



## Research Article

# The integration of 21<sup>st</sup> century skills into education: an evaluation based on an activity example

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### Abstract

Changes have been made in education systems within the changing and developing structure of our age. In this context, while achieving 21st century skills is among the most important achievements, determining the activities to be prepared for students to acquire 21st century skills and arranging the classroom environments according to these activities impose new and important tasks on teachers. In this study, evaluations based on a performed activity are presented in the context of the integration of 21st Century Skills into Turkish National Education system. The “Where are we?” activity which is presented in detail in the study is an interdisciplinary activity carried out in Mamak Science and Arts Centre with 4th graders. The activity is described in three steps, namely preparation, implementation and evaluation, and its significance in providing students with 4C (Creativity, Communication, Critical Thinking and Collaboration) skills, which are regarded as the foundation of 21st Century Skills, is underlined. The activity is also evaluated in terms of applicability and popularization, and special emphasis is put on the importance of class environment in gaining 21st Century Skills. Within this framework, it is recommended to enhance teacher trainings and activity samples in quantity and quality for the acquisition of 21st Century Skills in students and also suggestions were made to policy makers for the process of integrating 21st century skills into the education system. The study has a unique structure as it is exemplified through an activity example. It is thought to be a resource for all academicians, teachers and policy makers interested in the subject.

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## Introduction

In the 21<sup>st</sup> century in which we live, it is a well-known fact that in the adaptation of individuals in every stage of education to this era, which is improving rapidly, the most significant share belongs to education. At this point, it is of great importance to map out what needs to be done in education and also to make a list of learning and planning skills that are aimed to acquire in the 21<sup>st</sup> century (Özçelik, 2019).

When it is considered that students in preschools or even primary schools in our era will practice various new professions that do not exist at present after they graduate, it is not difficult to imagine how hard it must be for children, who are the future of countries, to prepare for an unknown future. It is thought, therefore, that students who acquire the skills of their era will rapidly adapt to change and progress and easily work in any line of business thanks to that (Ömeroğlu, 2019).

Many qualities such as innovativeness and critical thinking/problem solving are named as 21<sup>st</sup> Century Skills which have become necessities for the individual's ability to actively use the rapidly changing technological tools of the 21<sup>st</sup> century, to adapt to these technological environments, and additionally to reach the final step (self-realization) of

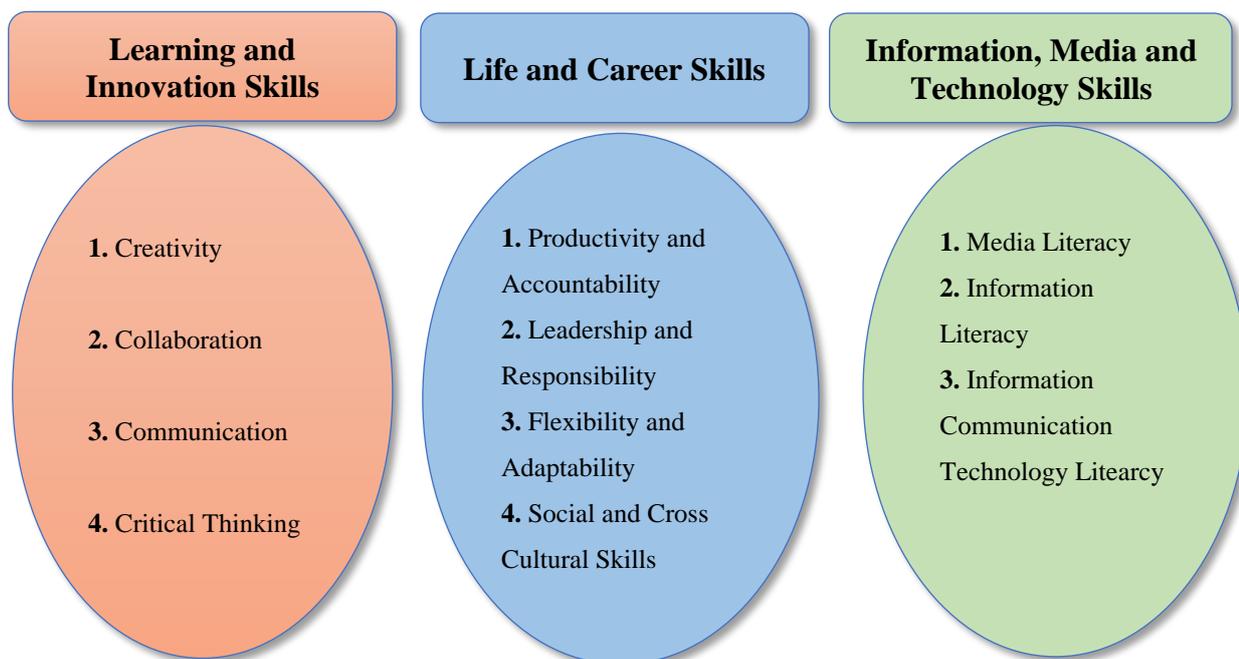
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Bloom’s taxonomy of individual progress. While part of these skills has been used by individuals for long, another part of them is considered necessary to gain via developing technology. Among these skills are information literacy and technology literacy. For individuals to express themselves freely and reach a stage where they can learn by themselves by doing the required research (meta-learning) have become some of the most essential aims of this era. Such that, many valuable people in the past who reached this stage are known by all to have experienced problems in their educational environment. For instance, industrial societies which came into being as a result of the Industrial Revolution were effective in the 20<sup>th</sup> century. In these societies, the mentality of “society instead of individual” was dominant. Decisions made by societies meant more than individual thoughts. It is found out that as a result of this individuals with different thoughts experienced serious problems in that century. It is well-known that great scientists who left their mark in history like Albert Einstein and Thomas Edison experienced problems in their educational background and had to leave school (Turkey Intelligence Foundation [TGV], 2017).

