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The Effect of the QR Code Game on Motivation in Suzuki Violin Lessons

Research Article

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ABSTRACT

The aim of this study is to investigate the effect of QR code game in Suzuki violin lessons on student motivation. The design of the research is a qualitative case study. Suzuki violin first level pieces were examined with cognitive task analysis method and important technical tasks were revealed. The QR code game consists of two parts: White cards designed to predict pieces from technical tips. Yellow-fun cards are designed to increase the repetition of the tracks and to provide greater motivation. These technical tasks and fun activities were loaded in the QR codes. The QR code game was applied to Suzuki students who took courses together for 15 weeks. The data were collected through student attitude form, student interviews, field observations and expert interviews. Data analysis was done by qualitative content analysis. The results of the analysis were gathered under three titles as spontaneity, willingness and desire for development. At the end of the application, students demanded to play the QR Code game without teacher inducement, preferred the game to other activities they liked, and volunteered to generate ideas for the development of the game. As a result, it was observed that the QR code game increased student motivation.

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Keywords:
Motivation, Mobile Learning, QR Code, Violin, Suzuki Method.

Introduction

In the history of education, technological tools and devices have been thought of a new opportunity for learning and teaching. Today, IT and mobile technologies increase the speed of communication and information sharing; QR code technology has been developed to find our way in this massive ocean of information, to facilitate access and to classify information. This technology has started to be used in education in a short time and the opportunities it offers in both formal and informal learning spaces have started to be studied. The past decade has seen the rapid development of QR applications in many sub-areas of Education. Law and So (2010) presented a review on the use of QR codes in education. The researchers introduced a number of examples that covered a wide variety of educational applications, integrating QR codes and mobile

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devices into subjects ranging from life science to math, English listening exercises, and even accessing library catalogues (Chin, Lee & Chen, 2015, p.373). However, among these studies, far too little attention has been paid to music education. Chen (2015), Paule-Ruiz, Álvarez-García, Pérez- Pérez et al. (2016), Palazon and Giraldes (2018) discuss the applications and strategies of the QR codes in music education. Although some research has been carried out on QR codes in general music education, no studies have been found which related violin education and motivation. The aim of this study to bridge this gap in literature was to examine the effect of QR code game on students' motivation. In order to understand the general framework and importance of the research, the literature on the keywords of motivation, mobile learning, QR codes and Suzuki Violin Method are presented in the following section.

Literature Review

Motivation

Motivation is the essential element and driving force of successful learning. Reeve (2005) defines motivation as "processes that give behavior its energy and direction" (p.8). Prensky (2003) stated that motivation seems to be a key asset in getting children actively involved in the learning process. In the literature, motivation theories indicate that there are two types of motivation. Extrinsic motivation is considered to be coerced by the environment and is derived from an external source such as money, grades, or the approval of others. Intrinsic motivation, on the other hand, does not come from an external source but is inherent in the activity being performed; the activity is considered good or pleasurable in and of itself (Deckers, 2010). There are many theories in the literature that try to explain the motivation on the basis of different disciplines such as biology, sociology, etc. In this study, the ARCS model created by Keller (1987) and developed by Karoulis and Demetriadis (2005) and containing measurable features were used. The ARCS model examines motivation under four main dimensions.

(1) Attention: Attention and motivation cannot be separated from each other. Keller's strategies for attention include sensory stimuli, inquiry arousal (thought provoking questions), and variability (variance in exercises and use of media). There are two observable subdimensions of attention: curiosity and interest. Through the use of different media, the curiosity and interest of learners can be increased.

(2) Relevance: This dimension refers the benefit of the training. Attention and motivation will not be maintained, unless the learner believes the training is relevant. Perception of accomplishing personal needs and relation to a highly desired goal are the subdimensions of relevance. Motivation can be raised by explaining the content and benefits of education to the student.

(3) Confidence: The confidence aspect of the ARCS model is required so that students feel that they should put a good faith and effort into the program. If they think they are incapable of achieving the objectives or that it will take too much time or effort, their motivation will decrease. Expectancy of final success and success under control are the sub-dimensions of confidence.

(4) Satisfaction: This dimension indicates the satisfaction or reward gained by the learner during the learning process. This can be extrinsic or intrinsic, in the form of entertainment or a sense of achievement.

Mobile Learning and Motivation

QR technology was used as a mobile learning tool in this research. Harris (2001) defined mobile learning as the intersection of mobile informatics and electronic learning the aim of which is to produce learning everywhere at all times. Trifonova (2003) described it as any kind of learning and teaching activity achieved with the help of mobile devices or mobile environments. The popularity and wide use of portable devices across all ages and population groups (Johnson, Adams Becker, Cummins et al. 2013) make them an ideal tool to motivate and engage learners from all ages (Bradley & Holley, 2011). Preliminary research suggests that

mobile devices can create more active learning experiences, which improve student engagement; learning and course retention (Joosten, 2010) and the use of new technologies can amplify motivation, encourage students to solve problems and satisfy their curiosity (Sharples, Corlett, & Westmancott, 2002).

