

# Engaging Pre-schoolers in a Musical Experience: A SCAMPER Technique Study

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**Abstract** Music appreciation is one of the art experiences introduced to pre-schoolers. Music is perceived as one of the best tools to be integrated into the teaching of other subjects across the curriculum in early childhood education. This study aims to understand the use of the SCAMPER technique as a guide for teachers in helping them create a developmentally appropriate musical instrument to aid in their teaching. This study applies the use of SCAMPER technique which is one of the idea generation techniques widely used in the design discipline. Sixteen students enrolled in an Early Childhood Education programme participated in this study. Six sets of musical instruments were developed and analysed for its design and practicality for use in pre-school classroom teaching. The study concludes with the discussion on the effectiveness and limitation of SCAMPER used in musical instrument design.

**Keywords:** SCAMPER, Early Childhood Education, preschoolers, Musical Instrument, Idea Generation Technique

## INTRODUCTION

Teachers often have to be creative in engaging learners in learning activities especially pre-schoolers who are known to have a short attention span. Developing teaching aids that are able to attract and sustain pre-schoolers' interest can be a challenge to teachers with no design background. Not only the teaching aids have to fulfil the pedagogical requirements, at the same time it should allow for interaction and exploration of the pre-schoolers. With the focus on the development of teaching aids that could engage pre-schoolers in a musical experience, SCAMPER technique was introduced to a group of students enrolled in the Early Childhood Education Programme in a private higher education institution to guide and improve the creativity in generating ideas in their design of teaching aids for preschoolers.

## LITERATURE REVIEW

### *A. Music Teaching and Children Development in the Malaysian Context*

Early engagement of music in the children curriculum makes a beneficiary impact for wider development [1][2]. Music is perceived to have important roles in the lives of young children and thus, there are strong recommendations to introduce music as a subject to be taught within school curriculum around the world. Music plays many functions in children's life, e.g., serving as a mean for their emotional expression, aesthetic enjoyment, entertainment, communication, symbolic representation (expression of symbols through song text or sound within a cultural meaning), physical response (through creative movement and dance), enforcement to social norms (through song texts and movement), integration of society (children socialized through music and identified their membership within a group) [3].

Campbell and Scott-Kassner argued that music deserved a right place within the school programmes from

preschool through elementary level. They believed that music as cultural heritage, children has their right to own it, giving equal rights for children to develop their aural, expressive, artistic and musical sensibilities, and giving chance for children to learn music beyond those currently popular and being commercialized [3]. Music experts and early year educators tend to agree that early musical exposure is beneficial for stimulating all rounded development among children, e.g., motor skills (through music and movement activities), linguistic and non-linguistic skills (e.g., though recognizing the sound patterns, awareness in phonemic, recognizing and remembering words) [4]; physical development, communication, creativity, social and emotional development [2, p. 4].

In Malaysia, music is introduced under the component of "creative and aesthetic" in the National Preschool Curriculum along with another two art forms, i.e. drama and visual arts [5]. Overall, this component seeks to achieve six objectives: (i) appreciating music from different genres, (ii) performing creative movement upon hearing on the music being played, (iii) character play based on story, (iv) applying the learned knowledge in artwork, (v) producing creative artwork via various techniques and materials, and (vi) appreciating own and others' artwork [5]. Within this component, music is taught through four contents to pre-schoolers: (a) singing songs from the different repertoire, (b) playing of the percussive musical instrument, (c) performing the movement with music, and (d) appreciating music from different genres [5]. In terms of percussive instrument playing, the National Preschool Curriculum is looking to enable children to actively participate in sound exploration and making music via using their own body parts (body percussion), percussive instruments and creative objects. Apart from that, creative sound exploration and listening activities are also encouraged within the music teaching and learning process.

