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Research Article

Can constructs related to creative thinking predict financial literacy?

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Abstract

This study aims to determine whether concepts related to creative thinking can predict students' financial literacy and, if so, which variables are effective and how. At the same time, an attempt was made to determine how these models work according to gender. The study is a relational survey model conducted using data from students who participated in the creative thinking and financial literacy survey in the PISA 2022 study. The students are from Austria, Belgium, Brazil, Bulgaria, Canada, Costa Rica, the Czech Republic, Denmark, Hungary, Italy, the Netherlands, Poland, Portugal, Saudi Arabia, and the United Arab Emirates. While general regression analyses were conducted with 54513 students, gender-based analyses were conducted with 24493 students for girls and 24005 for boys. Creative thinking dimensions "Participation in creative activities at school (CREATAS)", "Creative thinking self-efficacy (CREATEFF)", "Creative peers and family environment (CREATFAM)", "Participation in creative activities outside of school (CREATOOS)", "Creativity and openness to intellect (CREATOP)", "Creative school and class environment (CREATSCH)", "Imagination and adventurousness (IMAGINE)", and "Openness to art and reflection (OPENART)" were accepted as independent variables. The financial literacy score was used as the dependent variable, calculated using plausible values through the program. This study makes a unique contribution to the literature by examining the effect of creative thinking-related factors on determining financial literacy through multiple regression analysis. Remarkably, while the dimensions of creative thinking, especially those related to intellectual openness, imagination and social support, significantly predict financial literacy, on the other hand, it also shows that excessive participation in out-of-school investment activities may have a negative effect. Another prominent aspect of the study is that the above-mentioned findings are based on data from many countries. This has also revealed the effects of cultural context and educational environments by comparing countries. Although data from more than one country is available, the variance explained by the models, in general and particular, is low. This shows that financial literacy is multidimensional and cannot be explained only by creative thinking. Nevertheless, this study aims to fill the gap in the field by presenting multinational findings on the impact of creative thinking on financial literacy. In this context, although the effect size and direction differ, it can be stated with certainty that specific dimensions of creative thinking (e.g., imagination, intellectual openness, and social support) have a significant impact on financial literacy for both girls and boys. These results suggest that creativity is associated with processes such as life skills and decision-making and may have a positive impact on financial literacy.

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Introduction

Regardless of which of the concepts of "changing world" or "changes in the world" are taken as a basis, both concepts are shaped within the understanding of "creativity" and "economy." For example, the invention of the steam engine, which also triggered the emergence of the science of sociology, is an important example of creativity. The emergence of industrial workshops and factories with the steam engine initiated migration from villages to cities. The change in the understanding of the economy accompanied the social change brought about by migration. There are many similar

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events in world history. It is known that “creativity” is behind many changes, especially those based on science and technology. “Creative activities” also result in economic changes. Economic changes also bring with them several financial problems. Financial problems are among the problems that individuals have encountered in the past and continue to encounter today (Yıldırım, 2025). In short, creativity affects science and technology; accordingly, economies are reshaped. Financial behaviors also change with all these processes. The economic institution supports the educational institution within a sociological “mutual interaction” understanding. It thus contributes to advancing science and technology by providing the environment for creative ideas to emerge. Two concepts come to the forefront in this entire cycle. The first is “creative thinking,” which enables the advancement of science, technology, and even art. The second is “financial literacy”, which enables individuals to make conscious decisions in economic changes and, in time, affects the economy, a social institution, as a mass action. The financial literacy of individuals affects the economy and education, and education affects the economy. Therefore, financial literacy is due to mutual interaction. This study discussed the effects of creative thinking-related structures on financial literacy.

According to today's prevailing educational philosophy, education should be life itself (Sönmez, 2005). In the skill-focused education approach, school and life are easily integrated. Thus, students' chances of being successful in real life increase. In order to achieve this change, individuals need to have several skills. In this rapidly changing world, the importance of using knowledge and skills is becoming increasingly evident (Aycan & Özbek, 2024; Tes & Heng, 2024). Creative thinking, problem-solving, and critical thinking are among these skills (Partnership for 21st Century Skills, 2015), and 21st-century conditions also make them mandatory (Chen, 2021). One of the most important skills is creative thinking.

Many researchers have defined what creative thinking is. For example, Doncean and Doncean (2022) define creative thinking as "the process of establishing relationships between things or ideas that have no previous connection" (p. 124). This allows us to evaluate creative thinking as the capacity to produce a new and innovative idea (Özgenel & Çetin, 2017). This capacity is a qualitative ability and a meeting of cognitive potential in every area of daily life. When we consider why and how cognitive actions occur, it can be stated that creative thinking is a higher-order thinking skill. Individual factors, such as self-efficacy, and environmental factors, such as learning environments, come to the fore in the acquisition of higher-order thinking skills. Therefore, creative thinking is also affected by this.

Although there are different approaches in the literature, since this study was carried out with the data of the Programme for International Student Assessment (PISA) 2022 study conducted by the Organisation for Economic Co-operation and Development (OECD), the perspective of this study regarding creativity was discussed. Within the framework of PISA 2022, the concepts of "Participation in creative activities at school (CREATAS)", "Creative thinking self-efficacy (CREATEFF)", "Creative peers and family environment (CREATFAM)", "Participation in creative activities outside of school (CREATOOS)", "Creativity and openness to intellect (CREATOP)", "Creative school and class environment (CREATSCH)", "Imagination and “adventurousness (IMAGINE)”, and “Openness to art and reflection (OPENART)" were discussed regarding creative thinking. The conceptual framework of the study was also created accordingly. In this context, participation in creative activities at school was discussed. Studies show that activities in schools affect creative thinking (Denervaud et al., 2021). When we look at the basis of these participations, it is seen that there are different sources. In the study of Ignatyeva et al. (2018), the tendency to take ownership of project work is more prevalent. They state that art-based activities in high schools increase creativity and creative behaviors. Briguglio et al., (2022) and Egana-delSol (2023) also stated that art-based activities in high schools increase creativity and creative behaviors. Other similar studies are also related to the "Creative school and class environment (CREATSCH)" dimension, which is related to creative thinking within the scope of PISA 2022. Other factors affecting creative thinking are "Creative peers and family environment (CREATFAM)" and "Participation in creative activities outside of school (CREATOOS)" factors outside schools. For example, Fan et al. (2024) found a positive relationship between family involvement and creativity in their meta-analysis study. The group that students interact with the most after their families is their peers. Han et al. (2013) stated that properly structured group work and peer interaction increase creative problem-solving. Park et al. (2023) stated that peer connectedness affects students' creative problem-solving abilities in

the "Students' Creative They state that students with Problem-Finding Ability have more influence than their teachers and families. Pi et al. (2025) state that collaborative peer interaction increases creativity.

