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INTERGENERATIONAL LEARNING FOR ADULT LEARNERS
THROUGH STEAM: FROM THE POINT OF HOFSTEDE'S 6D MODEL
(STEAM PLUS)



STEAM Literacy Survey and Analysis

IO1:
Culture vs Creativity;
STEAM Literacy Questionnaire



Statement of Responsibility: “This project is funded by the Erasmus+ Program of the European Union. However, European Commission and Turkish National Agency cannot be held responsible for any use which may be made of the information contained therein”

Intergenerational Learning for Adult Learners through STEAM: From the point of Hofstede's 6D Model (STEAM Plus)

Dear Sir and Madam,

We hereby strive to examine your opinion and attitudes regarding International Learning for Adult Learners through STEAM in your country. This survey is anonymous and during its processing, there is no possibility to disclose your personal data. The questionnaire was created by researchers and professors who implement STEAM plus supported by the European Commission. The main goal of this project is to re-systematize the existing practices for adults in the cultural axis for delivering STEAM education to all segments of society in today's world, where technology is at the center of our lives every day. For additional questions, clarifications, or results of this survey you can contact one of the project team members. We appreciate your time.

STEAM LITERACY SURVEY

1) Your age?

.....

2) Your gender?

Male Female

3) Country of residence?

Turkey Austria Finland Other:.....

4) Your monthly income? (optional to respond)

.....

5) Your Education Level?

Primary/Secondary Education High School Associate Degree
 Undergraduate Master Doctorate

6) Your profession status (which one describe best)

Unemployed Self Employed Minimum Wage Employee Full-time Employee Retired

7) Active Working Status?

Yes No

8) What is your level of knowledge about STEAM education? (1 Lowest - 5 Higer)

What is your level from 1 to 5? 1 means the lowest level and 5 means the highest level.

1	2	3	4	5
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9) Which of the fields of Science, Technology, Engineering, Mathematics and Art, which are the parts of STEAM education, do you focus on?

Science Engineering Math Technology Art

10) What is your favorite area in STEAM?

Science Engineering Math Technology Art

11) Have you taken STEAM training before?

Yes No

① Strongly Disagree ② Disagree ③ Undecided ④ Agree ⑤ Strongly Agree

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	Generally I consider myself a creative person	①	②	③	④	⑤
2	In general, new ideas come to my mind	①	②	③	④	⑤
3	I plan things that have never been done before	①	②	③	④	⑤
4	I see myself as a problem solver	①	②	③	④	⑤
5	I can fully describe the requirements of the problem	①	②	③	④	⑤
6	I can choose methods and skills appropriately	①	②	③	④	⑤
7	Applications related to components of STEAM increase my creativity	①	②	③	④	⑤
8	STEAM training supports my critical perspective	①	②	③	④	⑤
9	I am curious about the working mechanism of the tools and vehicles around me, compared to other people, I can easily perceive it	①	②	③	④	⑤
10	I follow new scientific developments and technologies more closely than my peers	①	②	③	④	⑤
11	I use scientific methods and technology at the highest level in my work	①	②	③	④	⑤
12	I quickly gather and organize information about the problem and take action	①	②	③	④	⑤
13	I'm good at building things and fixing them	①	②	③	④	⑤
14	I am interested in designing products or structures is important for future work	①	②	③	④	⑤
15	I am interested in researching and talking about STEAM fields for my future plans	①	②	③	④	⑤
16	I can use my experiences in learning processes	①	②	③	④	⑤
17	I can synthesize and use interdisciplinary knowledge to solve daily problems	①	②	③	④	⑤
18	I prefer to summarize the experience and reflect on the learning process	①	②	③	④	⑤
19	I prefer to use procedures or steps to solve issues	①	②	③	④	⑤
20	Technological devices and topics interest me	①	②	③	④	⑤
21	I believe that art is an important factor in scientific studies	①	②	③	④	⑤
22	STEAM is a promoted approach my country	①	②	③	④	⑤
23	Throughout my education life, I was a student interested in STEAM fields	①	②	③	④	⑤
24	I am interested in the STEAM fields and follow their developments	①	②	③	④	⑤
25	I find it fascinating that people around me solve problems with STEAM applications	①	②	③	④	⑤
26	Professions that include science, mathematics, engineering, technology, and the arts offer the opportunity to succeed in life	①	②	③	④	⑤
27	Science, mathematics, engineering, technology and art improve the quality of our lives	①	②	③	④	⑤
28	Science, mathematics, engineering, technology and art are important for development of our country	①	②	③	④	⑤
29	STEM applications increase the real-life use of these areas	①	②	③	④	⑤
30	I prefer to use multidisciplinary knowledge to solve daily problems	①	②	③	④	⑤
31	I consider the influence of factors on the problem to avoid risk	①	②	③	④	⑤
32	Science, technology, engineering, mathematics and art are very important to my life	①	②	③	④	⑤
33	I can communicate and collaborate with team members	①	②	③	④	⑤
34	Working on STEAM makes people around me happy	①	②	③	④	⑤
35	The purpose of STEAM trainings is to establish relationships between disciplines and to realize learning with a holistic approach	①	②	③	④	⑤
36	I was successful in courses in the STEAM field throughout my education life	①	②	③	④	⑤
37	In general, I consider myself a researcher	①	②	③	④	⑤
38	I can reach and use the right information to reach the solution	①	②	③	④	⑤

WHAT IS STEM/STEAM?

STEM is an acronym that covers the fields of Science, Technology, Engineering and Mathematics. STEM education aims to help students understand the relationships between these disciplines and develop skills such as critical thinking, problem solving and creativity. STEAM is an expansion of STEM and also includes the concept of Arts. This approach believes that art, as well as science and technology, play an important role. The addition of art aims to provide students with creative thinking, aesthetic understanding and design skills.