When the information age arrived, it became possible to search for, question, interpret and criticize information. As a consequence of these possibilities, skills such as creativity and critical thinking stood out before many other skills. Education lays the basis for finding solutions for issues arising from economic, technological, environmental and societal changes and fighting against these issues. Education, naturally, needs to be revised and improved according to this changing system. It is realized that nowadays, the most essential skills for individuals to have in order to improve and revise education systems are “21<sup>st</sup> Century Skills”. Numerous researches have been carried out about the content and structure of “21<sup>st</sup> Century Skills”, and ideas about these skills are put forth (Yılmaz, 2016).

One of these researches was prepared by Ekici et al. in (2017). In that study, 19 different sources related to the subject were examined, and 63 skills are designated in total by analysing the skills in those sources. It is detected that the most highlighted skills among those were critical thinking, creativity, communication, collaboration, problem solving, information/technology/media literacy, decision-making, leadership, flexibility and adaptability, initiative, responsibility and productivity. Another source that studies the mentioned skills within the scope of “21<sup>st</sup> Century Skills” is a United States of America-based organization, “Partnership for 21st Century Skills (P21)” (P21, 2015). The mentioned organization describes the support systems prepared for the acquisition of content, theme and skills that are necessary for the present information age in three main categories. These three categories are “Learning and Innovation Skills”, “Information, Media and Technology Skills” and “Life and Career Skills”, as presented in Figure 1 below (P21, 2015).



**Figure 1.**  
Categorization of 21<sup>st</sup> Century Skills (P 21, 2015)

As is shown in Figure 1, Creativity, Critical Thinking, Communication and Collaboration skills, which are also named as “4C Skills” due to the fact that all these words start with a “C” in English, are acknowledged as skills which

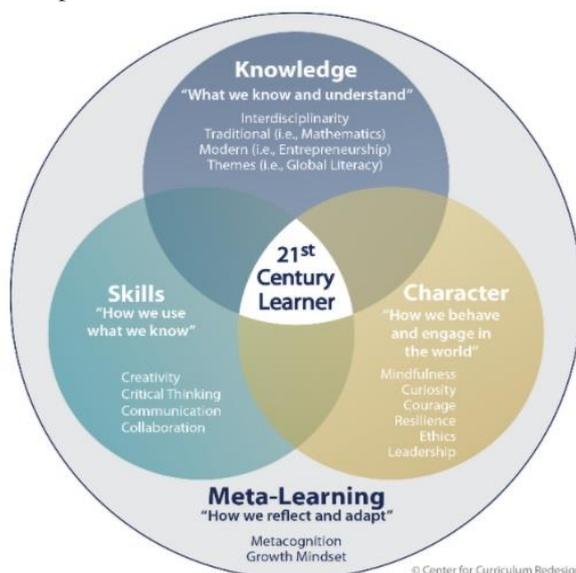
individuals should certainly have to be able to adjust to the complicated order of the present era. Synthesizing the searched-for and obtained information accurately, ethically and according to its enlightening aspects will be possible via the enhancement of critical thinking skills. Via the enhancement of creativity skills, it will be possible to interpret the results obtained through this synthesis of information and transform them into a new product. Communication and collaboration skills point to the skills of collaboration about a situation/problem, self-expression and adaptability (P21, 2015).