Activities aimed at creative thinking also affect affective characteristics related to creativity. One of these is self-efficacy. Self-efficacy is defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). The first source that affects self-efficacy the most is the successful experiences experienced by individuals (Bandura, 1986). As successful experiences increase, self-efficacy increases, and desired actions or behaviors can be observed. Beghetto (2006) states in his study that students with creative self-efficacy also have high academic success. Other affective characteristics are not included in the literature as they are in PISA 2022. However, when the item structures of the dimensions are examined, it is seen that there are some indirect studies on the "Creativity and openness to intellect (CREATOP)" dimension in the literature. For example, Hardy et al. (2017) state that there is a positive relationship between curiosity and creative problem-solving. Again, studies are showing that there is a relationship between both concepts (Ivcevic & Brackett, 2015). There is also a "novelty-seeking" mechanism underneath (Ivancovsky et al., 2024). This understanding is related to the "Imagination and adventurousness (IMAGINE)" structure, which is related to creativity and included in this study. Simonton (2016) also states in his study that structures such as "imagination," "irrationality," and "fantasy" affect creativity. Another structure that is considered is "Openness to art and reflection (OPENART)". According to Richards (2007), being interested in art affects creativity. In this context, openness to art appears as an important structure.

Academic achievements in studies on these structures are generally cognitive and are related to the average of mathematics, science, or all student courses. Here, it can be said that creative thinking allows actions such as changing the individual's perspective and addressing the subject from the perspectives of different individuals (Yang & Hung, 2021). As a result, individuals' academic achievements can increase. However, academic achievement alone is not enough today. In many internationally published reports (Partnership for 21st Century Skills, 2015; Future of Education and Skills 2030 Concept Note on Skills, 2019), "skill" comes to the fore. Again, although not included in this study, the concept of "skill framework" has become one of the main elements of the Turkey Century Education Model announced in 2024 in Türkiye (Ministry of National Education, 2024). In today's world, the concept of skill comes to the fore.

Skills are classified in different ways but are generally associated with the concept of literacy. Literacy is a coding solution that differs from reading and writing (Güvenç, 2017). While literacy as reading and writing is the ability to read and write, literacy in a functional sense is the ability to read and write in a specific field (Turner, 1993). These skills are considered an important human quality today. One of these skills is financial literacy.

Today, financial literacy is one of the most important features that enable individuals, especially young people, to survive economic conditions (Permatasari & Iftitah, 2023). The OECD defined financial literacy as "knowledge and understanding of financial concepts and risks, and the skills, motivation, and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life" (OECD, 2014). Acquiring these skills at an early age also supports the formation of positive financial behaviors in the future (Pramitasari, Siti Syarah, Risnawati & Shofiyah Tanjung, 2023; Susanti & Kemala, 2023). In this process, individuals will increase their potential to develop effective and adaptable strategies as they gain new experiences. Today, it is recognized that financial literacy encompasses not only knowledge of financial information but also the ability to adapt to changing conditions. This is not something that can be achieved solely with knowledge. It has the potential to support a creative thinking process.

When the literature is examined, it is seen that creative thinking and training towards it have an impact on students' academic success (Özerbaş, 2011; Yang & Zhao, 2021), project production (Karataş & Özcan, 2010), affective characteristics (Şahin, 2023), human capital development (Justina & Emmanuel, 2021) and other subjects and areas. It is possible to increase these studies. However, limited studies exist on the relationship between creative thinking and financial literacy. The concept of creative thinking is a multidimensional structure.

Not only creative thinking but also other factors related to it that support creativity are important. In the PISA 2022 study, Participation in creative activities at school (CREATAS)", "Creative thinking self-efficacy (CREATEFF)",

"Creative peers and family environment (CREATFAM)", "Participation in creative activities outside of school (CREATOOS)", "Creativity and openness to intellect (CREATOP)", "Creative school and class environment (CREATSCH)", "Imagination and The concepts of “adventurousness (IMAGINE)”, and “Openness to art and reflection (OPENART)” were examined. When various structures of creativity, such as imagination, intellectual openness, a creative social environment, and art, come to mind, the question of how these dimensions relate to financial literacy arises. This question awaits in-depth research. Creativity and financial literacy are important because financial literacy is not only about knowledge; it also requires developing different strategies in various financial situations and acting on these strategies. Considering this situation, examining financial literacy and creative thinking becomes paramount.

This type of research aims to investigate the effects of structures related to creative thinking on financial literacy. Financial literacy will also affect the economy, which is a social institution. The social institution that receives input from and gives output to the economy and all other social groups is education. In this context, “education is the preparation of labor, which is the indispensable part of the economy and the basic function of production” (Hatipler, 2019, p. 150). Education policies must be based on data and research to ensure that individuals in production and consumption have proper financial literacy.

Every period of development is important for financial literacy. However, especially in professional acquisition and later processes, individuals close to becoming legal taxpayers and taking on many responsibilities such as money, capital, and property management are usually high school students. Another characteristic of this period is the years when adolescence begins. Especially in this period, the possibility of creative processes to emerge increases with the fluctuation in the dominance of certain brain regions. In this context, revealing which dimensions of creative thinking are related to financial literacy will help clarify how these two concepts intersect. Thus, important data will be provided when creating curriculums. In addition, one of the foundations of curriculum success is paying attention to individual differences.

One of the important individual differences is gender. Studies have revealed that there are differences in creative thinking and performance tasks according to gender (Huang et al., 2020; Yıldız & Yıldız, 2021). In parallel with this situation, it was decided to examine the analyses made in this study according to gender.

Methods

This study section includes the research model, participants, data collection tools, and data analysis.

Research Model

This study was a quantitative study conducted to determine how various factors related to creative thinking predict students' financial literacy scores. In this context, the relational survey model was used. With this model, any intervention that would create an effect is avoided, and the relationship, if any, in the existing situation, along with its degree and prediction, is attempted to be determined.

Participants

This study used data from students in countries participating in the Financial Literacy section of the PISA 2022 study. At the same time, data from students who did not respond to all study variables were not included in the study. In this context, the number of participants included in the study is presented in Table 1.

Table 1. Participations structures

Countries	Gender	General Regression Participations	Gender Regression Participations
Austria	Female	2528	1289
	Male		1239
Belgium	Female	1561	808
	Male		753
Brazil	Female	3198	1618
	Male		1580
Bulgaria	Female	2052	953
	Male		1099
Canada	Female	6385	3340
	Male		3030
Costa Rica	Female	2425	1197
	Male		1228
Czech Republic	Female	3286	1589
	Male		1697
Denmark	Female	1651	767
	Male		884
Hungary	Female	2404	1185
	Male		1219
Italy	Female	3853	1837
	Male		2016
Netherlands	Female	2114	1007
	Male		1107
Poland	Female	2410	1214
	Male		1196
Portugal	Female	2619	1311
	Male		1308
Saudi Arabia	Female	2561	1444
	Male		1117
United Arab Emirates	Female	9466	4934
	Male		4532

Upon examining Table 1, it is evident that there are fewer participants in Canada, particularly in terms of gender. These participants (15) did not specify their gender, so they were excluded from the gender analysis but included in other collective analyses.