STEAM, seen as one of the ways to invest in the future for economic prosperity and a good life, has an educational approach that includes many components. This educational approach can be implemented in schools, depending on course curriculum, as well as in after-school STEAM communities. In addition, many processes such as robotic applications, developing your own device or project-oriented production are a method of this educational approach. One of the important reasons for including art in STEM education is to develop the understanding of 'imagination and aesthetics', which is thought to be missing in the education process that engineers and scientists apply to create products or develop projects for the service sector. For example, a student can learn physics, mathematics and biology to create a robot, but he needs art to create the form, shape and aesthetic aspect of his robot. (Mercin, 2019: 28-30).

HOFSTEDE CULTURE DIMENSIONS

Geert, who works as a psychologist at IBM Hofstede conducted extensive cross-cultural research. Hofstede, who aimed to measure cultural differences with his study of 116 thousand employees in 53 countries, including Türkiye, concluded that culture can be explained in four different dimensions. These dimensions are the power distance dimension, uncertainty avoidance dimension, individualism-collectivism dimension and masculinity-femininity dimension. Following criticism that his studies were focused on western culture, he added the dimension of long-short term orientation to the four dimensions as a result of the surveys he conducted on 2,300 students in 23 Asian countries (Kutschker and Schmid, 2011). In his later studies, he added the tolerance-restriction dimension and suggested that culture could be explained in six different dimensions (Hofstede et al. 2010).

Power Distance Dimension

Power distance is related to social inequality, that is, the unequal distribution of power in the inter-individual and social structure of society (Hofstede et al. 2010). In other words, the power distance dimension is defined as the degree to which powerless individuals in society accept that power is not distributed equally. In societies with high power distance, hierarchical structures are more evident and authority is more accepted. In these societies, everyone's social status is clear and individuals are respected according to these statuses (Garcia et al. 2014). Societies with high power distance are resistant to innovation and change (Kumar, 2014). In these societies, those at the top hierarchically do not need to know the truth to be right. The justification of these individuals comes from the power they have (Sargut, 2010).

The power distance dimension manifests itself not only in the workplace, but also in teacher-student relationships in education life or parent-child relationships in family life. In low power distance societies, families raise their children independently from an early age, while in high power distance societies, families raise their children to be obedient, and in these societies, loyalty, respect and devotion to parents are

expected. In low power distance societies, teachers encourage their students to express their opinions freely; In high power distance societies, students are expected to respect their teachers, see their teachers as the source of knowledge, and not question what they say. This situation manifests itself in similar ways in business life and social life. While employees in low power distance societies can share their ideas with their superiors and have a say in the decisions taken, in high power distance societies, managers are expected to act like a good mother or father (paternalism). However, societies with high power distance are closed to innovation compared to societies with low power distance (Halkos and Tzeremes, 2013).

Uncertainty Avoidance Dimension

The uncertainty avoidance dimension is related to the level of anxiety that society feels about situations where information is not sufficient or certain and change cannot be predicted. People face some uncertainties because they do not know the future, and when this uncertainty exceeds a certain level, it causes anxiety in people. Societies resort to methods such as technology, law and religion to overcome these concerns. Technology is used to reduce uncertainties arising from nature; Laws are used to reduce uncertainties that may arise from other people. Religion, on the other hand, is an acceptance against uncertainties from which people cannot protect themselves (Hofstede et al. 2010).

In societies with low tolerance for uncertainty, individuals are more hesitant towards change, the unknown and unexpected situations. These societies are tied to certain patterns of behavior that are difficult to change and are not open to innovation. Their adaptation to new products and services is lower than societies with a high tolerance for uncertainty. In these societies, different views and behaviors are not tolerated and individuals avoid taking risks (Hofstede, 1983). However, individuals want to secure themselves by adhering to written and official rules, procedures and authority.

In societies with a high tolerance for uncertainty, individuals are more open to change. The unknown is a matter of curiosity and more relaxed behavior is exhibited in the face of unexpected situations (Hofstede, 1993). Innovation and change are encouraged in these societies; contrary behaviors and ideas are respected (Yie and Bothello, 2010). In this way, individuals can act more freely and autonomously and make their own decisions instead of obeying or being shaped by social norms. (Hofstede, 2011). In societies where uncertainty is tolerated, there are no strict rules, rules are more flexible and individuals are not afraid to take risks. In this cultural environment, employees are more likely to take initiative, make their own decisions and work as a team, rather than complying with the hierarchical structure and adopting the views of their superiors.

Individualism - Collectivism Dimension

Hofstede, the individualism and collectivism dimensions are related to the relationships of individuals with each other and with society. In societies with high levels of individualism, relationships between individuals are quite weak and individuals only care about themselves and their nuclear families (Hofstede et al. 2010). Individuals growing up in this culture grow up focused on "I" rather than "we". In other words, in individualistic cultures, people pay more attention to their personal goals, private lives and self-improvement. They direct their own lives and focus on self-realization (Hofstede, 2001). In these cultures, individuals' personal interests and goals are above the interests of society (Garcia et al. 2014). In individualistic cultures, people are more likely to make independent decisions and care less about the opinions of their families and those around them when making decisions. Individuals who grow up in individualistic cultures are more open to innovation and change as a result of being more independent when making decisions and being more open to different thoughts and ideas (Taylor and Wilson, 2012). However, people raised in these cultures are more likely to act more rationally before making decisions and to calculate the benefits and losses of the decisions they will make in advance (Hofstede, 2010). Because individualistic

cultures are more interested in competition and self-sufficiency, development and progress are more likely for individuals growing up in these cultures.