### B. Instrument Design to Teach Music

There are many types and categories of musical instruments. One of the categories is non-pitched percussive instruments. Non-pitched percussive instruments are rhythm instruments that could be categorized into membranophones and idiophones [3]. Membranophones are largely made up of the drum family that generates sound through a vibrating membrane or skin while idiophones refer to those instruments that produce sound without membrane through shaken, beaten or scraped actions[3]. Common classroom nonpitched percussive instruments are such as wooden sticks, wood blocks, tambourines, castanets, various types of drums and folk drums, jingle bells, cymbals, gongs, and self-made musical instruments. The playing of non-pitched percussive instrument can be conducted solo or in a group, and playing may be with or without pitched instruments e.g., piano, xylophone and guitar. In many cases, it can be integrated into teaching across other curricular subjects, for instance, to accompany stories, poems, chants, and adding leitmotif-like sounds to symbolize story characters [3].

### C. SCAMPER

SCAMPER is an abbreviation of a seven-step idea generation technique which consists of Substitute, Combine, Adapt, Modify, Put to another use, Eliminate and Rearrange. It is one of the many tools for idea creation. SCAMPER was developed originally by Alex Osborn [6] as a brainstorming method and extended by Bob Eberle [7], [8] which convolve it into a tool to push creativity. The SCAMPER technique was known to be a “divergent thinking process and a fun technique” [9, p. 33] that could improve users’ creative expression [10] and their creative knowledge and confidence [11]. SCAMPER technique is known to be an effective technique in generating a large number of novel ideas [12]. The SCAMPER technique was also most effective when a combination of three or fewer techniques was used in a design [13].

This study, therefore, introduced the SCAMPER technique as a guide for teachers in helping them create a developmentally appropriate teaching aid for preschool teaching. This study is scoped towards the creation of nonpitched musical instruments that could not only attract and build interest but also to allow for meaningful sound exploration activities (e.g., the concept of timbre) and the learning of rhythmic concepts (e.g., the concept of beat, articulation, speed and rhythm pattern) among pre-schoolers.

### METHODOLOGY

This study employed a qualitative methodology using an observational approach to understand the effectiveness of the SCAMPER technique for the creation of a musical instrument design by non-design students. Sixteen students enrolled in an Early Childhood Education programme from a private higher educational institution voluntarily participated in this study. These students have a limited knowledge of design and the majority have not taken lessons in

playing musical instruments. The students formed a total of six groups with two to three members each. Each group was assigned to create a three-in-one non-pitched instrument that consists of a minimum of three musical functions. The students were encouraged to use recycled items for their creation. The developed musical instrument should produce good quality sound and is suitable for teaching children in a preschool classroom environment. The students were briefed and did an exercise on the SCAMPER technique. They were then given a timeline of four weeks to develop the musical instrument. Each week, the students consulted and documented their progressive development. At the end of the fourth week, they presented and performed a song using their musical instruments. The sets of musical instruments developed were then analysed for the design and practicality for use in preschool classroom teaching.

### FINDINGS

At the end of the study, six three-in-one musical instruments were created by the students. The students were able to achieve the study requirements and delivered on time.

#### A. SCAMPER Technique Used in Musical Instrument Design

The students mostly adapted their designs into a transportation or an animal form (refer to Figure. 1). The most common recycled material used was paper (e.g. cardboard, newspaper) probably because it was the easier to work with. Other recycle materials used are hard plastic (e.g. pipes, bottles, bottle caps, cups, etc.), glass (e.g. bottles), wood (e.g. planks, sticks, and ropes), cloth and metal (e.g. aluminium tins, nails, utensils, wires). The findings of the study are shown in Table 1. Shots of the students’ creation is shown in Figure. 1.

Table I. Analysis Of Scamper Applied In The Percussion Instrument Design

Group	Instrument design		
	Type of non-pitch instrument design	SCAMPER used	Design Concept
A. The Indiana Cup	Shakers (4 var.) Drum (2 surfaces) Güiro Tambourine	Substitute, Modify, Combine, Rearrange	Lion
B. Twinkling Bears	Gendang Güiro Shakers (2 var.)	Substitute, Adapt, Combine	Bears
C. Choo Choo Train	Drums (2 surfaces-hard paper, hard paper attached with bells) Shakers (5 var.)	Substitute, Adapt, Modify, Combine, Put to another use	Toy train
D. Nasi Lemak	Drums (1 surface-balloon) Güiro (hard paper) Beater (wooden sticks) Handbell Shakers	Substitute, Adapt, Modify, Combine	Dinosaur