It has become critical to develop effective and easy-to-follow learning guidance models for a context-aware mobile learning system. Ciampa (2014) proposed a mobile learning model to help understand the motivating features of using mobile devices for learning, and to learn how mobile technologies could be used to enhance learners' motivation. Huizenga, Admiraal, Akkerman et al. (2009) developed a mobile game-based learning activity for secondary education, which combined situational and active learning with fun, and had enormous potential for enhancing student engagement, motivation and learning.

As in other fields of education, mobile learning started to take its place in music education as well. Leong (2011) suggested that interactive applications and activities must be developed for such a prosperous experience, where students can lead the process individually; such as listening to different pieces, improving listening skills, and recording the performance at home. In addition to sound and video recording programs, which come as default in mobile devices, music teachers also utilize industrial and social networking applications such as Soundcloud, Youtube, and Spotify in their classes for micro-teaching, performance improvement, and evaluation purposes. Apart from these general applications, there are also special softwares designed exclusively for music education.

It has been shown by various studies that mobile learning has a positive effect on the motivation of music students. Chen (2015) and Paule-Ruiz, Álvarez-García, Pérez- Pérez et al. (2016) stated that the mobile applications are tools that increase student motivation as well as their success in aural training at both preschool and primary level. Magalhaes, Monteiro, Carvalho et al. (2018) concluded that Ritornello application enhanced students' interest, participation and learning motivation in music and art courses.

Educational Games in Mobile Learning

Especially in the education of children, game is a very important source of motivation. Babies discover life with a wide variety of games from birth. According to Van Vleet and Feeney (2015), play can be regarded as a behavior engaged in with the purpose of amusement, enjoyment, and fun that is approached with enthusiasm and being in the moment, which results in a liberating and enjoyable experience. Play behavior is highly interactive with others, with an activity, or both.

Throughout the history of education, different types of educational games have been developed for all levels and subjects. With the opportunities offered by the technology, games have started to be developed rapidly within the scope of mobile learning. The ability of mobile devices to connect to the Internet and to each other, instant photo-video sharing and voice recording features provide a rich infrastructure for games in learning environments. In a meta-analysis of articles published between 2007 and 2016 on mobile games, Chang and Hwang (2019) found that the most researched type of educational games were role-play games, followed by simulation, gamification, puzzle games, hybrid genre, board games and tutorial games, respectively. Creativity, goal-setting, and team interaction are the important motivators of students who are engaged in an educational role-play (Burenkova, Arkhipova, Semenov et al. 2015). In another study using mobile role-playing, Huizenga, Admiraal, Akkerman et al. (2009) stated that students showed highly-motivated performance during the medieval mobile city game. In the digital game-based learning contexts it is observed that it is easier for students to understand the crucial concepts of the subjects.

In Chang and Hwnag (2019) 's analysis, another important issue is the application of mobile games. Most researches have been conducted in the fields of social sciences, science, engineering, language and healthcare nursing. However, the number of researches in the fields of art or design, mathematics and business management between 2007 and 2016 is negligible. This study is also important in terms of mobile learning and

games in the field of art and music education. In this study, QR code technology was chosen as a game interface in Suzuki Violin lessons due to being user-friendly, providing rich learning tools by being directed to all kinds of audiovisual materials, compatibility with all mobile devices and operating systems, and requiring no advanced computer or coding skills.

QR Codes

QR codes are an extension of standard barcodes. Its main function is to provide a shortcut between the related product and the system connection. This shortcut can direct the user to a website, a default text, a picture, a map, a video etc. In addition to business and production sectors, QR codes have extensive use in museums, libraries, ID cards, posters and banners. QR code's educational use is also gradually increasing. Çataloğlu and Ateşkan (2014) mentioned that QR codes can be used online and offline. Robertson and Green (2012) state that QR codes will be included in the published material and reduce the distance between books and the Internet; they will help students to access to their own studies and blog pages; ensure them to reach more comprehensive information depending on their needs; and that they will be used in activities where students can develop their own codes. Studies also confirm these foresights and indicate that when online learning sources are used together with the published ones (e.g. books, written class notes), they enhance the interest and motivation of the student towards the subject and increase the learning success (Chen, Chang, Wang et al. 2008; Kukulska-Hulme & Traxler, 2005; Liaw, Hatala, & Huang, 2010). Ramsden (2008) also presented that QR Codes can be integrated to virtual reality games and used to provide feedbacks in face-to-face education. Besides, studies such as learning history through QR codes (Chen & Choi, 2010), processing of the periodic table where each chemical element is explained with a QR code (Bonifacio, 2012), geocaching with QR codes (Sharma, 2013), and QR code-aided foreign language education (Liu, Tan & Chu, 2010) are only some of the researches proving the benefits of QR codes in different fields. QR codes are today the most popular AR technology in educational setups where they support open, innovative, active and inquiry-based scenarios (De Pietro & Frontera, 2012; Rouillard, 2008) with positive influence both on motivation and learning, for grades down to Kindergarten (Law & So, 2010).