Data Collection Tools

The study's data were collected from students in participating countries as part of the PISA 2022 study and the financial literacy survey. The dependent variable is the financial literacy performance of students measured through plausible values. The independent variables are the questionnaires about creative thinking that the students completed. The data obtained from these questionnaires are then converted into standardised scales. Information on these surveys (OECD, 2024) is presented below.

Participation in creative activities at school (CREATAS)

In this questionnaire, students were asked how often they participate in the creative activities available at their school (e.g. 'Art classes/activities (e.g. painting, drawing)', 'Discussion club'). The 8-question questionnaire was evaluated as 'Never or rarely', 'About once or twice a year', 'About once or twice a month', 'About once or twice a week', 'Every day or almost every day') and an additional response option 'Not available at school'.

Creative thinking self-efficacy (CREATEFF)

In this questionnaire, students were asked about their self-belief in generating new ideas or thoughts about a task, action, or activity. The scale has 10 items. Students scored as 'Not at all confident', 'Not very confident', 'Confident', or 'Very confident'.

Creative peers and family environment (CREATFAM)

In this questionnaire, we attempted to determine students' perceptions of support from their peers and family for creative thinking. The scale consists of 6 items. It was scored as 'Strongly disagree', 'Disagree', 'Agree', 'Strongly agree'.

Participation in creative activities outside of school (CREATOOS)

In this questionnaire, students were asked how often they participate in activities related to creativity. The scale consists of 8 items. 'Never or almost never', "About once or twice a year", "About once or twice a month", "About once or twice a week", "Every day or almost every day".

Creativity and openness to intellect (CREATOP)

This questionnaire collects the students' views about themselves in relation to creativity and openness to intelligence (e.g., "Doing something creative satisfies me."). The questionnaire has 10 items. It is scored as 'Strongly disagree', 'Disagree', 'Agree', or 'Strongly agree'.

Creative school and class environment (CREATSCH)

This questionnaire questioned students' perceptions about whether creative thinking is supported in their classrooms and schools. It consists of six items, each scored as 'Strongly disagree', 'Disagree', 'Agree', or 'Strongly agree'.

Imagination and adventurousness (IMAGINE)

In this questionnaire, students' views about themselves in terms of imagination and adventurousness (e.g., "I have difficulty using my imagination") were collected. The questionnaire consisted of 7 items. Scored as 'Strongly disagree', 'Disagree', 'Agree', 'Strongly agree'.

Openness to art and reflection (OPENART)

In this questionnaire, students' views about themselves in terms of reflecting their thoughts and experiences with art (e.g., "I enjoy creating art.", "I reflect on movies I watch.") were taken. The questionnaire consists of 5 items. It was scored as 'Strongly disagree', 'Disagree', 'Agree', 'Strongly agree'.

PISA 2022 financial literacy assessment

The scale created for financial literacy consists of 3 basic dimensions "Content areas", "Processes" and "Contexts". Each dimension contains 46 items. The "Content areas" dimension includes the sub-factors "Money and transactions", "Planning and managing finances", "Risk and reward" and "Financial landscape". The Processes dimension includes the factors "Identify financial information", "Analyze financial information and situations", "Evaluate financial issues", and "Apply financial knowledge and understanding". The last dimension, "Contexts", includes the factors "Education and work", "Home and family", "Individual" and "Societal".

Data Analysis

In this study, I utilized the advanced IDB Analyzer developed by IEA to conduct secondary analyses based on the PISA 2022 data. This software was chosen for its ability to handle the international large scale of these data and the complexity of measurement processes. I performed multiple regression analyses to determine whether creative thinking and related factors predict financial literacy scores. The analyses were conducted using the listwise method, and the same procedures were applied to gender, albeit with some modifications using the analysis programme. The financial literacy score was used as the dependent variable, calculated using plausible values through the program. The sample size was analysed with weighted data considering the complex sampling design. Since all operations were performed with IDB Analyzer, analyses determining assumptions for multivariate statistics were not performed.

Results

The first sub-problem of this study is to determine the effect of dimensions related to creative thinking in predicting the financial literacy of all students in general. For this purpose, multiple regression was performed for each, and the results are presented in Table 2.

Table 2. Regression analysis results for all students

Countries	Factors	*B*	*SE*	β	t	R^2
Austria	Constant	524,82	3,04			
	CREATAS	-2,50	2,04	-0,03	-1,23	
	CREATEFF	-0,90	2,63	-0,01	-0,34	
	CREATFAM	11,34	1,99	0,13	5,69***	
	CREATOOS	-27,65	2,44	-0,29	-11,41***	0,15
	CREATOP	16,25	2,73	0,17	6,09***	
	CREATSCH	-5,79	2,41	-0,06	-2,43*	
	IMAGINE	5,02	2,67	0,05	1,89	
	OPENART	-1,11	2,50	-0,01	-0,44	
Belgium	Constant	531,27	4,35			
	CREATAS	1,21	4,39	0,01	0,28	
	CREATEFF	-5,82	3,87	-0,06	-1,50	
	CREATFAM	2,54	3,34	0,02	0,76	
	CREATOOS	-16,10	4,14	-0,15	-3,83***	0,09
	CREATOP	3,17	4,52	0,03	0,70	
	CREATSCH	-4,83	3,86	-0,04	-1,25	
	IMAGINE	26,48	3,79	0,27	7,00***	
	OPENART	-4,23	3,29	-0,04	-1,28	
Brazil	Constant	452,89	3,33			
	CREATAS	-8,72	2,87	-0,10	-3,07**	
	CREATEFF	6,68	2,04	0,07	3,27**	
	CREATFAM	12,80	3,10	0,12	4,18***	
	CREATOOS	-17,42	2,78	-0,21	-6,34***	0,12
	CREATOP	9,76	3,06	0,09	3,21**	
	CREATSCH	-3,39	2,32	-0,03	-1,46	
	IMAGINE	8,33	2,35	0,08	3,53***	
	OPENART	-3,46	2,71	-0,03	-1,28	
Bulgaria	Constant	462,05	4,35			
	CREATAS	-9,67	3,15	-0,11	-3,02**	
	CREATEFF	8,66	2,75	0,09	3,15**	
	CREATFAM	12,20	2,78	0,14	4,44***	
	CREATOOS	-18,16	3,26	-0,21	-5,81***	0,19
	CREATOP	6,70	3,17	0,07	2,15*	
	CREATSCH	-6,48	2,21	-0,07	-2,98**	
	IMAGINE	9,16	3,05	0,10	2,99**	
	OPENART	8,18	3,26	0,08	2,48*	
Canada	Constant	534,94	2,49			
	CREATAS	-6,58	2,32	-0,07	-2,73*	
	CREATEFF	-9,62	2,37	-0,10	-4,09***	
	CREATFAM	2,28	2,10	0,02	1,08	
	CREATOOS	-6,26	2,71	-0,06	-2,32*	0,05
	CREATOP	19,52	2,46	0,20	8,14***	
	CREATSCH	1,34	2,11	0,01	0,64	
	IMAGINE	5,10	2,21	0,05	2,30*	
	OPENART	-3,77	2,09	-0,04	-1,80	
Costa Rica	Constant	424,78	3,15			
	CREATAS	-0,68	2,29	-0,01	-0,30	
	CREATEFF	-1,28	2,14	-0,02	-0,59	
	CREATFAM	2,85	2,16	0,04	1,32	
	CREATOOS	-16,01	2,44	-0,19	-6,35***	0,07
	CREATOP	10,46	2,24	0,13	4,67***	
	CREATSCH	-6,43	2,42	-0,08	-2,69**	
	IMAGINE	9,95	2,06	0,12	4,80***	
	OPENART	-5,80	2,46	-0,06	-2,36*	
Czech Republic	Constant	509,13	2,66			
	CREATAS	-16,97	3,02	-0,16	-5,63***	
	CREATEFF	-9,42	2,39	-0,09	-3,98***	0,12
	CREATFAM	7,10	2,45	0,07	2,90**	
	CREATOOS	-7,69	3,33	-0,07	-2,31*	

