

An Investigation into the Effects of Classroomlayout Andteacher Involvementon Creativity of Children

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Abstract: A place where children are often found engaging in creative art and design is at school in the art and design classroom. However, this is a situation where children are exposed to a number of different influences that include the teacher's involvement and the layout of the classroom. This paper examines the effect of the classroom layout for different aspects of teacher involvement on creativity in children. The methodology involves classroom simulations in two different classroom environments, traditional and adopted, the latter designed to reduce influence on the child, and considers creativity outcomes for different aspects of teacher involvement which include instruction, engagement and evaluation. The results reveal that the adopted classroom layout has differing effects, positive and negative, on different aspects of creativity.

KeyWords: Child Creativity, Adult Influence, Classroom Layout, Curriculum, Teaching, Child's Imagination

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I. INTRODUCTION

Children are under a number of different influences when they are being creative in the art and design classroom, such influences include those that are related to the teacher and how they engage with children and others include environmental factors. There are different aspects of teacher involvement when teachers engage with children that can have an influencing effect on creativity outcomes. In this study, these have been determined to be instruction

However, any study that focuses on the effects of such aspects of teacher involvement on creativity cannot ignore that there are environmental factors that also have an influence, which need to be considered as potentially equally influencing.

The layout of the classroom desks has been shown to have an effect on creativity. It has been claimed that for classrooms that have an open structure or open layout there are less teacher-initiated constraints and that these layouts inspire creativity (Amabile, 1996, Graetz and Goliber, 2002).

The main aim of the study is to investigate the effects of teacher involvement and desk layout together as influencing variables as an extension of studying teacher involvement or classroom layout alone. The study is based on the idea that these two forms of influence have a combining effect on creativity.

Specifically, the research focuses on the traditional layout of the classroom which has a more forward facing formal structure against a layout developed by the researcher based on principles of randomness and flexibility without any formal structure. The study recognises that the layout of the desks may not just have influence on children's creativity in relation to the teacher, but also how it relates to other children in terms of communication and inspiration.

II. LITERATURE REVIEW

Education and Creativity

The study is concerned with creativity in the classroom and how it is influenced by teacher involvement and classroom layout. The association between education and creativity, which includes teacher involvement and the classroom environment has been addressed by Runco (2014). Teachers can support creativity through their actions and attitudes, and teachers can also offer suggestions as part of the creative process as well as offering criticism and evaluation, however, this should be done carefully (Runco, 2014). The motivational aspect of the teacher has also been acknowledged, Plato said that that creative writing can be achieved by listening and being inspired by other creative writers, and the beliefs, attitudes, perceptions and behaviour of teachers can influence the intrinsic creativity in children (Tighe, Picariello and Amabile, 2003). However, there is the idea that teachers can constrain creativity. Potential creativity constraints in the classroom have been addressed by Gardner, 1990, Meador, 1992, Burkitt et al, 2010 and Roth 1996 and include evaluation and the importance of achieving grades,

restriction of materials and restriction of being allowed to verbally express inspirations. These constraints are not due to classroom structure, but to the attitudes and practices of teachers (Tighe, Picariello and Amabile, 2003).

Collaborative and Participatory Art and Design

Teacher involvement with children in the classroom is, to a greater or lesser extent, a form of participatory design depending on the type and level of involvement. It is important that teachers engage children when they are being creative and to respect the creativity of the children (Gattenhof and Radvan, 2009).

Involvement and Influence in the Classroom

The involvement of adults can be an impediment to a child's ability to develop artistically. According to Gardner (1990 p.ix), classroom learning has an influence on the style of the art. He argues that although models of the 'correct schema' are found in the art classroom and in textbooks, there is no opportunity to create art in an alternative way. He provides an example of young students in China producing paintings using the same classic ink and brush method (Gardner, 1990). These ideas are suggested by Meador (1992) who says that it is possible that education can inhibit the development of creativity in children that may be attributed to being constrained by social conventions or experiences in school generally.