QR Codes in Music Education

As in other fields of education, QR codes enable the creation of interesting activities in music and instrumental courses, too. Wardrobe (2013) stated that QR codes will enable the preparation of QR-coded worksheets providing shortcuts to the videos, performances, web sites, or residential maps of artists the students admire. Miracle (2015) suggested that QR code technology can be used for the purposes of listening, watching, checking the answer, visiting a web page, and preparing a class bulletin. Kelleher (2015), on the other hand, specified that QR codes can be used to provide a wider range of interactive sources for students in order to encourage them to listen more and learn independently. He stated that he prepared QR codes directing to YouTube videos in an attempt to complete the students' inadequate information about orchestra, and that he hanged these codes on office doors, classroom walls, and corridors. He observed that students enjoyed scanning these codes and compensated their missing information on orchestra in a short time.

QR codes have been used for a long time in the industry; however, QR research is still brand new in music education. Although user experiences about the use of QR codes in music education are available on the Internet and various blogs, there is limited information based on published research studies. Palazon and Giraldes (2018) used the flipped learning model and proved that using QR-coded videos to play instrument has established a suitable system and provided immediate responses to students during indoor and outdoor class activities. Although Chen, Teng, Lee et al. (2011) stated that QR codes do not improve designated skills such as reading, Palazon and Giraldes (2018) showed that it is possible to manage such an improvement by using musical videos together with QR codes. Finally, Preka and Rangoussi (2019) adapted the 'treasure

hunting' game to music education by using QR codes with preschool students. Evaluation results indicate that the AR-QR technology is a powerful tool that triggers and sustains children's interest and is capable of enhancing their cognitive skills, collaborative skills and social interaction. The most important outcome of that study has been the hearty and enthusiastic participation of all kids and their full motivation and interest in the game; as well as in the technology used.

Suzuki Method

Music education is acknowledged today as instrumental to the development of cognitive, language, motor, emotional and social skills in children. Especially, 20th-century approaches, including Suzuki's holistic approach to children's development, have changed the way of thinking in music education. Shinichi Suzuki (1898-1998) is a Japanese violin teacher and founder of the internationally acclaimed Talent Education, which is also known as Mother Tongue Method approach. Suzuki noticed babies learned their native language, or their "mother tongue," with ease when they were young, and hypothesized that the environment was the main contributor to language acquisition (Kendall, 1966) and then he adapted it into instrumental education.

Suzuki built his approach on a variety of fundamental principles. Among these principles 'every child can learn', 'encouragement', 'parent involvement', 'environment and listening' and 'group lessons' which are directly related with motivation (Bossuat, 2015).

Every child can learn: Just as children are able to acquire the language(s) spoken around them by their parents and caregivers, Suzuki believed that everyone was capable of developing high levels of ability in any area of learning, provided that they were given the right conditions: 'Every child can be educated; it is only a matter of the method of education. Anyone can train himself [or herself]; it is only a question of using the right kind of effort' (Suzuki, 2010).

Encouragement: Similar to learning a language, a child's effort to learn how to use an instrument should be met with sincere praise and encouragement. Each child learns at his/her own rate, building on small steps so that each step can be mastered. Children are also encouraged to support each other's efforts, fostering an attitude of generosity and cooperation. According to Kendall (1973) cooperation is the motivation, and not the competition. Based on this principle, studies and games are conducted in learning courses with no consideration for competition and scores.

Parent Involvement*:* Just as a parent models correct speaking during language learning, the Suzuki parent guides music practice every day at home, encouraging and motivating in a positive way.

Approaches to learning through play also support these views. According to Su and Cheng (2015) if parents encouraged students to adopt game-based learning, students would approach this new mode of learning more confidently. Through gamification not only can we create a mindset that encourages students to try new things without being afraid of failing (Lee & Hammer, 2011), but also enable students to engage in enjoyable experiences.

Environment and Listening*:* Children learn to understand speech and to speak in an environment saturated with language. In the same way, music must be part of a child's environment. Students listen frequently to recordings of the music they will be learning to play. The more music is a part of the entire family's enjoyment, the better.