	CREATOP	20,65	2,91	0,18	7,36***	
	CREATSCH	3,14	2,45	0,03	1,28	
	IMAGINE	12,42	2,23	0,12	5,44***	
	OPENART	-1,42	2,16	-0,01	-0,66	
Denmark	Constant	522,22	2,71			
	CREATAS	-9,95	3,85	-0,10	-2,61**	
	CREATEFF	-7,25	3,73	-0,08	-1,97	
	CREATFAM	-3,18	3,68	-0,03	-0,86	
	CREATOOS	-24,40	3,58	-0,26	-6,98***	0,13
	CREATOP	15,06	4,05	0,15	3,77***	
	CREATSCH	4,19	4,15	0,04	1,00	
	IMAGINE	7,90	4,13	0,07	1,93	
	OPENART	-1,59	3,08	-0,02	-0,52	
Hungary	Constant	498,74	3,13			
	CREATAS	9,38	3,93	0,09	2,46*	
	CREATEFF	2,00	2,86	0,02	0,70	
	CREATFAM	11,00	2,53	0,11	4,41***	
	CREATOOS	-32,37	3,59	-0,33	-9,08***	0,13
	CREATOP	9,51	3,36	0,09	2,90**	
	CREATSCH	-5,40	2,73	-0,05	-1,98*	
	IMAGINE	10,78	2,52	0,11	4,35***	
	OPENART	2,54	2,72	0,02	0,94	
Italy	Constant	483,07	3,21			
	CREATAS	-3,89	3,44	-0,04	-1,14	
	CREATEFF	-7,65	3,10	-0,07	-2,50*	
	CREATFAM	10,74	2,18	0,11	5,01***	
	CREATOOS	-17,68	3,47	-0,19	-5,10***	0,09
	CREATOP	8,08	2,95	0,08	2,79**	
	CREATSCH	-7,91	2,58	-0,08	-3,10**	
	IMAGINE	7,84	2,38	0,08	3,35***	
	OPENART	-2,53	2,74	-0,03	-0,92	
Netherlands	Constant	534,44	3,43			
	CREATAS	-11,16	4,70	-0,09	-2,43*	
	CREATEFF	-12,63	3,32	-0,10	-3,78***	
	CREATFAM	10,62	3,31	0,09	3,31***	
	CREATOOS	-21,85	4,52	-0,18	-4,79***	0,13
	CREATOP	9,10	3,42	0,07	2,64**	
	CREATSCH	-4,72	3,59	-0,04	-1,33	
	IMAGINE	26,25	3,33	0,22	8,56***	
	OPENART	-3,33	3,15	-0,03	-1,06	
Poland	Constant	518,86	2,82			
	CREATAS	-7,33	3,80	-0,07	-1,91	
	CREATEFF	1,41	2,06	0,02	0,68	
	CREATFAM	3,98	3,03	0,04	1,31	
	CREATOOS	-18,76	3,39	-0,19	-5,65***	0,12
	CREATOP	13,47	3,02	0,14	4,55***	
	CREATSCH	3,14	2,83	0,03	1,11	
	IMAGINE	8,22	2,81	0,09	3,02**	
	OPENART	0,77	2,61	0,01	0,30	
Portugal	Constant	494,08	2,72			
	CREATAS	-10,04	3,19	-0,11	-3,10***	
	CREATEFF	-3,49	2,45	-0,04	-1,43	
	CREATFAM	11,50	2,35	0,12	4,93***	
	CREATOOS	-15,09	3,52	-0,17	-4,44***	0,14
	CREATOP	15,09	3,15	0,16	4,90***	
	CREATSCH	-8,19	2,35	-0,09	-3,49***	
	IMAGINE	9,24	2,48	0,10	3,82***	
	OPENART	-7,59	2,40	-0,08	-3,27**	
Saudi Arabia	Constant	420,46	2,70			
	CREATAS	-0,02	2,50	0,00	-0,01	0,08
	CREATEFF	4,01	2,12	0,05	1,89	
	CREATFAM	4,60	1,83	0,07	2,50*	

	CREATOOS	-10,24	2,70	-0,14	-3,77***	
	CREATOP	7,03	1,81	0,10	3,95***	
	CREATSCH	4,88	2,03	0,07	2,39*	
	IMAGINE	4,82	1,77	0,07	2,73***	
	OPENART	-5,19	2,07	-0,07	-2,50*	
United Arab Emirates	Constant	475,20	2,14			
	CREATAS	-3,98	2,04	-0,04	-1,95	
	CREATEFF	4,76	2,03	0,04	2,35*	
	CREATFAM	13,43	1,78	0,13	7,53***	
	CREATOOS	-28,15	1,76	-0,29	-16,15***	0,17
	CREATOP	9,56	1,72	0,09	5,59***	
	CREATSCH	1,78	1,84	0,02	0,97	
	IMAGINE	15,84	1,79	0,14	8,87***	
	OPENART	-9,05	2,09	-0,07	-4,31***	
Table Average	Constant	492,46	0,81			
	CREATAS	-5,39	0,84	-0,05	-6,30***	
	CREATEFF	-2,04	0,70	-0,02	-2,48*	
	CREATFAM	7,59	0,68	0,08	11,46***	
	CREATOOS	-18,52	0,84	-0,20	-22,54***	0,12
	CREATOP	11,56	0,79	0,12	15,10***	
	CREATSCH	-2,31	0,71	-0,02	-3,24**	
	IMAGINE	11,16	0,70	0,11	15,80***	
	OPENART	-2,51	0,69	-0,03	-3,66***	

** p < 0.05 ($t_{critical}$ = 1.96); ** p < 0.01 ($t_{critical}$ = 2.58); *** p < 0.001 ($t_{critical}$ = 3.29)* ***CREATAS:*** *Participation in creative activities at school* ***CREATEFF:****Creative thinking self-efficacy* ***CREATFAM:*** *Creative peers and family environment* ***CREATOOS****: Participation in creative activities outside of school* ***CREATOP****: Creativity and openness to intellect* ***CREATSCH:*** *Creative school and class environment* ***IMAGINE:*** *Imagination and adventurousness* ***OPENART:*** *Openness to art and reflection*

According to Table 2, the factors that most strongly predict financial literacy scores across countries are participation in creative activities outside of school (β = -0.20, p < .001), which has an adverse effect, and creativity and intellectual openness (β = 0.12, p < .001), which have a positive effect. In addition, the use of imagination (β = 0.11, p < .001) and a creative family environment (β = 0.08, p < .001) were also significant and positive predictors. On the other hand, it was seen that the openness to arts (OPENART) variable was not a significant predictor in most countries and even exhibited a negative relationship in some countries. When country-level analyses are examined, the strong and negative effect of the "CREATOOS" (creative activities outside of school) variable is striking in countries such as Austria, the Czech Republic, Portugal, and the United Arab Emirates. This finding suggests that students who participate intensively in creative activities outside of school may have relatively lower levels of financial literacy. This situation highlights the need to discuss factors related to the potential financial literacy characteristics of creative activities.