E. Blu Blu Fish	Shakers (2 designs- bottles, buttons, bottle caps on strings) Güiro (wooden sticks) Drum (6 surfaces-aluminium cups with different sizes, metal, plastic) Beaters (2 designs, mallet with head, gloves attached with nuts) Castanets (2 var.)	Substitute, Adapt, Modify, Combine, Put to another use, Rearrange	Fish
F. Chitty Chitty, Bang Bang	Gendang Shakers (2 var.) Güiro Castanets	Substitute, Adapt, Modify, Combine	Racecar
		Put to another use	

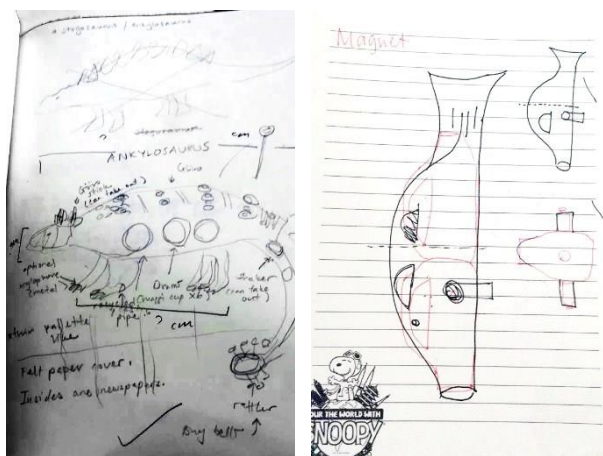
platform for the students to understand the design process better. One of the students shared that “SCAMPER has guided me and give me a very clear kick start on what to design for the musical instrument and the technique I used the most is Substitute”. Another student feedback that the SCAMPER technique helps in easing the creativity block to design the musical instrument.

One of the students, however, explained that she needed more time to explore the SCAMPER technique as she was not familiar with the design process. She tried to apply all of the techniques into the musical instrument design and was struggling as a first timer using the SCAMPER technique. Of the sixteen students who participated in this study, fourteen agreed that “Substitute” was the most helpful technique followed by “Combine”. During the ideation phase, the students actively participated in idea generation with the help of their respective lecturer. They sketched out their ideas before crafting their musical instrument. As this assignment requires the creation of a three-in-one musical instrument made from recycled items, the students heavily applied “Substitute” and “Combine” techniques to form their musical instrument as they felt is easier for them to applied the technique in their design. For instance, Group A combining the recycle items such as cans, cardboards, bottles and metal nuts to create an animal-like shaped musical instrument. In general, the SCAMPER technique provided seven different techniques that allowed the students to explore what to use for their design.

#### B. Musical Instrument Design as Teaching Aid

From the perception of their music lecturer, there were several improvements in their creations which are 1) the quality and variety of sound production, 2) creativity in material selection and manipulation strategies, and 3) developmentally appropriate design. Firstly, in terms of sound production, students have shown creativity in generating different sound qualities by using different materials and combination ideas in their creation. It was observed that the musical instrument designs were capable of producing non-pitched sounds from a range of high to low register with a variety of colours (e.g. light, dark, and crisp sounds). These outcomes resulted when students attempted to use different membranes to construct the drumming surfaces (e.g. plastic, tapes, balloon, aluminium), creating drum beaters with different heads (e.g. wood, plastic, rubber) and modifying beaters into a different form (e.g. hand gloves attached with metal nuts). In terms of shakers, the sounds produced were found to be rich in timbre (sound colour/quality) which resulted in the modifications and combination of fillers (e.g. the single-use or mixture of beads in different shapes and sizes, grains, nuts and sand). These attempts were found to be helpful in providing children with various sources for creative sound exploration and rhythm patterns.