Group Lessons: Children practice their language skills by talking with friends of their age. In the same way, children can develop their musical skills by playing with other children who are playing the same music. Students at all levels play together. Older students help the younger (Kendall, 1973). Group lessons build motivation and community. According to Keller (1987) motivation and attention cannot be considered separately. In Scott's (1992) study, Suzuki students scored significantly higher than the home group and

slightly higher than the other preschool groups on all attention task measures. It is thought that preschool students have a high level of attention thanks to the games and focus studies in the Suzuki classes.

As can be seen from the above principles, Suzuki has established a system that positively supports learning both inside and outside the classroom. How to implement this system is also provided by teacher training programs. The Suzuki method is highly standardized, with much uniformity between teachers all over the world (Brathwaite, 1988). This standardization is due to the emphasis on a high level of teacher training, as specific sequencing throughout the repertoire is a crucial aspect of the method (Perkins, 1995).

While the related researches include the philosophy, principles, applications, educational game production of the Suzuki method, development of the method in line with technological developments is very recent. In one of these studies, Wang, Wang, Chen et al. (2012) developed a real-time feedback system in order to play with correct intonation. This real-time visual feedback is intended to maintain the learner's motivation when practicing violin alone. Suzuki has used the music and voice recording technologies of the time effectively. Since the listening dimension is one of the most important components of the method, Suzuki makes the students listen to the tapes recorded by him. It also takes audio recordings of these students within the scope of micro-teaching. Especially in the teacher education program, graduation recitals are evaluated by listening to the sound recordings (Hersh, 1995). According to Thibeault (2018), Suzuki practitioners often noted the motivational aspect of tape-recording students: "The child is fascinated to hear his own playing. He loves to play just for being tape recorded."

It is obvious that Suzuki developed his method to the last moment in parallel with the spirit and technological developments of the time. In this context, the contribution of the current QR technology to Suzuki method was examined in this research.

Method

Research Design

This research is based on case study method in an attempt to collect elaborate data regarding the students' attitudes and motivation levels towards the QR code game. According to Simons (2009) case study is an in-depth exploration from multiple perspectives of the complexity and uniqueness of particular project, policy, institution or program, system in a 'real life' context. Experiences of students in a school, the issue of cheating in another school etc. are known to be cases that are unique and special within themselves (Hays, 2004).

Among case study designs, the holistic single-case study was utilized in this research. According to this design, there is only one unit of analysis (an individual, an institution etc.). It can be used in the research of excessive, controversial, or authentic cases, as well as the ones never studied before, in an attempt to confirm or disprove a well-formulated theory (Baxter & Jack, 2008). Applications regarding the use of QR code technology in instrument education have just emerged in literature. Single-case study design was used in this research due to the need for a deeper knowledge.

Study Group

One of the methods that can be used in the selection of the study group is the criterion sample (Geutterman, 2015; Patton, 1999) in order to form a homogeneous group in the study, voluntary students who were learning violin by Suzuki method, and participated in group lessons together at Suzuki 1st Book level were selected. According to these criteria, the QR code game practiced with 4 violin students aged between 9-14 total of 15 lessons. Due to ethical rules, permission was obtained from the parents. Codes such as S1, S2, etc. are used instead of names to protect students' private data.

Aim and Development of the QR Code Game

The main aim of the QR code game is to enable the students to develop the pieces by repeating them with a fun approach, with different technical and musical games. Music, movement, rhythm are the basic components of these studies. The essential technical tips about pieces are loaded in the QR codes. According to the philosophy of Suzuki (2010) and Preka and Rangoussi (2019) the game should not be designed to be highly competitive and produce a single winning team. Instead, all teams could become winners upon completion of their missions. The game should be designed at the right level of difficulty for the pupils to challenge them, gain their interest and yet be enjoyable. The technical aspects must be difficult just enough to make pupils try harder, remain engaged and get satisfaction from success. To provide these principles the QR code game consists of two parts: White and Yellow- Fun cards. White cards are designed to predict pieces from technical tips. And Yellow- Fun cards are designed to increase the repetition of the tracks and to provide greater motivation.

Cognitive task analysis (CTA) was used to determine the tips to be loaded in the QR codes. CTA is an extension of task analysis techniques that provide important information, thought process, and target structures for the realization of observable task performances and include important cognitive activities such as planning, diagnosing and decision making (Yusof & Yin, 2010). Many different research techniques can be used in cognitive task analysis. Observations, interviews, verbal reports and techniques that focus on concepts and inter-concept relations are the most commonly used (Schraagen, 2006). First of all, the technical and musical analysis of the Suzuki Book 1 pieces was conducted, and important right-left hand techniques such as holding the bow, staccato, circle bowing, fingering positions and musical expressions such as allegro, mezzoforte, forte, piano, crescendo were determined for each piece. On the other hand, an activity pool was created for yellow-fun cards. The analysis and activities were shared with three different Suzuki experts. Experts tested the tasks by playing them. Of all the tasks, the ones which were found inappropriate for the students' age and physical activity levels were eliminated. For the content tests of both the tips and fun cards, the expressions and phrases were shared with a language specialist.