On the other hand, the variable "CREATOP" (creativity and intellectual openness) stands out as a positive and significant predictor in many countries (e.g., Canada: β = 0.20***, Italy: β = 0.08**, Netherlands: β = 0.07**). This finding suggests that an individual's openness to creative thinking has a positive impact on the development of financial literacy. The regression models' explanatory power levels (R^2 values) are generally low, ranging from 5% to 19%. This situation illustrates that numerous variables influence financial literacy, with a limited yet significant impact from factors related to creative thinking in this area. Overall, the findings suggest that specific dimensions of creative thinking, primarily intellectual openness, imagination use, and a supportive social environment, may have positive relationships with financial literacy. In contrast, others (e.g. excessive participation in out-of-school creative activities) may have negative relationships. These differences should be considered in conjunction with factors such as cultural context, educational systems, the content of activities, and student profiles.

The second sub-problem of the research is similar to the first sub-problem, and the same model should be considered separately according to the gender factor. The multiple regression results conducted for this purpose are presented in Table 3.

Table 3. Regression analysis results based on gender

Countries	Gender	Factors	*B*	*SE*	β	t	R^2
Austria	Female	(CONSTANT)	512,95	3,82			
		CREATAS	0,01	2,89	0,00	0,00	
		CREATEFF	-0,76	3,84	-0,01	-0,20	
		CREATFAM	14,48	2,64	0,18	5,46***	
		CREATOOS	-24,69	3,08	-0,26	-8,25***	0,15
		CREATOP	13,17	3,90	0,15	3,46***	
		CREATSCH	-14,42	3,20	-0,16	-4,64***	
		IMAGINE	-0,17	3,61	0,00	-0,05	
		OPENART	10,65	3,24	0,12	3,24**	
	Male	(CONSTANT)	534,95	4,84			
		CREATAS	-2,56	2,89	-0,03	-0,89	
		CREATEFF	-2,14	3,26	-0,02	-0,66	
		CREATFAM	9,74	3,73	0,10	2,60**	
		CREATOOS	-32,66	3,78	-0,33	-8,53***	0,2
		CREATOP	16,64	3,62	0,16	4,69***	
		CREATSCH	1,86	3,60	0,02	0,52	
		IMAGINE	10,40	3,50	0,10	3,00**	
		OPENART	-6,60	3,76	-0,06	-1,75	
Belgium	Female	(CONSTANT)	527,68	4,71			
		CREATAS	-5,06	5,25	-0,05	-0,94	
		CREATEFF	-6,42	5,81	-0,06	-1,10	
		CREATFAM	5,14	4,03	0,05	1,27	
		CREATOOS	-1,01	4,81	-0,01	-0,21	0,06
		CREATOP	-5,83	5,74	-0,06	-1,02	
		CREATSCH	-8,63	4,86	-0,07	-1,78	
		IMAGINE	22,87	4,85	0,23	4,85***	
		OPENART	5,91	4,74	0,06	1,25	
	Male	(CONSTANT)	532,27	5,51			
		CREATAS	14,81	5,49	0,14	2,74	
		CREATEFF	-7,13	5,24	-0,07	-1,37	
		CREATFAM	0,47	4,65	0,00	0,10	
		CREATOOS	-33,66	6,01	-0,32	-5,74***	0,15
		CREATOP	9,51	6,80	0,09	1,38	
		CREATSCH	-0,26	5,10	0,00	-0,05	
		IMAGINE	27,02	4,78	0,26	5,91***	
		OPENART	-9,43	4,10	-0,10	-2,30*	
Brazil	Female	(CONSTANT)	448,31	4,30			
		CREATAS	-11,14	3,41	-0,12	-3,26**	
		CREATEFF	7,36	2,36	0,08	3,10**	
		CREATFAM	19,06	3,88	0,17	5,20***	
		CREATOOS	-17,34	3,64	-0,21	-4,96***	0,15
		CREATOP	2,03	3,53	0,02	0,57	
		CREATSCH	-8,78	3,22	-0,08	-2,73**	
		IMAGINE	7,75	3,28	0,08	2,39**	
		OPENART	12,73	3,55	0,11	3,62***	
	Male	(CONSTANT)	453,53	4,74			
		CREATAS	-6,63	4,45	-0,07	-1,48	0,12
		CREATEFF	4,08	3,14	0,04	1,30	

		CREATFAM	8,96	4,10	0,08	2,18	
		CREATOOS	-17,22	3,96	-0,21	-4,38***	
		CREATOP	16,22	4,52	0,15	3,71***	
		CREATSCH	0,79	3,03	0,01	0,26	
		IMAGINE	7,35	3,87	0,07	1,85	
		OPENART	-14,99	4,07	-0,13	-3,71***	
Bulgaria	Female	(CONSTANT)	452,48	4,59			0,21
		CREATAS	-9,33	4,15	-0,10	-2,22*	
		CREATEFF	6,69	3,29	0,08	2,05*	
		CREATFAM	14,50	3,48	0,17	4,31***	
		CREATOOS	-15,02	3,73	-0,17	-4,19***	
		CREATOP	3,01	4,14	0,03	0,73	
		CREATSCH	-6,05	3,29	-0,07	-1,84	
		IMAGINE	10,22	3,57	0,12	2,90**	
		OPENART	13,25	3,88	0,13	3,34***	
	Male	(CONSTANT)	469,30	5,47			0,18
		CREATAS	-10,37	4,41	-0,11	-2,34*	
		CREATEFF	10,16	3,60	0,10	2,83**	
		CREATFAM	10,76	4,23	0,11	2,56*	
		CREATOOS	-20,50	4,44	-0,23	-4,71***	
		CREATOP	8,49	4,72	0,08	1,80	
		CREATSCH	-6,42	3,09	-0,07	-2,10*	
		IMAGINE	9,38	4,49	0,10	2,11*	
		OPENART	6,54	4,75	0,06	1,38	
Canada	Female	(CONSTANT)	526,82	3,31			0,02
		CREATAS	-4,31	2,93	-0,04	-1,44	
		CREATEFF	-4,70	3,55	-0,05	-1,33	
		CREATFAM	2,19	2,57	0,02	0,85	
		CREATOOS	-1,91	3,23	-0,02	-0,59	
		CREATOP	10,42	3,78	0,12	2,81**	
		CREATSCH	-3,20	2,77	-0,04	-1,16	
		IMAGINE	1,83	2,76	0,02	0,66	
		OPENART	4,03	2,90	0,04	1,38	
	Male	(CONSTANT)	541,06	2,85			0,09
		CREATAS	-8,41	3,92	-0,09	-2,11*	
		CREATEFF	-15,91	3,44	-0,15	-4,64***	
		CREATFAM	4,56	3,50	0,04	1,30	
		CREATOOS	-9,28	4,18	-0,09	-2,20*	
		CREATOP	25,81	3,11	0,25	8,26***	
		CREATSCH	5,40	3,14	0,05	1,73	
		IMAGINE	9,74	3,43	0,09	2,84**	
		OPENART	-5,38	3,42	-0,05	-1,56	
Costa Rica	Female	(CONSTANT)	416,88	3,97			0,08
		CREATAS	-3,21	3,56	-0,04	-0,90	
		CREATEFF	0,90	3,25	0,01	0,27	
		CREATFAM	7,19	2,86	0,09	2,56*	
		CREATOOS	-11,65	3,37	-0,14	-3,43***	
		CREATOP	4,16	3,28	0,05	1,27	
		CREATSCH	-8,62	3,38	-0,11	-2,53*	
		IMAGINE	11,59	3,46	0,14	3,34***	
		OPENART	1,29	3,47	0,01	0,37	

