative personality on creative achievement intention, and the results of this study showed that it did not have a mediating effect. This is different from the result of the study which showed that self-directed learning ability can have a significant effect on creativity (Kim, 2021). Self-directed learning ability has a direct and indirect influence on creativity as the ability to actively control and act on a given task (Kim, 2021). In contrast to the previous studies that creative home environment has a significant effect on self-directed learning ability, this study did not have a significant effect. Creative achievement intention implies to think, act, and execute creatively. However, it is more influenced by creative personality than self-directed learning ability.

6. Discussion

As a result of this study, it was found that the creative personality of college students had a significant effect on creative achievement intention, and the mediating effect related to the creative home environment was significant.

As the creative personality that we know becomes the driving force for the creative output and the creative home environment as an environmental factor can be mediated and promoted, it is important not only to the individual tendency but also to the environment that parents can provide to their children. Therefore, at home, parents need to create a home environment creatively, and provide creative experiences, time, and space as well as interaction with parents and children. As mentioned in previous studies, such a creative home environment is important because it can become a driving force for creative achievement when children become adults. And by recognizing the importance of a creative home environment in parent education, it is necessary to recognize the fact that the creative personality formed in childhood has the same effect in adulthood and to awaken the intention to achieve it.

References

Baek, M. J., Kwon, K. A., Park, M. S., & Ryu, H. Y. (2018). Cheongsonyeon-ui gieopgajeongsini jagiju-dohakseubgwa changyiseong-e michineun yeonghyang-e gwanhan yeongu [The effects of youth entrepreneurship on self-directed learning and creativity]. *Korean Business Education Review*, *33*(6), 63–80. https://doi.org/10.23839/kabe.2018.33.6.63

Guglielmino, L. M. (1978). *Development of the self-directed learning readiness scale* [PhD/Doctoral Thesis, University of Georgia]. Athens, Georgia [unpublished source].

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, *76*(4), 408–420. https://doi.org/10.1080/03637750903310360

Hayes, A. F. (2013). *Introduction to mediating, moderation, and conditional process analysis: A regression-based approach*. The Guilford Press.

Hong, K.-Ch. (2014). Chodeunghaksaeng-yong jagijudohakseubryeok geomsa-ui tadanghwa [A study on the validity of the self-directed learning ability test for elementary school students]. *Korean Journal of Thinking Development*, *10*(2), 1–30.

Hwang, W. S. (2014). *Godeunghaksaeng-ui Chang-uijeok Gajeonghwangyeong-gwa Bumo-Janyo Gan Uisasotong-i Chang-uijeok Seonghyang-e Michineun Yeonghyang: Seongchimokpyodonggi, Jagigyol-jeongseongdonggi, Jagihyeog-eunggam-ui Maegaehyogwa-reul Jungsim-euro* [The effects of creative home environment and parent-adolescent communication on creative personality-centering on the mediating effects of achievement goal motivation, self-determination motivation, and self-efficacy] [PhD/Doctoral Thesis, Seoul Cyber University]. Seoul, South Korea [unpublished source].

Jung, M.-K. (2008). *Jagijojulhakseup tamgu: Jagijojulhakseup-ui gaenyeonhwareul tonghayeo* [Self-regulated learning: The relationship between academic achievement and academic achievement]. Korean Academic Information.

Kang, S. H. (2009). Gonggwadaehakseng-ui chang-uijeok seongchi-e Yeong-hyang-eul ju-neun yoin tamsaek: Gyeongjindae hoe susangtim-eul jungsim-euro [Factors related to creative achievement in engineering students]. *Journal of Engineering Education Research*, *12*(3), 59–72. https://doi.org/10.18108/jeer.2009.12.4.3

Kim, A.-K. (2017). Jeonmundae haksaengdeul-ui chang-uiseong-gwa jagiju-do hakseub neungryeok-ui gwangyeeseo hak-eobjeok jagihyoeunggam-ui maegahyogwa [The mediating effects of academic self-efficacy on the relationship between creativity and self-directed learning ability in college students]. *Youth Facilities and Environment*, *15*(2), 149–160.

Kim, E. (2021). Pyeongsaenggyoyukgigwan seonginhakseupja-ui jagijudo hakseubneungryeogi injidwen hak-eobseongchwido-e michineun yeonghyang: chang-uiseong-e daehan maegahyogwa [The influence of the self-directed learning ability of adult learners in life-long learning centers upon perceived learning achievement: The mediating effect upon creativity]. *Journal of Learner-Centered Curriculum and Instruction*, *21*(9), 149–167. https://doi.org/10.22251/jlcci.2021.21.9.149

Kim, H., & Kim, J. Ch. (2012). Banggwahu hakgyo chamyeoga adong-ui hak-eob seongchi-e michineun yeonghyang: jagijudojeok hakseubneungryeokgwa chang-uiseong-ui maegahyogwa [A study on the effects of after-school program participation on children's academic achievement: Focused on the mediating effects on self-directed learning skills and creativity]. *Soonchunhyang Journal of Humanities*, *31*(2), 172–199.

Kim, Y. E., & Yang, M. S. (2008). Adonggi gajeonghwangyeonggwa donggi yuhyeongi seongingi jeongseo-jineunggwa changuijeok sagoneungryeoge michineun yeonghyang: Adonggi hoesangeul jungshimeuro [The effect of home environment and childhood motivational style on emotional intelligence and creative thinking in adulthood: Based on the recalled childhood]. *Korean Journal of Child Studies*, *29*(1), 373–386.