In collectivist societies, belonging to a community or group and acting in accordance with the norms of the society or group are more important (Hofstede, 2010). Individuals growing up in these cultures grow up focused on "we" and accept the group or community to which they do not belong as "them". Therefore, the interests of society or the group are prioritized over the interests of individuals. Individuals raised in this culture are expected to keep their own goals in the background. This causes individuals who grow up in collectivist cultures to be more loyal and committed to the group or community they belong to than those who grow up in individualistic cultures. While levels of commitment to groups enable individuals to have greater social mobility in individualistic cultures, allowing individuals to easily leave the groups or communities they belong to and form new groups; In collectivist cultures, social mobility is low and makes it difficult for individuals to voluntarily leave the communities they belong to. While vertical relationships (parent-child) are more important in collectivist societies; In individualistic societies, more importance is given to horizontal relationships (relationship between spouses) (Hofstede, 2010).

Masculinity - Femininity Dimension

Hofstede (2001), while achieving goals such as career and money is important for men, social goals such as establishing good relationships with people, helping others, and protecting the environment are more important for women. This situation is related to the fact that societies expect men to meet economic needs, while women expect them to take care of children (Hofstede, 2001). As a matter of fact, societies' expectations from men and women and the goals of individuals in the society affect whether the culture of that society is masculine or feminine.

In masculine societies, male and female roles are clearly separated. While men in these societies are expected to be more assertive, competitive and materialistic; Women are expected to be more modest, more sensitive, and focused on quality of life rather than materialism (Wilson, 2004, 183). In feminine societies, the roles of men and women overlap. Women and men are expected to be equally humble, sensitive, and quality-of-life oriented (Hofstede, 2001). In this culture, compromise and compromise in solving problems come to the fore instead of competitiveness. However, there are close emotional ties between subordinates and subordinates in organizations.

Success in masculine cultures; While it is measured by high earnings, career, recognition, money and financial opportunities; In feminine cultures, people value good relationships and social well-being more than material things (Hofstede et al. 2010). In masculine cultures, competitiveness is perceived as good and the strong one is expected to win. Returns are expected to be distributed according to performance, and successful people are rewarded. In feminine cultures, social justice is important. Powerful people are expected to help poor or destitute people. The idea of distributing returns according to need, not performance, is adopted. In these cultures, individuals sympathize with weak and needy individuals (Hofstede, 1984). While masculine societies are closer to the expression "living to work" in business life, feminine societies are closer to the expression "working to live" (Hofstede, 2011). While making money in business is important in masculine cultures, working conditions and relationships are important in feminine cultures. According to research, individuals raised in feminine cultures are more inclined to keep up with innovation and changing technology (Waarts and Van Everdingen, 2005).

Long – Short Term Orientation Dimension

This dimension was added as the fifth cultural dimension to express the cultural values of eastern societies as a result of criticism that Hofstede gave too much importance to western values and ignored eastern culture (Bukowski and Rudnicki, 2018). This dimension, also called Confucian Dynamism, was developed as a

result of the application of Chinese Values Survey developed by Michael Harris Bond in Hong Kong in 1985 in 23 different countries (Hofstede and Bond, 1984).

The reason why this dimension is called Confucian Dynamism is that it is similar to the teachings of Confucius. These teachings can be summarized under four headings. The first is that relationships between people should have different statuses (such as father-son, master-apprentice, brother-brother relationship). These relationships require mutual obligations. For example, children should respect their father and obey him; Fathers should also think about and protect their children. The second teaching is that the family must be an example of all social structures. People are perceived as part of the family or society rather than as a separate individual. According to the third title of this doctrine, which is similar to collectivism, people should treat others the same way they want to be treated. The fourth teaching is that what makes a person's life virtuous is trying to be more talented and educated, not spending more than his needs, being patient, being thrifty and working hard (Hofstede et al. 2010).

Hofstede defined the long and short term orientation dimension as the problem of choosing between virtue and reality (Hofstede et al. 2010). While long-term orientation focuses on values such as future, continuity, adaptability and saving; The short-term orientation focuses on values such as past and present values and respect for traditions. While long-term harmonious societies try to build their existing traditional structures on a more modern structure; short-term harmonious societies are more static. Short-term adaptable individuals expect to see immediate results of their investments compared to long-term adaptable individuals.

Tolerance – Restriction Dimension

This dimension was later added to Hofstede's cultural dimensions, such as the long-short term orientation dimension. The tolerance – restriction dimension is based on the World Values Survey conducted by Inglehart in more than 90 countries. It was created as a result of the survey. This dimension focuses on family, happiness, life satisfaction level, economy, politics and other social and ethical values (Hofstede et al. 2010). While permissive cultures attach importance to values such as personal satisfaction and enjoying life by meeting natural human needs; In restrictive cultures, people's behavior is restricted by social norms and rules (Hofstede et al. 2010). In permissive cultures, freedom of expression is an important right and individuals' personal opinions are respected. In restrictive cultures, freedom of expression is less than in permissive cultures, and social norms are more important than personal opinions. In this respect, this dimension is similar to the individualism and collectivist culture dimension.