		(CONSTANT)	429,91	4,06			
		CREATAS	1,23	3,96	0,01	0,31	
		CREATEFF	-4,28	3,67	-0,05	-1,16	
		CREATFAM	-0,60	3,03	-0,01	-0,20	
	Male	CREATOOS	-20,43	3,73	-0,24	-5,38***	0,09
		CREATOP	14,67	3,76	0,17	3,91***	
		CREATSCH	-4,17	3,68	-0,05	-1,14	
		IMAGINE	9,58	3,30	0,11	2,96**	
		OPENART	-8,99	3,33	-0,10	-2,78**	
Czech Republic	Female	(CONSTANT)	496,00	3,59			
		CREATAS	-18,37	3,64	-0,17	-5,03***	
		CREATEFF	-12,07	3,62	-0,12	-3,37***	
		CREATFAM	9,42	3,35	0,09	2,84**	
		CREATOOS	-5,26	3,70	-0,05	-1,44	0,11
		CREATOP	16,44	3,95	0,15	4,28***	
		CREATSCH	1,82	3,45	0,02	0,53	
		IMAGINE	11,16	3,26	0,10	3,42***	
		OPENART	12,14	3,35	0,11	3,69***	
	Male	(CONSTANT)	518,28	3,64			
		CREATAS	-15,03	4,92	-0,14	-3,04**	
		CREATEFF	-9,96	3,47	-0,10	-2,90*	
		CREATFAM	7,42	3,48	0,07	2,16*	
		CREATOOS	-10,89	5,16	-0,10	-2,11*	0,14
		CREATOP	20,68	4,32	0,18	4,87***	
		CREATSCH	2,72	3,42	0,03	0,79	
		IMAGINE	15,17	2,92	0,14	5,12***	
		OPENART	-4,75	3,67	-0,04	-1,29	
Denmark	Female	(CONSTANT)	514,26	4,10			
		CREATAS	-2,93	5,17	-0,03	-0,56	
		CREATEFF	-12,03	5,00	-0,14	-2,45*	
		CREATFAM	-1,88	5,27	-0,02	-0,36	
		CREATOOS	-26,99	5,89	-0,26	-4,96***	0,11
		CREATOP	14,60	5,61	0,15	2,69**	
		CREATSCH	9,70	5,65	0,09	1,71	
		IMAGINE	4,60	4,63	0,04	1,00	
		OPENART	9,42	5,27	0,10	1,78	
	Male	(CONSTANT)	530,43	4,14			
		CREATAS	-13,92	5,09	-0,15	-2,78**	
		CREATEFF	-3,96	5,45	-0,04	-0,73	
		CREATFAM	-2,20	5,21	-0,02	-0,42	
		CREATOOS	-24,37	4,48	-0,27	-5,62***	0,18
		CREATOP	11,37	5,38	0,11	2,15*	
		CREATSCH	-1,61	4,91	-0,01	-0,33	
		IMAGINE	13,39	5,93	0,11	2,27*	
		OPENART	-3,54	3,74	-0,04	-0,96	
Hungary	Female	(CONSTANT)	480,42	3,58			
		CREATAS	6,94	5,32	0,07	1,33	
		CREATEFF	4,46	3,84	0,05	1,18	
		CREATFAM	15,43	3,48	0,17	4,48***	0,16
		CREATOOS	-29,59	4,18	-0,30	-7,28***	
		CREATOP	8,32	4,70	0,08	1,77	

		CREATSCH	-15,26	3,63	-0,15	-4,09***	
		IMAGINE	4,22	3,37	0,04	1,26	
		OPENART	17,01	4,14	0,16	4,14***	
	Male	(CONSTANT)	512,60	4,28			0,17
		CREATAS	11,50	5,11	0,11	2,30*	
		CREATEFF	-4,78	3,95	-0,04	-1,22	
		CREATFAM	12,80	4,07	0,12	3,18**	
		CREATOOS	-34,90	5,07	-0,37	-6,39***	
		CREATOP	5,35	5,14	0,05	1,05	
		CREATSCH	-0,43	3,32	0,00	-0,13	
		IMAGINE	19,10	3,49	0,18	5,78***	
		OPENART	-1,87	4,00	-0,02	-0,46	
Italy	Female	(CONSTANT)	470,79	3,83			0,07
		CREATAS	-4,14	4,29	-0,04	-0,96	
		CREATEFF	-5,82	3,50	-0,06	-1,68	
		CREATFAM	11,41	3,04	0,13	3,82***	
		CREATOOS	-13,84	4,37	-0,14	-3,11**	
		CREATOP	3,37	4,05	0,04	0,83	
		CREATSCH	-11,44	3,66	-0,12	-3,21**	
		IMAGINE	5,29	3,40	0,06	1,57	
		OPENART	6,42	3,96	0,06	1,64	
	Male	(CONSTANT)	495,08	3,87			0,14
		CREATAS	-3,30	4,74	-0,04	-0,69	
		CREATEFF	-7,77	5,30	-0,07	-1,47	
		CREATFAM	10,40	3,20	0,10	3,31***	
		CREATOOS	-22,54	4,87	-0,25	-4,68***	
		CREATOP	6,16	4,15	0,06	1,50	
		CREATSCH	-5,11	3,33	-0,05	-1,54	
		IMAGINE	13,95	3,39	0,14	4,27***	
		OPENART	-2,14	3,71	-0,02	-0,58	
Netherlands	Female	(CONSTANT)	526,04	4,35			0,11
		CREATAS	-23,22	5,23	-0,18	-4,55***	
		CREATEFF	-17,94	4,55	-0,15	-3,90***	
		CREATFAM	12,58	3,98	0,11	3,27**	
		CREATOOS	-11,28	6,28	-0,09	-1,78	
		CREATOP	9,27	5,96	0,07	1,55	
		CREATSCH	-9,57	4,88	-0,07	-2,01	
		IMAGINE	16,49	5,13	0,14	3,25**	
		OPENART	8,16	5,19	0,06	1,56	
	Male	(CONSTANT)	543,20	4,68			0,18
		CREATAS	1,20	6,37	0,01	0,19	
		CREATEFF	-11,13	4,52	-0,09	-2,48*	
		CREATFAM	12,35	4,68	0,10	2,65**	
		CREATOOS	-34,57	5,29	-0,30	-6,28***	
		CREATOP	6,21	5,04	0,05	1,22	
		CREATSCH	-1,63	4,70	-0,01	-0,35	
		IMAGINE	35,66	4,59	0,30	8,28***	
		OPENART	-5,57	4,77	-0,05	-1,17	
Poland	Female	(CONSTANT)	514,09	3,83			0,1
		CREATAS	-7,14	5,37	-0,07	-1,32	
		CREATEFF	0,45	2,72	0,01	0,17	