Layout

Amabile (1996, p.206) says that open classrooms have less structure and less teacher-initiated constraints on creativity, furthermore such layouts inspire children to increase their effort, which leads to higher creativity. According to Clayton and Forton (2001) "Well designed traffic pathways can help students to move around the classroom safely, easily, and responsibly. This can improve transitions, help children to establish selfcontrol, and generally support a productive and cooperative learning environment" (p.50).

Thus, openness and flexibility are important and an approach based on the idea of an open classroom was adopted. This idea is supported in the literature where it is suggested the physical layout of the desks, specifically, open unstructured layouts increase creativity (Komendat, 2010; Graetz & Goliber, 2002; Reeve & Jang, 2006).

Another potential criticism of the TTCT is that Torrance encouraged that it should take place in an atmosphere that is fun and game-like in order to reduce the threat that is associated with testing, and testers were encouraged to create this atmosphere (Kim, 2006). The criticism here being that there is an encouragement to set the atmosphere of the testing environment beyond that which is being considered in the present study; i.e. to test different classroom layouts. Moreover, there is the idea that the testing atmosphere may affect creativity measures, hence the reason that Torrance encouraged fun, and likewise this encouragement of fun to promote or enable creativity may also have an effect on creativity measures and therefore, on the validity and reliability (Kim, 2006). The present study also manipulates the environment in a similar way by testing between the traditional classroom layout which is representative of power structures in the school and a new adopted layout that is designed to create a more relaxed and informal atmosphere in the classroom, therefore, if the TCTT were applied in the present study then there is the possibility, according to the aforementioned threat to the reliability and validity of the creativity measures, that reliability and validity will be affected by these experiment variables.

One theory that has been used to explain children's engagement and motivation in art is Achievement Goal Theory which says that goal orientations, such as performance goals i.e. showing ability, and mastery goals i.e. developing ability, are the reasons for engaging or avoiding tasks and can depend on perception of ability; moreover, these goal orientations can be context-sensitive, meaning that they are affected by classroom settings, practices and policies (Pavlou, 2006). In fact, engaging in art tasks is significantly affected by the task given by teachers and the pupil's perception of their own ability (Pavlou, 2006).

III. METHODOLOGY

Primary and secondary research methods were used in order to determine the influences of the layout of the classroom as well as the aspects of involvement by the teacher. The primary research included the use of interviews, questionnaires, classroom observation and curriculum analysis to determine how teachers engage with children, attitudes of teachers and classroom layouts, and experimentation to test the effect on creativity of aspects of teacher involvement and classroom layout. The evaluation of creativity in the experiments was achieved using CPSS and results of the questionnaire using SPSS.

Teacher Questionnaires

Questionnaires identified pedagogical practices by teachers which revealed aspects of teacher involvement as potential influences on creativity. The findings of the questionnaire informed the design of the experiments and included instruction, engagement and evaluation. The questionnaire was distributed to a total of

40 teachers from the Mecca region in Saudi Arabia.

The questionnaire revealed that the class structure was well defined with much time given to ideas and giving instructions. It was noted by the teachers that if they spend too much time on ideas and instructions then children tended to lose their concentration. The rest of the class time was dedicated to creative activity and evaluation and feedback. Teachers felt that their involvement and their role as facilitators were essential and they assigned much importance to this.

Interviews with Teachers

Semi-structured interviews were conducted in order to gain the experiences, opinions and attitudes of the teachers when engaged in creative activity with children. This was necessary in order to identify the different aspects of involvement in the classroom and the importance that teacher assign to their roles in the creative process. The revealed aspects of involvement both served to inform the variables of the experimentation and the overall discussion about adult involvement and influence in the creative process. The results revealed that teachers perceived themselves as facilitators and guides for the children which included giving children suggestions of how their work could improve. Teachers always brief about the topic and exercise and also checked that children were working according to task requirements. Teachers rigidly followed the teachers' book and ensured that children completed tasks on time. During the creative process teachers were very much involved through giving compliments and suggestions, and were hands-on when the task required. There was also evidence that the curriculum guided the structure of the class in terms of briefing the children, the exercise itself and discussion and evaluation at the end of the class. Overall, the interviews revealed that there were three main stages of the class, instruction, engagement and evaluation which included encouragement, suggestions, discussion, feedback and evaluation.