Another category shown in Figure 1 is “Life and Career Skills”. Skills in this category are defined as enabling individuals to live together in peace, think of differences as “benefits”, not “problems”, stand up in the face of competitive system and structures which are existent in many areas of life worldwide, and have the power to adapt to different cultures, languages and living environments. Thanks to these skills, individuals have the power to discover themselves; they can create better environments for themselves in terms of both living and working conditions. Individuals, who discover and improve themselves while creating these environments, benefit from the society they live in. Life and career skills are skills which enable them to adapt to the environments they are/will be living in in a short time, develop their survival and resistance mechanisms against any kind of hardship they may encounter, achieve efficient outcomes through projects they design, show love and respect towards every individual in their society, and gain awareness about important global issues by knowing the rights and responsibilities of each individual. Individuals with these skills contribute to the formation of societies with professional work discipline and awareness about their responsibilities. The perspective “society for individuals” underlies these skills (P21, 2015).

In the present era, it is evident that individuals have an environment enriched by media and technology. The multitude of ways to access information accurately and fast, the existence of technology which is changing swiftly to the utmost degree and tools dependent on it made it obligatory for individuals to use media, technology and information efficiently, and analyse, synthesize and evaluate this information in the most efficient, accurate manner if they are to be 21<sup>st</sup> century citizens. Hence, both media and information literacy are indispensable 21<sup>st</sup> Century Skills (P21, 2015).

### 21<sup>st</sup> Century Skills in an Educational Environment

Based on what is mentioned above, it is clear that in this era it is a requirement for not only individuals but also schools to carry out preparations and studies about 21<sup>st</sup> Century Skills. Trainings in schools are dependent on a curriculum. Today, changes that need to be made in educational environments should be based on this curriculum which includes trainings in schools. The mentioned curricula are based on four main dimensions. These are knowledge, skills, character, and meta-learning (Fadel et al. 2015). These four dimensions should operate in an intertwined manner in educational environments (Figure 2). Skills should be provided along with information offered in every course. Moreover, character improvement of students is of utmost importance in this curriculum system, as well. It is envisioned that students can access meta-learning methods and discover and realize themselves by learning on their own granted that these dimensions are paid due attention.



**Figure 2.**  
Dimensions of the 21<sup>st</sup> Century Education

(Web 1: <https://www.utschools.ca/blog/content/four-dimensions-education-21st-century-teaching-learning> )

In this era, which is swiftly developing and changing, societies have started to arrange their education systems according to this change. For example, countries such as New Zealand, Italy, Norway, Finland, Belgium, Ireland, Australia and Canada are integrating 21<sup>st</sup> Century Skills into their education systems. In Turkey, skills like communication, critical thinking, creative thinking, problem solving, initiative, using IT, decision-making are among the common skills that are projected to provide the students with in primary and secondary school curricula which have been in practice since 2004 (OECD, 2009: 24-26).

In terms of providing the students with 21<sup>st</sup> Century Skills, educational environments play a role as essential as education programs. The educational environments of industrial societies, which are also described as the traditional classroom order, were rote-learning environments where the teacher was active whereas the students were merely listeners and had limited space to move. Yet in the 21<sup>st</sup> century, it is clear that students learning in these educational environments cannot be successful. Therefore, important changes need to take place in educational environments. These environments need to be revised for all the courses and activities to be designed especially for the provision of the mentioned 21<sup>st</sup> Century Skills. When the designed activities are performed in classroom environments where students can easily express themselves and actively take part in an activity, it will be easier for students to reach the targeted outcomes. To this end, the importance of educative games, stations and workshops is multiplying day by day. It is also required that the necessary technological infrastructure is implemented in educational environments so that the student can access information quickly and safely in the technology era. In these targeted classrooms environments, there should be all kinds of mobile devices and books to support the necessary research required for the meta-learning of students. At this point, teachers in the classroom should support the students as their guide so as to enable them to use the available equipment and materials in a right and effective fashion. This is only possible when teachers get trainings before educating and prepare themselves. There is an endeavour growing stronger day by day to create such educational environments all over the world and educate students in those environments (Kırtak Ad, 2017). Workshops, laboratories, enriched libraries and active learning classrooms can exemplify these learning environments (Çolak, 2018).