		CREATFAM	5,42	3,22	0,07	1,66	
		CREATOOS	-15,37	4,79	-0,16	-3,24**	
		CREATOP	13,86	4,35	0,16	3,29**	
		CREATSCH	0,96	3,08	0,01	0,31	
		IMAGINE	4,19	2,68	0,05	1,57	
		OPENART	3,10	3,19	0,04	0,98	
	Male	(CONSTANT)	525,39	4,58			
		CREATAS	-7,59	5,06	-0,07	-1,49	
		CREATEFF	1,58	3,36	0,02	0,47	
		CREATFAM	3,61	4,41	0,03	0,82	
		CREATOOS	-21,84	5,09	-0,22	-4,39***	0,14
		CREATOP	10,76	4,38	0,10	2,49*	
		CREATSCH	4,07	4,17	0,04	0,98	
		IMAGINE	13,83	4,98	0,13	2,84**	
		OPENART	1,95	4,15	0,02	0,47	
Portugal	Female	(CONSTANT)	483,51	3,81			
		CREATAS	-11,89	4,12	-0,12	-2,85**	
		CREATEFF	-6,28	3,59	-0,07	-1,78	
		CREATFAM	16,34	3,35	0,18	4,75***	
		CREATOOS	-15,01	4,53	-0,15	-3,50***	0,14
		CREATOP	15,82	4,35	0,17	3,79***	
		CREATSCH	-9,59	3,30	-0,10	-2,91**	
		IMAGINE	4,57	3,47	0,05	1,33	
		OPENART	3,28	3,51	0,03	0,94	
	Male	(CONSTANT)	503,04	3,43			
		CREATAS	-8,07	4,82	-0,10	-1,68	
		CREATEFF	-2,84	3,21	-0,03	-0,88	
		CREATFAM	8,29	4,16	0,08	2,02*	
		CREATOOS	-16,79	5,10	-0,21	-3,24**	0,17
		CREATOP	10,23	4,43	0,10	2,32*	
		CREATSCH	-7,22	3,32	-0,07	-2,20*	
		IMAGINE	17,26	3,45	0,17	5,23***	
		OPENART	-10,33	3,42	-0,10	-3,14**	
Saudi Arabia	Female	(CONSTANT)	414,97	3,51			
		CREATAS	-0,21	4,21	0,00	-0,05	
		CREATEFF	2,28	2,46	0,03	0,92	
		CREATFAM	4,97	2,68	0,08	1,86	
		CREATOOS	-10,41	4,34	-0,15	-2,38*	0,07
		CREATOP	3,18	2,83	0,05	1,13	
		CREATSCH	3,73	2,42	0,06	1,53	
		IMAGINE	5,70	2,65	0,09	2,14*	
		OPENART	-0,23	2,80	0,00	-0,08	
	Male	(CONSTANT)	431,34	4,91			
		CREATAS	-0,63	3,27	-0,01	-0,20	
		CREATEFF	5,91	3,40	0,08	1,74	
		CREATFAM	7,29	2,94	0,09	2,49*	
		CREATOOS	-11,99	3,54	-0,16	-3,41***	0,12
		CREATOP	9,81	2,81	0,13	3,49***	
		CREATSCH	6,03	3,44	0,08	1,75	
		IMAGINE	6,05	2,49	0,08	2,45*	
		OPENART	-7,42	3,42	-0,09	-2,15*	

United Arab Emirates	Female	(CONSTANT)	462,69	2,65			0,14
		CREATAS	-1,34	2,67	-0,01	-0,50	
		CREATEFF	7,31	2,57	0,07	2,84**	
		CREATFAM	13,69	2,25	0,14	6,11***	
		CREATOOS	-26,63	2,35	-0,28	-11,66***	
		CREATOP	0,27	2,53	0,00	0,10	
		CREATSCH	-0,66	2,41	-0,01	-0,27	
		IMAGINE	12,25	2,50	0,11	4,95***	
		OPENART	3,77	2,83	0,03	1,33	
	Male	(CONSTANT)	485,20	3,23			0,21
		CREATAS	-6,59	2,88	-0,06	-2,29*	
		CREATEFF	0,96	2,54	0,01	0,38	
		CREATFAM	15,21	2,96	0,13	5,08***	
		CREATOOS	-29,26	2,80	-0,29	-10,80***	
		CREATOP	14,82	2,56	0,13	5,80***	
		CREATSCH	3,67	2,93	0,03	1,25	
		IMAGINE	19,67	2,31	0,17	8,42***	
		OPENART	-14,10	3,01	-0,10	-4,67***	
Table Average	Female	(CONSTANT)	483,19	1,01			0,11
		CREATAS	-6,36	1,10	-0,06	-5,36**	
		CREATEFF	-2,44	0,96	-0,02	-2,16*	
		CREATFAM	10,00	0,88	0,11	11,64**	
		CREATOOS	-15,07	1,10	-0,16	-14,43***	
		CREATOP	7,47	1,11	0,08	6,98***	
		CREATSCH	-5,33	0,94	-0,05	-5,70***	
		IMAGINE	8,17	0,93	0,08	8,74***	
		OPENART	7,39	0,98	0,07	7,32***	
	Male	(CONSTANT)	500,37	1,12			0,15
		CREATAS	-3,62	1,18	-0,04	-3,15**	
		CREATEFF	-3,15	1,01	-0,03	-2,80**	
		CREATFAM	7,27	1,02	0,07	7,23***	
		CREATOOS	-22,73	1,18	-0,24	-18,97***	
		CREATOP	12,45	1,15	0,12	11,12***	
		CREATSCH	-0,15	0,97	0,00	-0,12	
		IMAGINE	15,17	1,01	0,14	15,14***	
		OPENART	-5,77	0,99	-0,05	-5,79***	