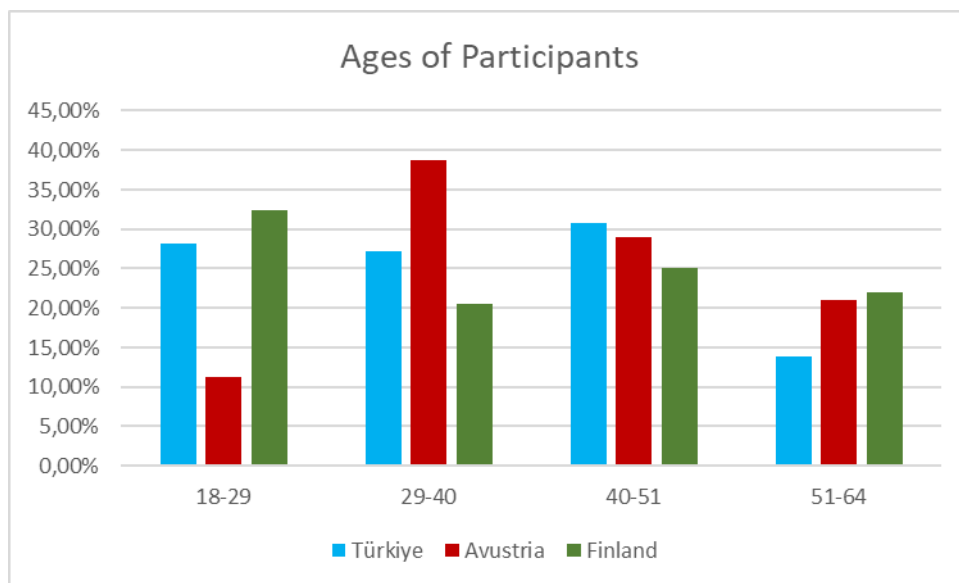
ANALYSIS RESULTS

Descriptive Statistics

Age

	Türkiye		Austria		Finland	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
18-29	342	28.2	7	11.3	22	32.4
29-40	331	27.2	24	38.7	14	20.6
40-51	374	30.8	18	29.0	17	25.0
51-64	168	13.8	13	21.0	15	22.0
Total	1215	100.0	62	100.0	68	100.0

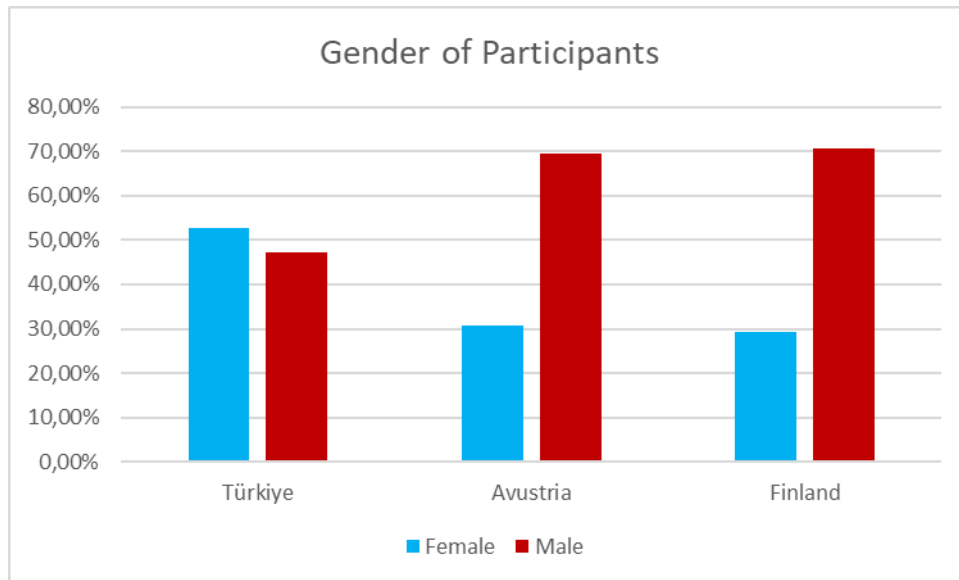
Of the respondents from Türkiye, 20.9% were between the ages of 18-29, 27.2% between the ages of 29-40, 30.8% between the ages of 40-51, and 13.8% between the ages of 51-64. Among the respondents from Austria, 11.3% were between the ages of 18-29, 38.7% between the ages of 29-40, 29% between the ages of 40-51, and 21% between the ages of 51-64. Among the respondents from Finland, 32.4% were between the ages of 18-29, 20.6% were between the ages of 29-40, 25% were between the ages of 40-51, and 22% were between the ages of 51-64.



Gender

	Türkiye		Austria		Finland	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Female	642	52.8	19	30.6	20	29.4
Male	573	47.2	43	69.4	48	70.6
Total	1215	100.0	62	100.0	68	100.0

While 52.8% of the participants in the survey from Türkiye are female, 47.2% are male. While 30.6% of the participants in the survey from Austria are female, 69.4% are male. While 29.4% of the participants in the survey from Finland were female, 70.6% were male.



Country

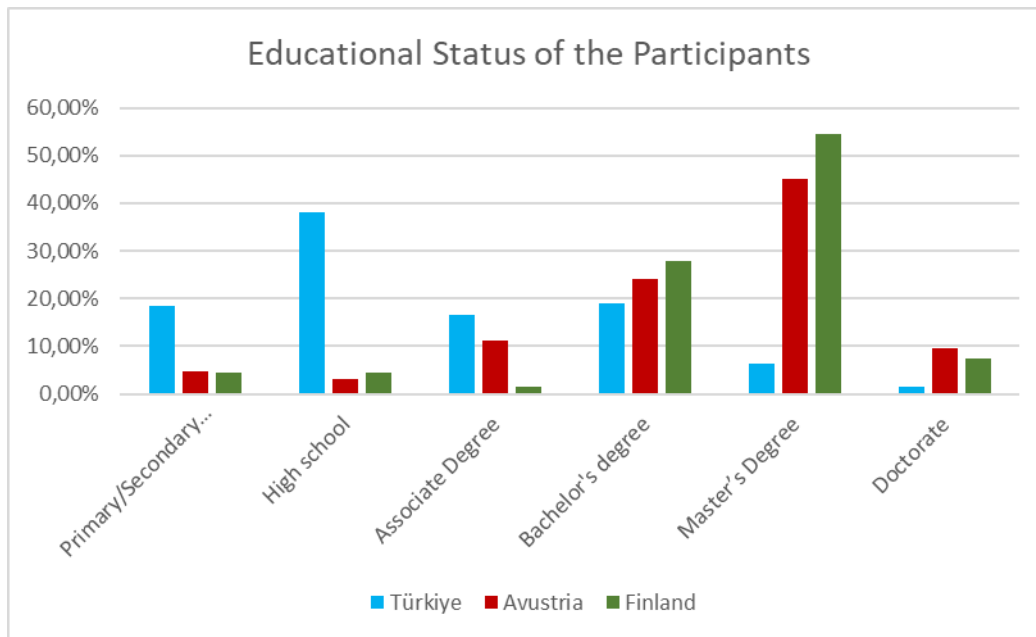
	Frequency	Percentage
Türkiye	1215	90.3
Austria	62	4.6
Finland	68	5.1
Total	1345	100.0