Kline, Th. J. B. (2005). *Psychological testing: A practical approach to design and evaluation*. SAGE Publications, Inc. https://doi.org/10.4135/9781483385693

Knowles, M. (1975). *Self-directed learning: A guide for learners and teachers*. Association Press/Follett Publishing Company.

Ko, S.-S., & Seo, N.-S. (2018). Jorisayi jagijudohakseubi hyeoksinhaengdonge michineun yeonghyange isseo ga-in chang-uiseongui jojeolhyogwa [The moderating effects of individual creativity in the effect of cooks' self-directed learning ability on innovative behavior]. *Tourism Research*, *43*(2), 1–22.

Lee, A. R., Kim, S. Y., & Jung, J. H. (2019). Adongi jigakhan chang-uijeok gajeonghwangyeongi chang-ui-jeok inseonge michineun yeonghyang: ttoraeapryeogui jojeolhyogwareul jungsimuro [The effect of creative home environment on the creative personality: Moderating effect of peer pressure]. *Korean Journal of Thinking Development*, *15*(1), 61–82. https://doi.org/10.51636/JOTD.2019.04.15.1.61

Lee, K. H. (2020a). *Chang-uiyung-hab-yeokryang-gwa gyosuja jeonmunseong* [Creative conflience competency and proficiency: Creative confluence education]. Junhminsa.

Lee, K. H. (2020b). *Daehaksaeng-ui chang-uijeok teukseong*, *chang-uijeok seongchi mit chang-uiyung-hab-yeokryang gan-ui gwangyeeseo chang-uijeok gajeonghwangyeong-ui maegae hyogwa* [The mediating effect of creative home environment on the relationship between creative traits, creative achievement, and creative convergence competency of university students] [PhD/Doctoral Thesis, Soongsil University]. Seoul, South Korea [unpublished source].

Lee, K. H. (2013). (*Miraechangjoreul wihan*) *Chang-uiseong: Byeonhwawa hyeoksin-ui kiweodeu*, *chang-uiseong-eul kkaewora* [Creativity (for future creation): Wake up the keywords, creativity, and innovations]. Kaos Book.

Lee, K. H. (2014). *Tonghap Changui Sung Geomsa* (*K-ICT*) [Integrative creative test (K-ICT)]. Insight.

Lee, K. H., & Lee, K.-H. (2020). Changuijeok Seongchwi Uido Geomsa Gaebal Mich Taedanghwa [Development and validation of creative achievement intention test]. *Global Creative Leader: Education and Learning*, *10*(2), 47–66.

Lee, K. H., & Lee, K.-H. (2019). Changuijeok Gajeonghwangyeong Chekmung Dogu Gaebal Mich Taedanghwa [Development and validation of creative home environment measuring tool]. *Journal of Creativity Education*, *19*(2), 129–152. https://doi.org/10.36358/JCE.2019.19.2.129

Lee, K.-H., Park, H.-S., & Kim, S. Y. (2017, 20–23 July). *Self-directed validation study* [Conference presentation]. 22nd World Council for Gifted and Talented Children Biennial World Conference, Sydney, Australia [unpublished source].

Long, H. B. (1992). Philosophical, psychological and practical justifications for studying self-direction in learning. In H. B. Long (Ed.), *Self-directed learning: Application and research* (pp. 9–24). University of Oklahoma.

Lubart, T. (2010). Cross-cultural perspectives on creativity. In J. C. Kaufman & R. J. Sternberg (Eds.), *The Cambridge handbook of creativity* (pp. 265–278). Cambridge University Press. https://doi.org/10.1017/CBO9780511763205.017

Ministry of Education. (2015). *The National curriculum for the primary and secondary schools*. http://www.koreaneducentreinuk.org/wp-content/uploads/2021/02/The-National-Curriculum-for-the-Primary-and-Secondary-Schools-2015.pdf

Pugsley, L., & Acar, S. (2020). Supporting creativity or conformity? Influence of home environment and parental factors on the value of children's creativity characteristics. *Journal of Creative Behavior*, *54*(3), 598–609. https://doi.org/10.1002/jocb.393

Sohn, S. (2018). Dogil-ui Sacha San-eophyeokmyeong-gwa Gieob-ui Jeonsajeok Tonghabdaeeung [The 4th Industrial Revolution in Germany and the enterprise-wide response]. *Koreanstudies Information Service Systems*, *36*(3), 1–22. https://doi.org/10.18237/KDGW.2018.36.3.001

Song, J.-M. (2012). *Chang-uiseong-gwa Chaeg-imjihyangseong-i Seong-in-ui Jagi-judo-hakseub-e Michineun Yeonghyang* [A study of the effects of creativity and personal responsibility orientation on self-directed learning of adults] [PhD/Doctoral Thesis, Chungnam National University]. Daejeon, South Korea [unpublished source].

Torrance, E. P., & Mourad, S. (1978). Some creativity and style of learning and thinking Correlates of Guglielmino's self-directed learning readiness scale. *Psychological Reports*, *43*(3), 1167–1171. https://doi.org/10.2466/pr0.1978.43.3f.1167

Tough, A. (1978). Major learning efforts: Recent research and future directions. *Adult Education Quarterly*, *28*(4), 250–263. https://doi.org/10.1177/074171367802800403

Yoo, J. (2020). Onlain Hakseub-eseo Jagi-judo-hakseub-neungryeok, Sanghojak-yong Mit Suseup-mankokdo-ui Gujojeok Gwangye [Structural relationship among self-directed learning ability, learner–instructor interaction, learner–learner interaction, and class satisfaction in online learning environments]. *Journal of Christian Education in Korea*, *63*, 255–281.