** p < 0.05 ($t_{critical}$ = 1.96); ** p < 0.01 ($t_{critical}$ = 2.58); *** p < 0.001 ($t_{critical}$ = 3.29)* ***CREATAS:*** *Participation in creative activities at school* ***CREATEFF:****Creative thinking self-efficacy* ***CREATFAM:*** *Creative peers and family environment* ***CREATOOS****: Participation in creative activities outside of school* ***CREATOP****: Creativity and openness to intellect* ***CREATSCH:*** *Creative school and class environment* ***IMAGINE:*** *Imagination and adventurousness* ***OPENART:*** *Openness to art and reflection*

In this study, which utilized PISA 2022 data, the effects of factors related to creative thinking on financial literacy were examined in relation to the gender variable. In multiple regression analyses conducted for 15 different countries, girls and boys were evaluated separately; in both groups, the predictive effects of variables such as participation in creative activities (inside and outside of school), creative thinking self-efficacy, creative social environment, creativity and intellectual openness, creative school environment, imagination and openness to art on financial literacy were analyzed. According to country averages, the variable that most strongly predicted financial literacy scores in girls was participation in creative activities outside of school (CREATOOS; β = -0.16, p < .001), with a negative effect. This variable was followed by creative peer and family environment (CREATFAM; β = 0.11, p < .001), imagination and adventurism (IMAGINE; β = 0.08, p < .001), and creativity and intellectual openness (CREATOP; β = 0.08, p < .001). In female students, openness to arts (OPENART) also stood out as a significant and positive predictor (β = 0.07, p < .001). This

finding suggests that artistic sensitivity and tendencies toward internal reflection may be positively related to financial literacy in female students. On the other hand, some variables, such as creative thinking self-efficacy (CREATEFF) and school environment (CREATSCH), showed weaker or adverse effects. Although a similar pattern was observed in male students, some important differences were noted. Participation in creative activities outside of school (CREATOOS; $\beta = -0.24$, $p < .001$) was also the most potent negative predictor for this group. In addition, imagination and adventurousness (IMAGINE; $\beta = 0.14$, $p < .001$), creativity and intellectual openness (CREATOP; $\beta = 0.12$, $p < .001$), and creative friend-family environment (CREATFAM; $\beta = 0.07$, $p < .001$) were among the significant positive predictors. However, the openness to arts (OPENART) variable emerged as a significant but negative predictor for boys ($\beta = -0.05$, $p < .001$). This suggests that the relationship between the arts and reflective thinking may have different meanings in the context of gender. Additionally, the creative school environment (CREATSCH) variable was not a significant predictor for boys in general. This suggests that the impact of the school environment on the financial literacy of male students is limited.

These findings suggest that certain factors related to creative thinking have an everyday impact on both genders; however, the magnitudes and directions of these effects may vary by gender. In particular, the impact of individual and environmental factors, such as imagination, intellectual openness, and social support, is seen to be more pronounced in boys. At the same time, artistic sensitivity is more pronounced in girls. Taking gender differences into account in policies aimed at developing creative thinking skills in education systems may be an essential strategy for increasing students' financial literacy levels.

Discussion

In this study, firstly in general and then according to gender, the effect of concepts related to creative thinking on financial literacy was analysed by multiple regression and discussed in this section. In general, the findings revealed that certain factors related to creative thinking have a significant impact on financial literacy. In particular, participation in creative out-of-school activities (CREATOOS) is a strong but negative predictor in many countries. This result is a significant finding that needs to be analysed in the context of educational sciences. Although creative activities are generally considered to be positively related to individual development in the literature (Conner, DeYoung & Silvia, 2016; Güvenir, 2023; Žarnauskaitė, 2023), the results of this study show that this relationship may vary depending on the field, i.e., the area of study or profession, and its nature, i.e., its characteristics and requirements. The divergence of our results from the existing literature underscores the need for further investigation into the limitations and unique characteristics of field-oriented out-of-school creative activities. While previous studies have shown that creative activities support general cognitive development (Looi, Wong, So, & Seow, 2009; Özdemir Ürün & Oğuz Atıcı, 2024), the negative effect of out-of-school activities on financial knowledge and skills in this study may be based on the possibility that activities that are not directly related to financial literacy may create negative results. From this perspective, it can be stated that creative thinking activities, especially those outside of school, are essential for the development of financial literacy. However, qualitative research is needed to see the sources of differences between the research results and the literature more clearly.

On the other hand, the positive effects of individual or environmental factors such as creativity and intellectual openness (CREATOP), imagination (IMAGINE) and creative social environment (CREATFAM) on financial literacy indicate that some aspects of creative thinking support success in this area. These results suggest that individuals' openness to generating new ideas, creative problem-solving skills, and social environment support positively affect their financial decision-making processes. Accordingly, creative thinking should be associated with an artistic perspective and daily life skills.

Another question addressed by the research is to examine how the model created differs according to gender. The striking result that stands out in the findings is that the variable of participation in creative activities outside of school (CREATOOS) makes a significant but negative contribution to the model in both girls and boys. A similar situation was revealed in the model produced for all students. Similar to the results obtained in general, it was determined that factors such as imagination (IMAGINE), intellectual openness (CREATOP), and a creative social environment

(CREATFAM) are positive predictors in both genders. On the other hand, the different results that emerged in the context of gender indicate that the dimension of openness to art (OPENART) is positive for girls and negative for boys. This finding can be expressed by the fact that the reflection of art-oriented activities on gender is different, and this difference should be considered in applications.

Conclusion

This study makes a unique contribution to the literature by examining the effect of creative thinking-related factors on determining financial literacy through multiple regression analysis. Remarkably, while the dimensions of creative thinking, especially those related to intellectual openness, imagination and social support, significantly predict financial literacy, on the other hand, it also shows that excessive participation in out-of-school investment activities may have a negative effect. Another prominent aspect of the study is that the above-mentioned findings are based on data from many countries. This has also revealed the effects of cultural context and educational environments by comparing countries. Although data from more than one country is available, the variance explained by the models, in general and in particular, is low. This shows that financial literacy is multidimensional and cannot be explained only by creative thinking. Nevertheless, this study aims to fill the gap in the field by presenting multinational findings on the impact of creative thinking on financial literacy.

In this context, although the effect size and direction differ, it can be stated with certainty that specific dimensions of creative thinking (e.g., imagination, intellectual openness, and social support) have a significant impact on financial literacy for both girls and boys. These results suggest that creativity is associated with processes such as life skills and decision-making and may have a positive impact on financial literacy.

Recommendations

Based on these results, some suggestions can be made. First, it is essential to incorporate concepts of creative thinking, including creative problem-solving, imagination, and intellectual flexibility, into curricula and activities designed to enhance financial literacy. Second, efforts to foster creativity should also include initiatives to enhance financial awareness. This study employs a survey model due to its design. The relationship between creativity and financial literacy can be explored through experimental designs or action research studies. Within the framework of the research's gender-based findings, it can be stated that creative thinking activities for financial literacy should be developed with consideration for gender differences.

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