90.3% of those who participated in the survey participated from Türkiye. Moreover 4.6% of the participants are Austrian participants, 5.1% are Finnish participants.

Educational Status

	Türkiye		Austria		Finland	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Primary/Secondary Education	225	18.5	3	4.8	3	4.4
High school	464	38.2	2	3.2	3	4.4
Associate Degree	200	16.5	7	11.3	1	1.5
Bachelor's degree	232	19.1	15	24.2	19	27.9
Master's degree	77	6.3	28	45.2	37	54.4
Doctorate	17	1.4	6	9.7	5	7.4
Total	1215	100.0	62	100.0	68	100.0

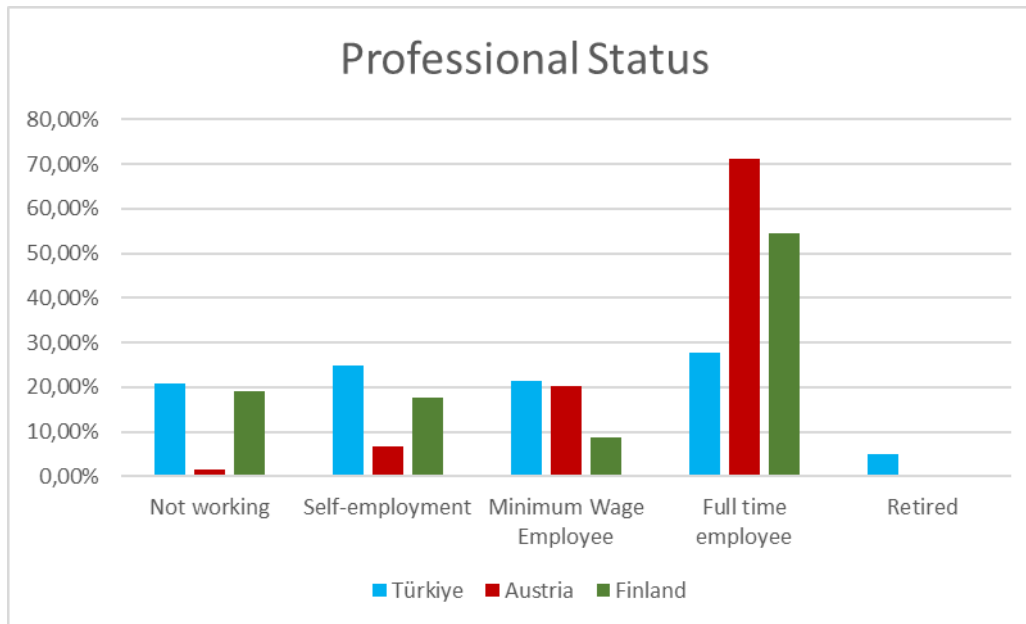
Of the respondents from Türkiye, 18.5% were primary/secondary education graduates, 38.2% were high school graduates, 16.5% were associate degree graduates, 19.1% were bachelor's degree graduates, 6.3% were master's degree graduates and 1.4% were PhD graduates. Among the respondents from Austria, 4.8% were primary/secondary education graduates, 3.2% were high school graduates, 11.3% were associate degree graduates, 24.2% were bachelor's degree graduates, 45.2% were master's degree graduates and 9.7% were PhD graduates. Among the respondents from Finland, 4.4% were primary/secondary school graduates, 4.4% were high school graduates, 1.5% were associate degree graduates, 27.9% were bachelor's degree graduates, 54.4% were master's degree graduates and 7.4% were doctoral degree graduates.



Professional Status

	Türkiye		Austria		Finland	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Not working	254	20,9	1	1,7	13	19,1
Self-employment	303	24,9	4	6,8	12	17,6
Minimum Wage Employee	261	21,4	12	20,3	6	8,8
Full time employee	339	27,8	42	71,2	37	54,4
Retired	61	5,0	0	0	0	0
Total	1218	100,0	59	100,0	68	100,0