In this context, when both trainings and learning environments are taken into consideration, it is obvious that to provide today's students with 21<sup>st</sup> Century Skills teachers need enough knowledge background, whereas teaching environments need tools and technological infrastructure. This situation is the basic problem probed in this study. Science and Arts Centres (BILSEMs) are perhaps one of the most significant of those educational environments. Science and Arts Centres are special education institutions founded by the Ministry of National Education Directorate General for Special Education and Guidance Services with the aim of enabling gifted primary and secondary school students, without hindering the education they get in mainstream institutions, to discover their personal talents and improve those talents in order to come up with efficient products (Science and Arts Centres Directive, 2019). There are important activities to improve the talents of gifted children via the carried out differentiation trainings in these centres. Extracurricular activities designed for the talent qualification and development of gifted individuals are also programmed in a way to create opportunities for the individual in terms of developing skills among which there are 21<sup>st</sup> century skills like creativity, critical thinking, communication and collaboration. As such, while observing and working towards students' special talent domains, it is aimed at the same time to prepare the ground for behavioural changes based on character and skill development.

Moving from here, this study aims to share an activity prepared for gifted students educated in Science and Arts Centres in the light of 21<sup>st</sup> Century Skills with the steps of goal, achievement, implementation and evaluation. The study is significant in that it provides an example for these processes of 21<sup>st</sup> Century Skills which are aimed to provide all the students in educational environments of our era with, and it is unique since no such study was carried out before.

Taking all the things mentioned above into account, the aim of this study is to support teachers, who are "instructors" and "guides" in providing the students of our era with 21<sup>st</sup> Century Skills, to improve themselves.

### **The Activity That Is the Problem of This Study**

The study is prepared on the basis of this question: "How should we design an activity towards providing the students with 21<sup>st</sup> Century Skills?" This question is at the same time the problem of the study.

In the study prepared for this end, the example of an activity intending that the students gain 21<sup>st</sup> Century Skills is shared. The activity is explained in detail in three main steps, namely preparation, implementation and evaluation, and is aimed at setting an example for activities to be conducted by teachers in their own teaching environments. The activity is performed by the primary school 4<sup>th</sup> graders in Mamak Science and Arts Centre which gives education to gifted students. The pictures of the students in the activity that is shared in the study are disguised according to the right of “Secrecy and Protection of Private Life”.

### **Implementation**

Before sharing the example activity in this study, it is necessary to focus on the mentioned question of “How should we design an activity towards providing the students with 21<sup>st</sup> Century Skills?” It will prove productive that every activity prepared to provide the students with the skills which are mentioned in this study as 21<sup>st</sup> Century Skills is interdisciplinary and addresses more than one achievement. The activity should be prepared including preparation, implementation and evaluation stages, and the requirements of every stage should be determined. At this point, the classroom environment where the activity is to take place should be arranged accordingly to each stage. The implementation of the activity, which is designed according to all these points mentioned above, is shared below.

#### **The Content of the “Where are we?” Activity**

The activity is designed to be implemented with 4<sup>th</sup> graders. During the implementation of the activity, Social Studies, Geography and Visual Arts teachers and other teachers who are willing to make an observation are present in the classroom both as leaders and observers. The activity aims at the student achieving these:

- ✓ Develops communication skills
- ✓ Develops problem-solving skills
- ✓ Plays an active role in a group activity in collaboration
- ✓ Completes the assigned task as best as he/she can using his/her creativity and imagination
- ✓ Learns where continents are located on the Earth in detail
- ✓ Learns where Turkey is located on the Earth
- ✓ Can redraw with a group, a picture/photograph/map that he/she saw for a short time
- ✓ Can actively present the prepared product as a member of the group

#### **Preparation Stage**

All preparations need to be completed before the activity. Hence, while the Social Studies and Geography teachers are in charge of preparing the maps and the Visual Arts teacher(s) the necessary equipment for colouring, Form teachers and other teachers who are going to observe students are in charge of arranging the sitting order of students in the classroom.

#### **Implementation Stage**

In the beginning of the activity, students are asked questions about the Earth, continents, where Turkey is located on the Earth, and other questions of a similar kind as preliminary preparation. Afterwards, students are divided into groups of eight and take their place at one corner of the classroom allocated for them. Each group is given a drawing paper in size 70x100 and a 12-piece crayon set. After this step, students are told what they are expected to do as in the directives:

- a) All the students are shown the world map for two minutes. (Figure 3)



**Figure 3.**

*Students are Examining the World Map*

- b) At the end of these two minutes, all groups are asked to draw a world map on the drawing paper in front of them.
- c) In the group which consists of eight students, seven students draw the seven continents whereas the eighth student is expected to locate and draw Turkey on the map. (Figure 4)



**Figure 4.**

*Distribution of Roles which is Conducted by Students in Communication and Collaboration with Each Other*

- d) It is announced that all groups have 25 minutes to complete the task.