Observation of Classroom Teaching

Classroom observation was conducted to further understand the aspects of teacher involvement towards the development of the experimentation. The observation was conducted in primary schools in the Mecca region, Saudi Arabia. Again, there were two main concerns of the observation, firstly; to reveal teacher involvement, and secondly; to reveal class structure and classroom layout. The results confirmed the finding of the questionnaires and interviews, and in reference to classroom layout; it was found to be structured with a central podium for the teacher.

Analysis of Curriculum

The curriculum and the associated supporting materials for teachers play a central role in how teachers are involved with children in the creative process and the structure of the class. The Saudi curriculum for Art Education is comprised of three tiers of documentation including the curriculum disseminated from the Ministry of Education, the teacher's guide and children's workbooks. The specific documentation that was analysed was for primary school, year 6, for Saudi Arabia in 2016/17. In addition to class structure and methods of engagement there was a heavy emphasis on the development of practical skills and there was no evidence that the curriculum promoted individual creative or freedom of creative expression. Furthermore, the briefs for art and design class were found to be very restrictive and activities were very fixed.

Experiments

1.1.1 Experiment Variables

The experiment variables are included to test the various aspects of involvement by teachers which have been revealed by the primary and secondary research.

1.1.1.1 Instruction

The primary and secondary research revealed that instruction, as an important part of the art class, could have an effect on creativity. Instruction was found to constitute a large proportion of class time. Importantly, the primary research revealed that instructions by teachers has an effect on children because constraints are set about what should be created (Roth, 1996) and Freeman (1980) says that stimuli has an influence on child creativity. Instruction is tested as one of the experiment variables.

During the experiment the instruction that are given as they would be in a normal art and design class. However, instruction was also excluded as part of the experimentation and in this case absolute possible minimum instruction was given.

1.1.1.2 Engagement

Primary and secondary research showed that there are a number of different ways that teachers engage with children during creative activities. Ways that teachers engage children were identified in the primary and secondary research and included offering suggestions and feedback, encouragement and discussion, all of which have both positive and negative effects on creativity in children and are categorized under engagement.

Before the experiments take place, the teachers were briefed to engage children as they would normally in a class. In the experiments where engagement is excluded as a variable teacher are briefed to refrain from these types of engagement.

1.1.1.3 Evaluation

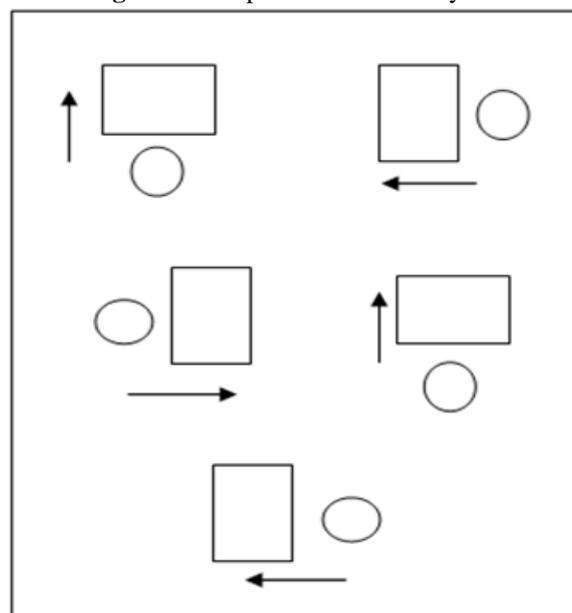
Where children are aware of the fact they are being assessed and they are under pressure to perform may affect creativity (Amabile, 1996, cited in Baer &McKool, 2009). Being focused on outcomes or achieving a goal can detract children from spontaneity and creativity and any criticism or evaluation could be damaging to the child (Cassou, 2004). The primary research of this study revealed that teachers had a high opinion of their personal opinion as being suited to judge children's work and that standards established in the curriculum were sufficient to evaluate creative ability. Where evaluation was tested as a potentially influencing factor the children were told that their work would be evaluated at the end of the class.

1.1.1.4 Layout

In order to determine the effect that the layout of the classroom had on the creativity in children, an adopted classroom layout was included as an experiment variable. The adopted layout was designed to remove any structure that a child would experience in a traditional classroom layout and was designed to allow children freedom in designing.