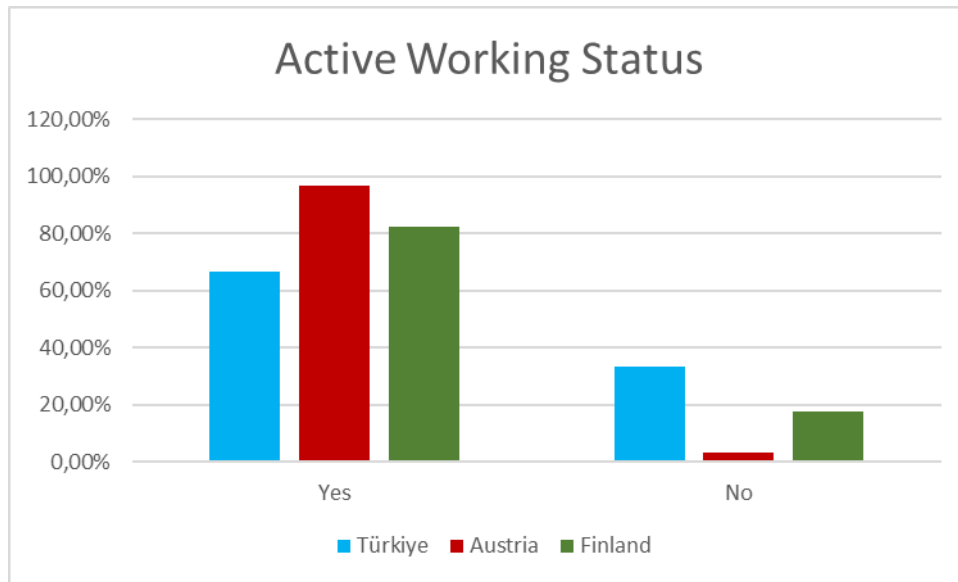
Of the respondents from Türkiye, 20.9% were unemployed, 24.9% were self-employed, 21.4% worked for minimum wage, 27.8% worked full-time and 5% were retired. Among the respondents from Austria, 1.7% stated that they were not working, 6.8% were self-employed, 20.3% worked for minimum wage and 71.2% worked full-time. 19.1% of the respondents from Finland stated that they were not employed, 17.6% were self-employed, 8.8% worked for minimum wage and 54.4% worked full-time.



Active Working Status

	Türkiye		Austria		Finland	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Yes	809	66.5	59	96.7	56	82.4
No	408	33.5	2	3.3	12	17.6
Total	1217	100.0	61	100.0	68	100.0

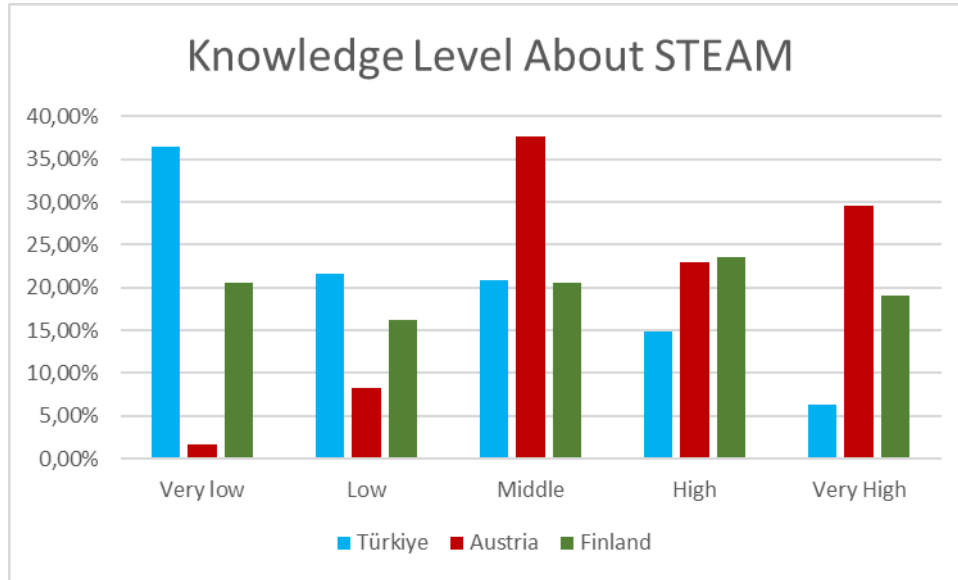
66.5% of the participants from Türkiye, 96.7% from Austria and 82.4% from Finland stated that they were actively working. 33.5% of the participants from Türkiye, 3.3% from Austria and 17.6% from Finland stated that they were not actively working.



Knowledge Level About STEAM

	Türkiye		Austria		Finland	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Very low	443	36.5	1	1.6	14	20.6
Low	262	21.6	5	8.2	11	16.2
Middle	253	20.8	23	37.7	14	20.6
High	180	14.8	14	23.0	16	23.5
Very High	77	6.3	18	29.5	13	19.1
Total	1215	100.0	61	100.0	68	100.0

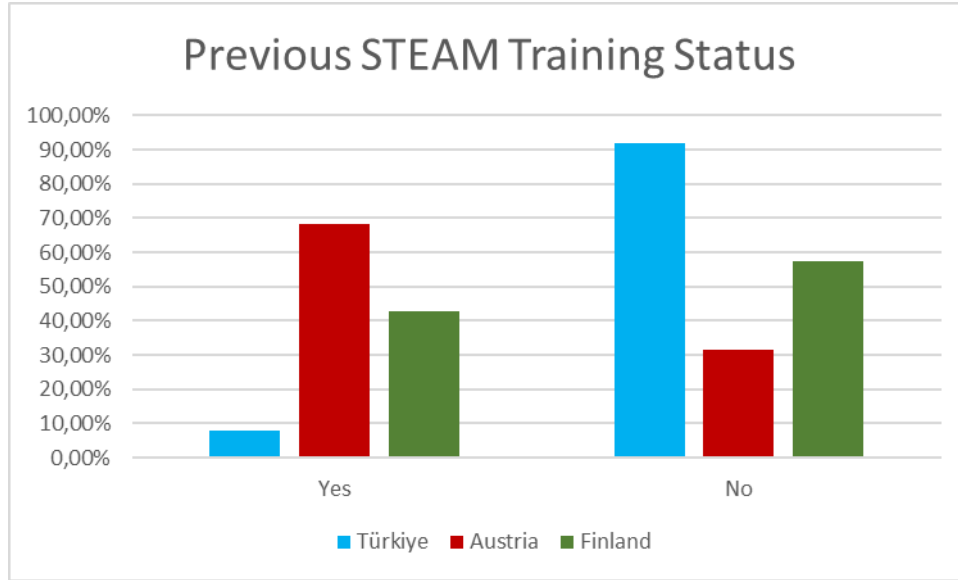
When the level of knowledge of individuals about STEAM education is evaluated in terms of countries, 58.1% of the individuals surveyed from Türkiye have low, 20.8% have medium and 21.1% have high level of knowledge. It was determined that 9,8% of the individuals from Austria had low, 37,7% had medium and 52,5% had high level of knowledge and 36,8% of the individuals from Finland had low, 20,6% had medium and 42,6% had high level of knowledge.