On the white cards, the statements of guessing game such as 'I'm the first piece to start up-bow', 'My name means play cheerfully'. On the yellow cards, there are expressions of fun activities such as 'play with your eyes closed', 'play while walking'. The expressions were encoded using the free online QR code generation site (https://www.the-qrcode-generator.com/). The tips in the codes which were downloaded in PNG format were printed out.

How to Play QR Code Game

Preparation: Preparation: Before playing the QR code game, QR code scanner application needed to be downloaded to at least one of the mobile devices in the class. In this research Layar and QR Code Reader were used.

Application: The Figure 1 shows how the QR code game is played.

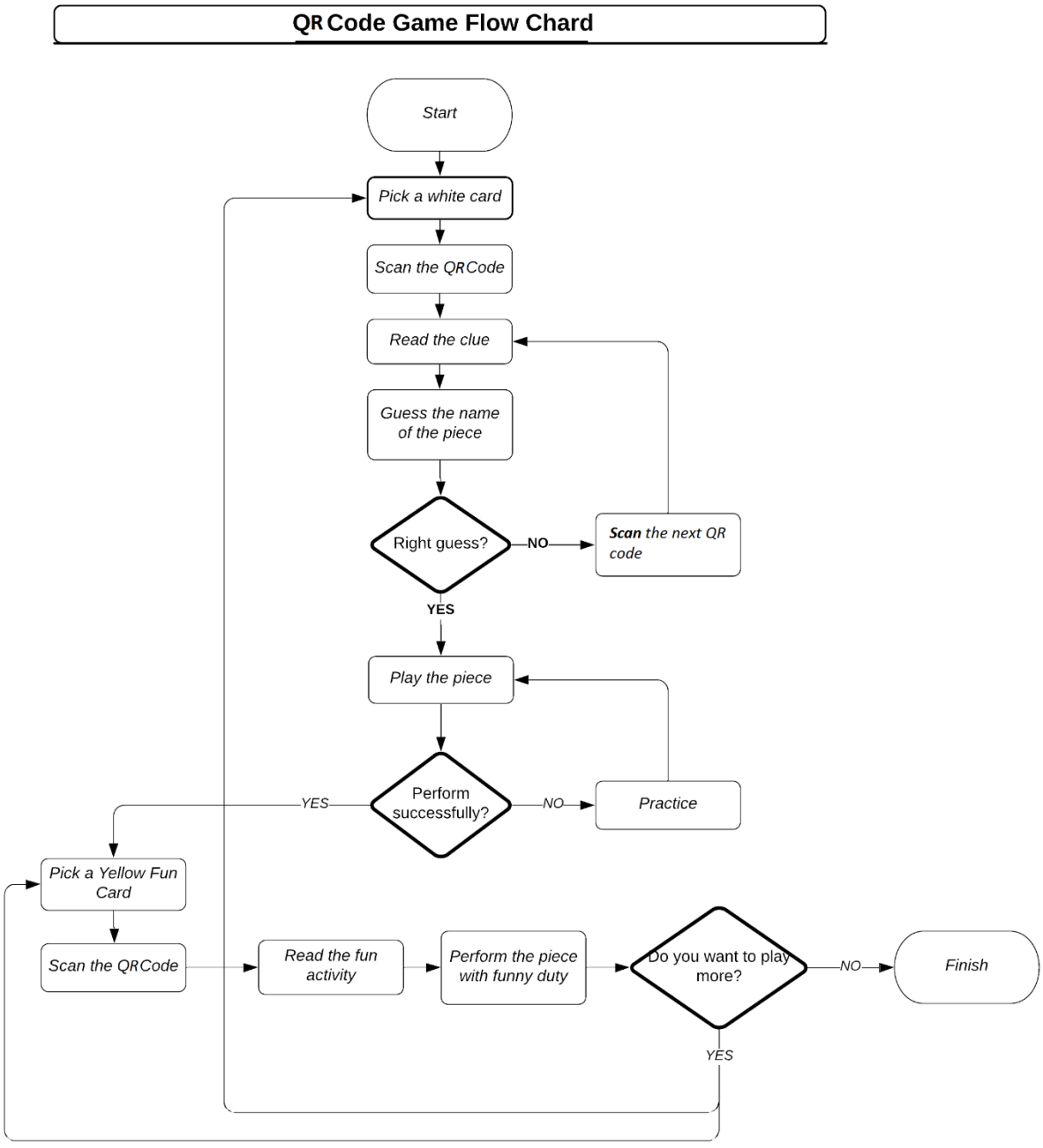


Figure 1. QR Code Game Flow Chard

In group lessons, one student selects one of the white cards and reads the code. Meanwhile, the other students try to guess the piece quietly. The entire group performs the tasks on the yellow cards.