Literature about classroom layout considers both learning and collaboration between children in association with creativity. It was not the main concern of the study to consider all of the different types of layout, but rather to test the effect that aspects of teacher involvement have on creativity in children within both a structured and unstructured classroom layout. The adopted layout sought not to separate children from each other in order to avoid a sense of structure. Thus, the principles of an open classroom were adopted which included not to let children feel they are working in teams and no use of a central podium. An open classroom layout was achieved using a random layout (Figure 1) which both removes feelings associated with examination-type layout and collaboration while at the same time minimising feelings of isolation. Therefore, a balance was struck between a structured layout whereby children could feel they were working in isolation and an unstructured layout which removed class structure physically and in terms of teacher authority in a testing environment. Children are able to see each other and are free to move around the classroom, this would promote a level of collaboration between the children which is supported by the primary research of this study that suggested that children positively inspire each other.

Figure 1: Adopted Classroom Layout



1.1.2 Design of the Experiments

Primary and secondary research was used to establish the experiment variables which included teacher aspects of involvement and classroom layout. The primary and secondary research established the variables that needed to be investigated in the experiments, after which the structure and procedure of the experiment was designed in order to test these variables. Specifically, this includes the number of experiments and the different variables and possible combinations. Moreover, the procedure includes piloting, briefing teachers about the variables and sampling.

1.1.2.1 Experiment Procedure

The experiments are designed to test the effect of the different aspects of teacher involvement (instruction, engagement, evaluation) and classroom layout on creativity in children.

The experiment involved children engaged in creative art and design activities including and excluding the identified aspects of teacher involvement within two different classroom layouts, the adopted layout and the traditional school layout. The experiments took place as normal art and design classes, in the usual location and at the usual timetabled slot in order to ensure children were not aware that an experiment was taking place.

In total there were 20 experiments, two experiments at the beginning, two in the middle and two at the end were control experiments whereby all of the involvement variables were included for each of the classroom layouts. The other 14 experiments were designed to test all of the possible combinations of involvement variables for each of the two classroom layouts (Table 1).

Children are not told where they should sit in order to avoid influence (Reeve & Jang, 2006) and they are not told that they have to remain seated at their desk in order to remove a form of control.

1.1.2.2 Experiment Structure

Table 1: Design Experiments

Experiments	Control / Variable	Involvement of Adults and Layout (Variables)			
		INSTRUCTION	ENGAGEMENT	EVALUATION	LAYOUT
Experiment 1	Control 1	✓	✓	✓	School
Experiment 2	Control 2	✓	✓	✓	Adopted
Experiment 3	Variable 1	✓	✗	✗	School
Experiment 4	Variable 1+2	✓	✓	✗	School
Experiment 5	Variable 1+3	✓	✗	✓	School
Experiment 6	Variable 2+3	Minimal	✓	✓	School
Experiment 7	Variable 2	Minimal	✓	✗	School
Experiment 8	Variable 3	Minimal	✗	✓	School
Experiment 9	Control 3	✓	✓	✓	School
Experiment 10	Control 4	✓	✓	✓	Adopted
Experiment 11	Variable 1	✓	✗	✗	Adopted
Experiment 12	Variable 1+2	✓	✓	✗	Adopted
Experiment 13	Variable 1+3	✓	✗	✓	Adopted
Experiment 14	Variable 2+3	Minimal	✓	✓	Adopted
Experiment 15	Variable 2	Minimal	✓	✗	Adopted
Experiment 16	Variable 3	Minimal	✗	✓	Adopted
Experiment 17	No Adult + 4	✗	✗	✗	Adopted
Experiment 18	No Adult	✗	✗	✗	School
Experiment 19	Control 5	✓	✓	✓	Adopted
Experiment 20	Control 6	✓	✓	✓	School