Previous STEAM Training Status

	Türkiye		Austria		Finland	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Yes	96	7.9	41	68.3	29	42.6
No	1119	92.1	19	31.7	39	57.4
Total	1215	100.0	60	100.0	68	100.0

7.9% of the respondents from Türkiye stated that they had received STEAM education before and 92.1% stated that they had not received STEAM education before. Of the individuals from Austria, 68.3% stated that they had received STEAM education before and 31.7% stated that they had not received STEAM education before. 42.6% of the respondents from Finland stated that they had received STEAM education before and 57.4% stated that they had not received STEAM education before.



Hofstede Culture Dimensions Analysis

Masculinity

masculinity	N	Minimum	Maximum	Average	Std . Deviation
Türkiye	1204	1.00	5.00	3.5709	0.79094
Austria	61	1.33	5.00	3.8495	0.68931
Finland	67	1.50	5.00	3.6422	0.76092

When the participants' answers to the masculinity dimension were examined, it was found that the average masculinity score was 3.57 in Türkiye, 3.84 in Austria and 3.64 in Finland. Austria has the highest average masculinity score.

Power Distance

Power Distance	N	Minimum	Maximum	Average	Std . Deviation
Türkiye	1204	1.00	5.00	3.3770	0.82275
Austria	61	1.57	5.00	3.5161	0.50910
Finland	67	1.00	5.00	3.3025	0.74068

When the answers of the participants to the power distance dimension were analyzed, it was found that the average power distance score was 3.37 in Türkiye, 3.51 in Austria and 3.30 in Finland. Austria has the highest average masculinity score.

Long – Short Term Orientation

Long Term	N	Minimum	Maximum	Average	Std . Deviation
Türkiye	1204	1.00	5.00	3.4748	0.75147
Austria	61	1.33	5.00	3.5860	0.58964
Finland	67	1.00	5.00	3.3676	0.80347

When the participants' responses to the long-term orientation dimension were analyzed, it was found that the average power distance score was 3.47 in Türkiye, 3.58 in Austria and 3.36 in Finland. Austria has the highest average masculinity score.

Restraint

Restraint	N	Minimum	Maximum	Average	Std . Deviation
Türkiye	1204	1.00	5.00	3.3200	0.76419
Austria	61	2.50	5.00	3.6913	0.58991
Finland	67	2.00	4.83	3.6776	0.55211

When restraint scores are analyzed, it is found that the average constraint score is 3.32 in Turkey, 3.69 in Austria and 3.68 in Finland. Austria has the highest average constraint score.

Uncertainty Avoidance

Uncertainty	N	Minimum	Maximum	Average	Std . Deviation
Türkiye	1204	1.00	5.00	3.7311	0.76084
Austria	61	2.33	5.00	3.8046	0.54918
Finland	67	2.00	5.00	4.2458	0.49154

When uncertainty avoidance scores are analyzed, it is found that the average uncertainty score is 3.73 in Turkey, 3.80 in Austria and 4.25 in Finland. Finland has the highest average uncertainty score.

Individuality

individuality	N	Minimum	Maximum	Average	Std . Deviation
Türkiye	1204	1.14	5.00	3.4741	0.72360
Austria	61	2.57	5.00	3.7119	0.63594
Finland	67	2.29	5.00	3.9090	0.43906

When individuality scores were analyzed, it was found that the average individuality score was 3.47 in Turkey, 3.71 in Austria and 3.91 in Finland. Finland has the highest average individuality score.

Relationship Analysis

Relationships between various variables and STEAM knowledge level were examined using cross-tabulations.

The Relationship Between Education Level and STEAM Knowledge Level

	What is your knowledge level about STEAM?					Total
	Very low	Low	Middle	High	Very High	
Primary-School	133	47	32	13	10	235
High school	198	116	85	42	24	465
Associate Degree	50	60	58	26	12	206
Bachelor's degree	61	37	71	76	21	266
Master's degree	15	18	37	43	29	142
Doctorate	0	0	6	10	12	28
Total	457	278	289	210	108	1342

Pearson Chi-Square = 302.30; p=0.000

spearman Correlation = 0.402; p=0.000

P: stands for probability.

It was determined that there was a relationship between education level and STEAM knowledge level (Pearson Chi-Square = 302,30; p=0,000). It was determined that there was a positive relationship between

the education level of individuals and their level of knowledge about STEAM (Spearman Correlation= 0,402; p=0,000).

The Relationship Between Countries and STEAM Knowledge Level

	What is your knowledge level about STEAM?					Total
	Very low	Low	Middle	High	Very High	
Türkiye	443	262	254	181	77	1218
Austria	1	5	23	14	18	61
Finland	14	11	14	16	13	68
Total	458	278	291	211	108	1347

Pearson Chi-Square = 93.065; p=0.000
spearman Correlation = 0.215; p=0.000
P: stands for probability.

STEAM knowledge level was found to differ according to countries (Pearson Chi-Square = 302.30; p=0.000).

Research Hypotheses

H₁: There is a relationship between masculinity and STEAM knowledge level.