After the students are given the necessary directives, it will be decided in a communicative and collaborative group atmosphere who will draw each continent and who will locate Turkey. (Figure 5)



**Figure 5.**  
*Students are Preparing the Project after They have Distributed the Tasks*

Students who benefit from their imagination and creativity after seeing the map for a very short time are expected to use the drawing paper proportionately and complete their project in the assigned duration. (Figure 6)



**Figure 6.**  
*A Group of Students who are about to Finish Their Tasks at the Assigned Time*

#### **Evaluation Stage**

At the end of the duration, all groups go to the dais in the classroom and share their product with both their other friends and teachers. Afterwards, both the teachers and the students who have listened to the presentations are expected to give feedbacks and evaluate the projects constructively. At this stage, the communication and critical thinking skills of the students are observed, as well. Towards the end of the activity, all the products are hung on the place where they are to be displayed, and the activity comes to an end. After this, teachers share their observations about the skills which are targeted for students. Many skills such as knowledge of location, communication skills, teamwork techniques, collaboration, creativity and critical thinking are discussed on the basis of each student and a

report is formed. Thus, the students' progress is monitored according to the observations related to both space and 21<sup>st</sup> Century Skills.

### Discussion and Conclusion

From the beginning of the 21<sup>st</sup> century up until today, there have been on both global and national scales many critical advances in the educational field. Actually, these are changes that have occurred in parallel with the revolutionary progress of technology from the middle of the 20<sup>th</sup> century onward. In terms of keeping up with these changes, policymakers in so-called developed countries are known to strive to develop policies by centralizing 21<sup>st</sup> Century Skills to prepare people for a life that is skill-, talent- and competence-oriented. In this context, there has been an important progress on a global scale (Hamarat, 2019).

The most important ones of these policies are the ones which are/will be created in the educational field. Within this framework, it is clear how essential education policies and activities to be programmed in schools in this field are. It is crucial in the educational planning in this field for teachers to be knowledgeable about 21<sup>st</sup> Century Skills which are targeted for students and get the fundamental trainings regarding the development of these skills in students. Furthermore, activity environments are apparently in need of arrangements with respect to developing the abovementioned skills in students (Cansoy, 2018).

When the categorization of the P21 organization, which plays an active role in the forming of 21<sup>st</sup> Century Skills, is examined, it is seen that the skills are placed under four main titles, and the learning environment is the basis of these categories. As such, it is visible that the learning environment plays an extremely important role in the provision of these skills for students (Hamarat, 2019).

There is a study in the literature that examines the schools which have successfully conveyed 21<sup>st</sup> Century Skills to students. According to this study, in these successful schools, it is detected that the leadership is shared between students, the society supports education in every level, success becomes a natural outcome thanks to this, and additionally, research carried out in these schools are based more on scientific ground (P21, 2018a, 2-9).

In addition to this, in another study that examines the schools which have successfully conveyed 21<sup>st</sup> Century Skills to students, it is noticed that there are particular practises that are implemented in these schools quite often. According to this study, in these schools, collaboration, creativity, critical thinking and communication skills are considerably integrated into the curriculum, technological infrastructure is set with the programmed trainings in mind, activities are prepared as project-based and product-oriented, programmes are arranged in a fashion that is compatible with the structure of meta-learning, the prepared activities are designed as suitable for the qualification and assessment of the students' skills, and the society-school integration is completed (Brown, 2018).

Moving from all of what is mentioned above, the aim of explaining in detail an interdisciplinary activity which has the goal of providing the skills of the present 21<sup>st</sup> century is to contribute to the education programming in this field. The information, directives, number of targeted students and similar elements given in the activity example can vary according to the classroom environment, number of present students and available teachers, and sufficiency of necessary equipment and material. Thus, the activity is applicable in different disciplines, class, visual arts and social studies being in the first place, for all classes in the level of primary or secondary schools via changes. Furthermore, it is valuable in terms of the applicability that the activity requires for easily accessible and inexpensive equipment and materials.