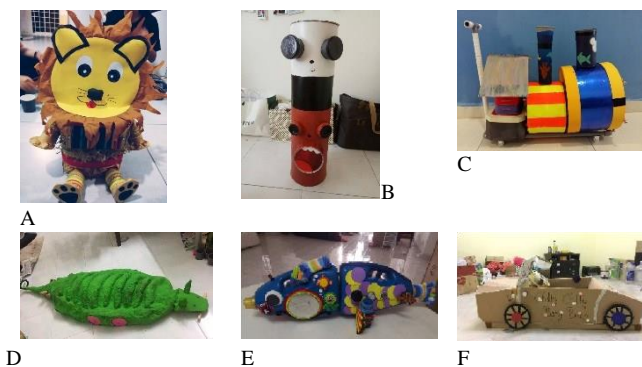
Secondly, students were found to be comparatively creative in the material selection (e.g. a combination of different types of papers, plastics, glass, aluminium and others) and manipulation (combination of materials, deciding and applying art skills). Everyday objects such



D

E

Figure. 1. Design Sketch from Group D (left) and Group E (right)



D

E

F

Figure. 2. Non-pitched musical instruments developed by each group in the study

**A. SCAMPER Technique for Non-Design Students** Short interviews were conducted to gain insights into students' perception of the SCAMPER technique. The interview was conducted with the student in their respective groups. Two questions were asked of the students which are

- 1) What do you think of the SCAMPER technique?
- 2) Which SCAMPER technique helps you best at designing?

Overall, the students agreed and were content with the SCAMPER technique as helpful in their design process. As the students were from a non-design background, SCAMPER technique was believed to have created a



as chopsticks, mittens, and buttons were repurposed and arranged in the design to function as sound production tools. It contributed to a more developmentally appropriate physical design for preschoolers, in which it was attractive in colours and concepts that were being neatly constructed, durable, able to allow for rough play, and able to sustain for longer play duration.

Thirdly, the students showed sustainable creativity in creating a developmentally appropriate design for preschoolers. The designs were not only attractive and appealing visually but also in musical function. In any learning process, the first step is to grab attention [14]. Popular animation characters were adapted as the concept or visual designs of the instruments. These features were able to stimulate children's interest and curiosity to explore the instrument, at the same time able to create a sense of familiarity through cultivating their memory towards those animation features. For musical functions, classic non-pitched musical instruments in the general classroom such as hand-bells, tambourine, maracas and drums were modified in terms of its playing method and features. The concept of a three-in-one musical instrument was found to be well executed in terms of design as a multifunction teaching aid as it can be served as musical instruments, as well as playing aids to encourage active problem solving (dismantling and assembling the products). Also, the final products were found to be developmentally appropriate for pre-schoolers, in terms of colour, size, weight, the material used, and play features, allowing better interactions between players.

## DISCUSSION

The challenges faced by non-design student due to the lack of design knowledge and instrumental skills have led to a less effective output in the design. Though the SCAMPER technique has shown to be a useful tool for creative generation ideas for the visual design, it somehow detracted the students from the exploration of ideas on the function of the teaching aid, i.e. non-pitched musical instrument to teach rhythmic concepts. While teaching aid designs need to be appealing and attractive, it also has to achieve its pedagogical purpose. It is a general design principle that form follows function [15]. For this study, it would suggest that the visual design (form) of the musical instrument takes should be chosen based on its intended purpose and function. Users immersed in the SCAMPER technique must ensure that the ideas generated fit the purposes of the design as this idea generation technique could lead to a wide combination of idea output.

It was also noted that while SCAMPER is able to help the students to be more creative in idea generation, it did not help in the execution of the idea. It was seen in the outcome of Group D's design where the initial idea and design was promising (refer to Figure. 1) but the execution of the design failed as the students lacked the skills to carry out the construction of the musical instrument design (refer to Figure. 2). Hence, the skills needed to deliver the design to its final output need to be instilled in the students in order to realize the idea.

Compared to Group E's design, where the group members applied most of the SCAMPER technique and the group able to come out with a creative fish design using a used bottle and mixtures of items.

Elimination technique was not found in the student's design. The students tend to put most of their ideas into the design hence making it hard for them to eliminate some part that is not necessary in their musical instrument.

## CONCLUSION

This study has determined that the SCAMPER technique is useful as an idea generation technique for non-design background students. However, this study is limited to the findings collected from a group of students within a single university. The study is also limited to the perception of the instructors and students and has yet obtained feedback from the targeted audience who are the pre-schoolers.

## ACKNOWLEDGMENT

The authors would like to thank the participants of this study and various parties involving in the development of this article.

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