	What is your knowledge level about STEAM?					Total
	Very low	Low	Middle	High	Very High	
Strongly disagree	15	4	1	1	1	22
Disagree	85	32	14	8	8	147
Undecided	120	83	60	25	6	294
Agree	173	120	163	117	52	625
Strongly agree	59	35	48	59	41	242
Total	452	274	286	210	108	1330

Pearson Chi-Square = 157.449; p=0.000
spearman Correlation = 0.295; p=0.000

It was determined that there is a relationship between masculinity level and STEAM knowledge level (Pearson Chi-Square = 302.30; p=0.000). It was determined that there is a positive relationship between the

masculinity level of individuals and their knowledge levels about STEAM (Spearman Correlation = 0.295; p=0.000).

H₂: There is a relationship between Power Distance and STEAM knowledge level.

	What is your knowledge level about STEAM?					Total
	Very low	Low	Middle	High	Very High	
Strongly disagree	28	4	1	0	0	33
Disagree	113	48	11	5	10	187
Undecided	138	79	56	36	12	321
Agree	153	128	179	109	52	621
Strongly agree	20	15	39	60	34	168
Total	452	274	286	210	108	1330

Pearson Chi-Square = 288.813; p=0.000
spearman Correlation = 0.417; p=0.000

It was determined that there is a relationship between power distance level and STEAM knowledge level (Pearson Chi-Square = 288,813; p=0,000). It was determined that there is a positive relationship between individuals' power distance levels and their level of knowledge about STEAM (Spearman Correlation= 288,813; p=0,000).

H₃: There is a relationship between short-long term orientation and STEAM knowledge level.

	What is your knowledge level about STEAM?					Total
	Very low	Low	Middle	High	Very High	
Strongly disagree	17	10	1	1	0	29
Disagree	91	30	9	4	7	141
Undecided	167	99	63	36	14	379
Agree	147	117	179	108	49	600
Strongly agree	30	18	34	61	38	181
Total	452	274	286	210	108	1330

Pearson Chi-Square = 265.603; p=0.000
spearman Correlation = 0.393; p=0.000

It was determined that there is a relationship between short- and long-term orientation level and STEAM knowledge level (Pearson Chi-Square = 288.813; p=0.000). It was determined that there is a positive

relationship between individuals' short-long term orientation levels and their knowledge levels about STEAM (Spearman Correlation = 0.393; $p=0.000$).

H₄: There is a relationship between restriction and STEAM knowledge level.

	What is your knowledge level about STEAM?					Total
	Very low	Low	Middle	High	Very High	
Strongly disagree	19	5	1	0	2	27
Disagree	133	40	17	12	9	211
Undecided	170	110	78	37	22	417
Agree	108	106	157	114	52	537
Strongly agree	22	13	33	47	23	138
Total	452	274	286	210	108	1330

Pearson Chi-Square = 258,214; $p=0.000$
spearman Correlation = 0.400; $p=0.000$

It was determined that there is a relationship between the level of restriction and the level of STEAM knowledge (Pearson Chi-Square = 258,214; $p=0.000$). It was determined that there is a positive relationship between individuals' restriction levels and their knowledge levels about STEAM (Spearman Correlation = 0.400; $p=0.000$).

H₅: There is a relationship between uncertainty avoidance and STEAM knowledge level.

	What is your knowledge level about STEAM?					Total
	Very low	Low	Middle	High	Very High	
Strongly disagree	8	1	2	0	0	11
Disagree	61	21	4	7	6	99
Undecided	113	61	45	21	13	253
Agree	186	135	154	92	48	615
Strongly agree	84	56	81	90	41	352
Total	452	274	286	210	108	1330

Pearson Chi-Square = 121.674; $p=0.000$
spearman Correlation = 0.263; $p=0.000$

It was determined that there is a relationship between the level of uncertainty avoidance and the level of STEAM knowledge (Pearson Chi-Square = 121.674; $p=0.000$). It has been determined that there is a positive

relationship between individuals' uncertainty levels and their knowledge levels about STEAM (Spearman Correlation = 0.263; p=0.000).

H₆: There is a relationship between individuality and STEAM knowledge level.

	What is your knowledge level about STEAM?					Total
	Very low	Low	Middle	High	Very High	
Strongly disagree	11	3	2	0	0	16
Disagree	98	33	10	8	7	156
Undecided	146	83	58	27	17	331
Agree	167	134	165	111	50	627
Strongly agree	30	21	51	64	34	200
Total	452	274	286	210	108	1330

Pearson Chi-Square = 213,788; p=0.000
spearman Correlation = 0.369; p=0.000

It was determined that there is a relationship between the level of individuality and the level of STEAM knowledge (Pearson Chi-Square = 213,788; p=0.000). It was determined that there is a positive relationship between individuals' levels of individuality and their level of knowledge about STEAM (Spearman Correlation = 0.369; p=0.000).

Correlation Analysis

STEAM Knowledge Level	Türkiye	Austria	Finland
	Correlation Coefficient	Correlation Coefficient	Correlation Coefficient
masculinity	0.300**	0.450**	0.314**
Power Distance	0.442**	0.461**	0.301**
Long Term Orientation	0.406**	0.444**	0.268**
Restraint	0.402**	0.261**	0.535**
Uncertainty Avoidance	0.301**	0.294**	-0.80
Collectivism	0.405**	0.458**	0.398**

** indicates statistical significance at the 1% significance level.

It is concluded that there is a significant and positive relationship between STEAM knowledge levels and Hofstede's cultural dimensions. For Turkey and Austria, there is a significant relationship between all Hofstede's sub-dimensions and STEAM knowledge level. However, for Finland, no significant relationship was found between uncertainty avoidance and STEAM knowledge level, while a significant and positive relationship was found between other sub-dimensions and STEAM knowledge level.

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