Data Collecting

Case studiesenable the thorough research of the analysis unit. Therefore, data crossing is an important characteristic of the design, the aim of which is to provide a profound, rich, and contextual explanation. Data for various sources increase the reliability of the study (Smith, 2018). According to Stake (1995) and Yin (2009), six data sources are typically used in qualitative case studies, which are documenting, archival records, interviews, direct observation, participant observation, and physical pieces. Descriptive and confirmatory data collecting tools were utilized together in this research, in an attempt to collect more elaborate opinions with the help of different perspectives on the use of QR codes and to increase the reliability of the data. Teacher

observatory notes and student interviews were consulted for descriptive tools; while student attitude form and expert opinions were consulted for confirmatory tools.

Observations: During the game, responses to white and yellow fun cards were observed with a motivational focus. The observations were based on Kelleher (2015)'s observable motivational behavior chart. There was no video recording during the observation in order not to affect the students' natural behavior.

Student interviews: The students were asked for their ideas, thoughts and feelings after each application. These questions were formed in parallel with the motivational experiences during the application.

Student Attitude Form: To verify observations and interview data, a five-point Likert type attitude form consisting of 10 items was prepared by the researcher. Expert opinions of a linguist and pedagogue were received.

Expert Opinions: Three Suzuki violin experts were consulted for their opinions while analyzing the accuracy of the tips identified for the QR code game by the researcher, as well as the appropriateness of tasks written in the cards.

Validity and Reliability

To ensure the validity and reliability of qualitative studies, the methods of source and theory triangulation (Finfgeld-Connett, 2010), concept or case based multidimensional analysis (Jansen, 2010; Miles & Hubermann, 1994), and response confirmation (George & Apter; 2004) in literature were suggested for the researcher. Case studies allow the analysis unit (case) to be researched elaborately. For this reason, data triangulation is a substantial characteristic of the research design, the aim of which is to provide a thorough and contextual explanation. Data collected from different sources reinforce the reliability of the study (Smith, 2018). In the study, data collecting tools were diversified first, in order to establish its validity and reliability. Observations, student interviews, student attitude form, expert opinions were consulted.

A total of five main approaches were mentioned for the reliability of data obtained: skeptical analysis, constant data comparison, inclusion of cases revealing deviation, and use of tables. While the data are obtained from authentic sources, researchers must constantly carry out comparisons on their own or with their colleagues and make confirmations in terms of form and context (Patton, 1999). Following the coding process, themes and tables of codes were shared with a field specialist to check the data. The data were rearranged and finalized upon consulting to an expert opinion.

Data Analysis

The study is based on qualitative data analysis method. Data obtained from observations and interviews were decoded and transferred to Maxquda 12 qualitative analysis software. Pre-structured case system was utilized while conducting the content analysis. The supportive data obtained from the student attitude form were presented in a table by taking the average and percentage values through basic statistical procedures.

Findings

As a result of content analysis, tree main titles have emerged: spontaneity, willingness to keep playing and desire to develop game.

Spontaneity

Spontaneity refers to the cases occurring from the inner motivation of students, without any direction by the teacher. Field notes and interviews revealed that QR code game attracted attention from students. According to field notes, the teacher directed the students to play the game in only one application out of 15. The students were eager to play the game in the other 14 applications, without any teacher direction. At this point, there are two things happened which can be regarded as a motivation indicator.

"In one of the courses with S4, we made intense bowing practices for Gavotte and Happy Farmer pieces. We practiced exercises which focused on S4 relaxing his/her arm and improving his/her bow holding technique. At the end of the course, which required intensive listening and concentration, I asked S4 whether s/he wanted to pick one of the QR codes. S/he said 'That's the moment I was looking for!' with a great eagerness and started selecting between the papers with QR codes".

Another indicator of high motivation was with S1 and S2. "I usually play a rhythm game in the garden, with students who come to the lesson early. They mostly come earlier for this specific reason. In one of these games, S2 said 'Let's go to the class and start doing QR codes' and S1 screamed 'Yesssss!' and they ran up to the class". Choosing the QR code game over this rhythm game, which they loved, is a huge indicator of their motivation.