The number of such activities as the one described in this study increasing, similar activities getting implemented by teachers and getting somewhat popularized will be an important step towards the acquisition of 21<sup>st</sup> Century Skills which are targeted for students. Here, it is of utmost importance that teachers are ensured to build an awareness about 21<sup>st</sup> Century Skills and aim at providing students with these skills in the light of the information they obtain through partaking in trainer trainings.

It is a promising development that, within the scope of Industry 4.0, which is reached thanks to developing industry and technologies, and Education 4.0 which runs parallel with this, the Ministry of National Education has started to plan, and in fact take actions to build 21<sup>st</sup> Century Skills within its curriculum.

That there are a section and targets directly related to the subject in the 2023 Vision Document of the Ministry of National Education denotes that Turkey will concentrate on skills development while determining an education policy towards the future (Hamarat, 2019).

With respect to building these skills, apparently, it should not be enough to only strive at the curriculum level, and educational environments should be at an applicable, modern level in parallel with that. As a result of both increasing

the activities similar to the one that is presented in the study in quantity and quality and preparing the environments where these activities are to take place in a manner that is in accordance with the 21<sup>st</sup> century, Education 4.0 will be feasible in full measure, and children of the 21<sup>st</sup> century will adjust themselves to the rapid changes of the modern era thanks to being equipped with these skills.

### Recommendations

It is mentioned above how important it is to equip children, who are the future of countries, with 21<sup>st</sup> Century Skills and mould education policies in this framework. Based on this, there are various recommendations below for both policymakers and teachers.

#### Recommendations for policymakers

- In this context, just like many successful countries did, the Ministry of National Education has endeavoured to first determine the qualifications of students and teachers to be able to determine the qualifications that a “21<sup>st</sup> century person” should have. This practice may be repeated in workshops with the participation of all the institutions, organizations and shareholders forming the education community.
- Scrutinizing skill-oriented practices throughout the world and conducting comprehensive case studies in our country may contribute to the preparation of skill-developing education programmes that are unique to Turkey by policymakers in the education area in Turkey.
- It is underlined in the study how essential a place educational environment occupy in skill development. Concordantly, learning environments in school, out of school and even in virtual platforms should be arranged in order to be in accordance with the activity. Most operative technologies of recent times like augmented reality, simulation and mobile applications can also be named among these learning environments.
- For the development of 21<sup>st</sup> Century Skills, learning environments must absolutely be arranged in an activity-based fashion. Teachers play the most important role here. While the teachers are involved with the necessary arrangements, the rest of the staff in school should support them if need be.
- Rapidly changing technology of the 21<sup>st</sup> century must absolutely be integrated into learning environments. It is beneficial to regard this point in all the policies to be prepared.

#### Recommendations for teachers

- Teachers are the leading actors in developing 21<sup>st</sup> Century Skills in the students in the classroom. Hence, teachers must absolutely be trained on the topic of 21<sup>st</sup> Century Skills. Moreover, it will be highly beneficial in the long run for teachers-to-be to take, as compulsives or electives, 21<sup>st</sup> Century Skills related courses among others in their higher education institution.
- Teachers may need support regarding providing the students with a skill-based education according to the education programmes which are/will be newly prepared. At this point, it will be of service that other teachers who got trainings related to the subject share their knowledge with them, and that they are given subject-related trainings and support via distant training in virtual platforms like EBA and such.

### Acknowledgement

In effect, this study started to maturate and take form thanks to the teacher trainings that authors of this study, who are teachers in Mamak Science and Arts Centre, got, titled “I Am Learning/Teaching in the Light of 21<sup>st</sup> Century Skills” which were funded by Turkish National Agency in 2019 within the scope of Erasmus+ K101 Staff Mobility Project. The authors have better understood the significance of 21<sup>st</sup> Century Skills for societies thanks to their participation in the trainer training titled “4C Skills” in Florence, Italy, which awarded them the international trainer certificate. In that process, the authors came to notice that the “Where are we?” activity which they had been conducting in the institution they worked at may actually be an important source in terms of developing 21<sup>st</sup> Century Skills in students, and then was formed the thought of conducting an academic study about the integration of 21<sup>st</sup> Century Skills into education in Turkey through the mentioned activity, adding the training experiences of the authors to it. That the two authors were working at the same institution while preparing the study, and together they have conducted many studies and projects have affected the writing process of the paper positively. Thus, we would like to give our thanks to all the teachers who gave their support for the “Where are we?” activity, Dr. Sheila CORWIN, who trained the trainers in “4C Skills” in Florence, and Assoc. Prof. Hasan Said TORTOP, who is the editor of the study.

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