IV. THE RESULTS OF THE EXPERIMENT

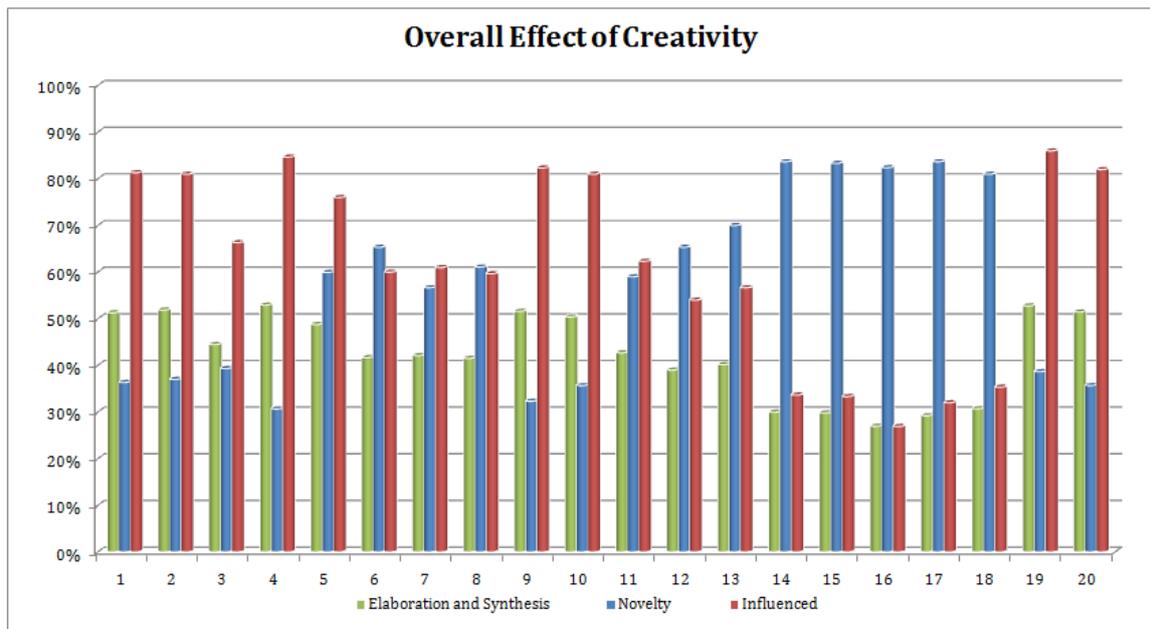
The results of the experiments were derived from the designs produced by children through evaluating their creativity, in particular the three aspects of creativity; elaboration and synthesis, novelty and level of influence. Where children designed under all three variables of instruction engagement and evaluation there was no difference in overall creativity between the adopted and the traditional classroom layouts.

Where instruction was tested alone in the adopted classroom layout there was only a significant increase for the novelty aspect of creativity, however, when instruction was tested with engagement there was a sharp increase in the novelty aspect of creativity. Furthermore, instruction and engagement together resulted in a significant decrease in the influenced dimension for the adopted layout.

Overall there were significant increases in the novelty dimension for the adopted layout and a corresponding decrease in the influenced dimension. The elaboration and synthesis aspect of creativity mostly decreased in the adopted layout.

One of the main findings was that where instruction, engagement and evaluation are tested together the difference in the classroom layout had no effect on all aspects of creativity this was evidence by experiments 1 and 2, 9 and 10 and 19 and 20 (Figure 2).

Figure 2: Overall Effect of Creativity



Source: Researcher's survey

V. CONCLUSION

The various aspects of involvement by a teacher have been shown to have an effect on creativity in children. In this study the layout of the classroom is considered as an additional variable to the influence of the teacher on creativity. This was necessary to further incorporate possible influences on a child when they are being creative in the classroom, because in addition to the teacher and their involvement there was also a need to consider the layout of the classroom. Teachers may be an authority and their actions such as assessment has an influence, but the layout of a classroom can also represent and power structure. The results showed that there was a difference in creativity between the two layouts, however, the adopted layout did not necessarily increase overall creativity, only the novelty aspect of creativity and in fact reduced the other two aspects of creativity. Therefore, it has been shown that different environment affects different aspects of creativity in different ways and that an adopted layout does not necessarily increase creativity. This study has implications for further research into the effects of classroom layout on creativity and the reasons behind the differing effects.

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