Another spontaneous case, which showed the motivation of students, was downloading the QR code scanner. "During one of the applications, when I approached to the desk to give S4 my phone to scan the codes, s/he said that s/he had already downloaded a QR code scanner on the phone. S/he also said it was the first time they played a QR code game and that they started realizing other QR codes, so s/he downloaded the application out of curiosity. It can be suggested that the game has raised a certain awareness of QR codes.

Willingness to Play the Game

Another significant datum indicating the motivation of students is the number of cards picked in every application. The game was normally based on guessing the piece by selecting a white card and performing the entertaining task by picking a yellow card. But it was observed that the students were willing to select multiple cards. It was figured that each student picked three cards in a total of 3 applications, and two cards in 8 of them.

The students were eager to keep playing the game although the time was up. "S4's mother called and said that she rescheduled the time of his/her training for one hour later. Actually, S4 had to leave the course immediately. But s/he said s/he wanted to select another card. S/he picked one more card saying 'maybe this time I pick something short', and scanned it on the phone. This time it was actually a short task which was "Play very lightly". It was a code that really overlapped with the bowing practices we made throughout the class.

The willingness of students to select more cards is thought to be caused by the curiosity factor. The impossibility of learning the tasks in QR codes without the application raised a curiosity among students about their content. They were trying to guess what kind of piece or entertaining task they were about to select, before picking the card.

S4 and S3 were willing to keep playing the game regardless of the unsuccessful experiences. For instance, S4 was unable to guess the piece despite the tips in the first application, could barely guess after having a question-answer process, and failed to play the piece; yet still, s/he said "That's the moment I was looking for" in the next lesson and wanted to play the QR code game. S/he had a positive approach towards the lesson by saying "I enjoyed it the last time. I was unable to guess the piece, but anyway. It is so much fun to study with QR codes". At the end of the application, s/he was able to guess the piece and play it much more easily.

The results of the attitude survey applied to students at the end of the application overlap with these observations. Statements and students' responses are provided in Table 1.

Table 1. Student attitude on QR code game

Statements	Responses	
	Av.	**%**

1	I like the lessons we have with QR codes	5	100
2	I really enjoy the violin lesson when we practice with QR codes.	5	100
3	I wish we had more activities with QR codes	4.5	90
4	I wish QR codes were used in other courses as well.	4.5	90
5	When the lesson with QR codes is over, I wish to continue more.	4	80
6	I prefer doing other activities in violin lessons rather than the QR codes	1	20
7	I think QR game is a waste of time.	0	0

As seen in the Table 1, all of the students expressed their appreciation of the lessons with QR codes. They requested more activities with QR codes and to use these codes in other courses, too. They stated that the duration of the application was too short and that they wanted to continue playing it. Only one of the students preferred other activities instead of QR codes.

Willingness to develop the game

During the short interviews after each practice, the students made suggestions to improve the game. These suggestions and the willingness to develop were considered as an important indicator of motivation. They offered the diversification of the yellow cards and proposed the addition of the following tasks:

- Play by jumping at holds.
- Play by crouching
- Play while lying on the ground
- Play with your feet off the ground
  (S1: How are we supposed to do that? Like ninjas?
  S2: If we sit on a chair on our knees, our feet will not touch the ground)
- Play while holding your breath.
- Play all the pieces you learned by starting from the G string (in 1A- 1B- 1C- 1D positions)
- Play while looking at the mirror (S2: There are usually glasses instead of mirrors. We may look at our reflection from these glasses)
- Play the violin without the shoulder rest.

As it can be seen, students offered applicable suggestions. Although playing by jumping at holds is not possible in all pieces, it can be supportive for the counting of holds. Playing by crouching will give flexibility to the body and enable a more comfortable playing, as well as making the practice more entertaining. Playing while lying on the ground is a method used by Suzuki, too. Normally, the violin is played in vertical position. Playing it in a horizontal position is an important practice for understanding the function of bow weight. Playing with your feet off the ground can be seen impossible at first. With the help of this task, students may be encouraged to think creatively and improve their problem solving skills. If playing while holding breath is turned into "hold your breath at the beginning of each sentence", it is believed to be more helpful for students in terms of learning the musical sentences and develop their expression skills.

Playing all the pieces by starting from the G string is also a method used by Suzuki. When a new string is learned, previous pieces may be applied on this string and therefore ensure an easy transition. Playing the piece in different left hand positions is an excellent suggestion which allows the students to try a piece with different positions. For instance, the piece Twinkle is played in A major tone, in 1A position. In 1B position, the 1st and 2nd fingers are pushed side-by-side by which a modal tone close to a minor sound is obtained.

Playing while looking in the mirror is a practice method suggested not only by Suzuki, but also by all instrument teachers. The control of issues such as position-holding or correct bowing are recommended to be

practiced in front of a mirror. Playing the violin without the shoulder rest may be applied in an attempt to teach the students the difference in shoulder and left hand comfort in cases with or without the shoulder rest.

The students also provided suggestions on the ways of selecting white and yellow cards, which are:

"Let's do the wheel of fortune. We can put the QR codes on the segments of the wheel, turn it and play the piece it stops at."

"Let's hide each card to a different place. We can use a map to read how to find the tips. We can reach to the piece by collecting the tips."

It was observed that the students proposed these suggestions in an attempt to make the process of card selecting more fun and adventurous. Turning the process of card selecting into a geocaching may enable the students to play the pieces in different parts of the class. When it is designed in a way where the student is not able to access the next code without playing the piece, it may serve as a supporting activity for them to reinforce the whole repertoire before the certificate examination.

Result and Discussion

According to the findings, it was observed that the QR game significantly increased students' motivation. Students requested to play the game in almost all of the applications without the teacher offering it. They wanted to play the game by leaving other activities they love. And most importantly, they volunteered to come up with ideas for the development of the game. They were eager to play the game even when they had trouble guessing the tasks in the codes.

In the study, the QR code game was designed as a two-staged game, consisting of white cards and yellow cards. In white cards, students were asked to guess the piece based on the tips about the bowing, left hand techniques and melody structure from different levels of difficulty. In the first couple of applications, students had little difficulties in guessing the piece but then got used to the way of thinking and had no difficulties. According to Gee (2007), educational games play a vital role in developing skills such as critical thinking, problem solving, innovation, creativity, social relationships, and effective use of technology, with the help of a progressive level of difficulty. With white cards, students had the chance to discuss cognitive processes regarding violin playing. The students stated that they were slightly worried about picking a card with a piece they did not know. Such a hesitation is in the nature of the game. Kiili, Freitas, Arnab et al. (2012) asserted that in their study conducted on the process of educational video games, students start with easy tasks first, and they keep going in the game as long as the difficulty level is in line with the student's level. However, in the event that the difficulty level gets higher than the psychological limits of the student in the following levels, their potential underperformance may cause a sense of concern. The students were observed to reflect similar attitude when they faced with an unknown piece.

After having guessed the pieces in white cards, students selected one of the yellow cards where they got to perform different musical tasks. The aim of yellow cards is to improve the performance of the students by means of assigning them to a task challenging their musical or psychomotor skills. Indeed, half of the students expressed their difficulty in performing the tasks written in yellow cards. When this was associated with the motivational data, it was concluded that students did not give up the game despite the difficulty they experienced. In the flow theory, Csikszentmihalyi (1990) mentioned the effect of the studied subject on the flowing status of the difficulty level, and stated that an optimal performance is accomplished in not-so-challenging or non-deterrent levels of difficulty. Based on the students' willingness to continue, the QR code game can be suggested to embody a certain level of difficulty enabling this state of flow. It is possible to observe avoiding among students, in cases where the difficulty level is higher than the students' ability. In this research, the students were observed to reveal the opposite, with a high motivation. As an indicator of

motivation, they wanted to keep playing upon their own will, and showed their willingness to do so even when the lesson was over. In the literature, students' spontaneous willingness to participate in the process of learning is defined as inner motivation. When people are motivated, they participate in the activities with devotion, and without any expectation of reward (Deci & Ryan, 1985). Lepper and Cordova (1992) showed that computer games stimulate inner motivation by putting a price such as "winning the game" or "learning the content". In this study, the students got to select one of the entertaining cards for each piece they guessed correctly or played with only few mistakes. In this context, the QR code game was designed in a way that raised inner motivation. The result is consistent with the other studies (Chen, 2015; Cooper, Hedges & Valentine, 2009; Magalhaes, Monteiro, Carvalho et al., 2018; Paule-Ruiz, Álvarez-García, Pérez- Pérez et al., 2016) suggesting that the use of mobile devices in music education contributes to the motivation of students.

During the application of the QR code game, several unexpected learning opportunities were discovered. The game allowed students make their own explorations about bowing, musicality, different finger numbers, and practicing in different positions. With tasks such as "writing a story for the piece", students were able to reveal their affective aspects and individualize these experiences.

As a result, it was found that the students had a rather positive attitude towards the QR code game played in Suzuki violin lessons; it helped them uplift their inner motivation; and that active participation in the game led to a positive and entertaining learning environment. In the study, only tips in the form of sentences were added in the QR codes. In future studies, these codes may contain directions which lead the students to videos and internet sources about the composer or how to play the piece. Based on the student suggestions, the QR code game can be turned into a geocaching, as well, and its effect on performance and motivation can be researched. Data about the opinions and attitudes of students on the QR code game were obtained through interviews and observations, which were limited to a short application period. The impact of QR code game on the student performance and attitude can be analyzed in a long-term study.

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