

The Potential of Digital Tools in Art Lessons at Junior School Level to Improve Artistic Ability Using Tamazight Fonts

Aber Salem Aboalgasm, Rupert Ward

Abstract—The aim of this research is to explore how pupils in art classes can use creative digital art tools to redesign Tamazight fonts, in order to develop children's artistic creativity, enable them to learn about a new culture, and to help the teacher assess the creativity of pupils in the art class. It can also help students to improve their talents in drawing. The study could relate to research in Libya among the Amazigh people (better known as Berber) and possibly the development of Tamazight fonts with new uses in art. The research involved students aged 9-10 years old working with digital art tools, and was designed to explore the potential of digital technology by discovering suitable tools and techniques to develop children's artistic performance using Tamazight fonts. The project also sought to show the aesthetic aspects of these characters and to stimulate the artistic creativity of these young people.

Keywords—Artistic creativity, Tamazight fonts, Technology acceptance model, Traditional and digital art tools.

I. INTRODUCTION

OVER the past twenty years, many new digital methods of drawing, using various forms of computer software, have become available; these techniques have become increasingly accessible to students, even in primary schools. They include software for filmmaking, animation, illustration, design, drawing and painting. Some common examples of such software are Paint, Tux Paint, Photoshop, Premier and After Effects. More recently, this type of software has been utilized usefully in the typical school classroom, particularly in the art class, where it can enable pupils in the class to easily create new work or reshape old art forms. Tamazight is the language of the Berber people in North Africa, dating from about three thousand years BC [1]. Fortunately, after years of neglect, the Tamazight language and alphabet are now being protected by modern technology as they become the focus of new developments. This project is an example of such developments.

Digital technology has been developed and introduced to the classroom through various devices including iPads, tablets, Kids Pads, and smart boards. These have had an impact on a number of classroom-based activities. While studies have been undertaken showing how such technology has been used, none of these have looked specifically at their effect on creativity or use in developing pupils' artistic ability.

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A number of articles have concentrated on how digital technology helps students to develop their understanding in various school subjects [2]-[4], but there are only a small number of studies on how to motivate pupils to build their artistic creativity and none about using Tamazight fonts within modern technology for artistic purposes.

The fundamental objective of this study is to examine and identify the relationships between art, technology, creativity and motivation in pupils aged 9-10 years, using Tamazight fonts as the basic artistic material. The relationship between art, technology and creativity has only been studied to a limited extent. This researcher has found minimal research that concentrates on this topic with children of junior school age, though there are some studies that relate to older students and many on creativity, art and technology in general. One author has investigated the effectiveness of drawing and interactive dynamics in teaching children [5]. It seems that many researchers take a positive attitude to the use of technology in art. They have examined the viability of tablet computers for children [6], and in 2004, a study suggested that children should be creative partners in a whole design process, using both digital and traditional drawing tools [7]. An attempt was also made to integrate traditional and digital drawing and painting methods by developing a tool called an 'Ant Brush'. The author's subject was whether children learn vocabulary better with the help of pictures or by other means [8]. Digital art technology was used as a tool because of its advantages in terms of flexibility and speed [9]. The participants were 135 third and fourth grade children who read a short English language story presented by computer programmers. For twelve key (previously unknown) words in the story, children received verbal annotations (written translation), visual annotations (picture representing the word), or both. The findings were that they learnt better by words alone [10].

The research for the current project found no studies concentrating on the use of digital tools in art lessons at junior school level that specifically aimed to improve artistic ability using Tamazight fonts. Therefore, this study intends to investigate the creativity of children of different backgrounds in the classroom when given this new subject matter to represent. This may give them the confidence and motivation to improve their artistic ability.

II. TAMAZIGHT FONTS AS ART AND GRAPHIC DESIGN

Graphic designers use various methods to create and combine words, symbols and images to create a visual representation of ideas and messages. Calligraphy is often used in art – both Chinese and Arabic techniques have long traditions. Although the Tamazight language has a history of political suppression, it is now being actively promoted in North Africa and this project is intended to form part of this revival. The old letter forms can be re-used. The shapes of the Tamazight alphabet are all based on natural forms, the greatest of all artistic inspirations and motivators. It is hoped that this artistic potential can be fully exploited in the future.

III. RESEARCH METHODOLOGY

The main questions to be answered in this paper are whether the new idea can motivate students' artistic ability and whether digital tools can enhance this development.

The research project was based on a classroom test with a group of sixteen pupils aged 9-10 in art lessons in West Yorkshire, UK. The project was limited by size, time and setting, though these limits nevertheless allowed an in-depth study. A case study approach was used for gathering data, and grounded theory was used to analyze and assess the data. The case study method is often successful in providing a considerable amount of detailed information [11].

Data was collected from a sample of 16 students, 11 male and 5 female, in an art workshop using digital and traditional drawing tools. The age-range chosen was 9-10 years old; this is an important age in terms of art and creativity, because it is at this age that children can start to understand more abstract ideas. According to research, they also move from passive to active learning and show more complex initiatives [12].

The group of students was tested using both traditional and digital tools. The intention of the selected stimulus was to allow the students to think effectively and use their imagination in redesigning old Tamazight fonts and presenting them in a new form. The students created new forms of design for these characters, using various traditional tools such as pencil, eraser, sharpener, colors, and drawing paper. After they had finished their traditional work, they approached the same idea using digital tools on a computer, with special drawing software to facilitate their work. The teacher provided assistance to the students with their work, whilst an observer made notes about how the children dealt with the technology, and which digital tools they found easy or difficult to use. The kind of benefit the students obtained through the use of digital tools was noted, as well as the motivation behind some tools being used more than others. Was this because of their ease of use, their usefulness, or were there other reasons that motivated the children to work with specific digital tools? It was also noted whether the Tamazight fonts stimulated and motivated the children to produce creative work.

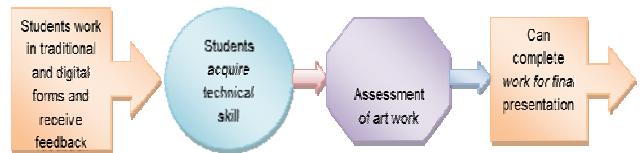


Fig 1 Art framework (process of students' designs using digital & traditional tools)

IV. THEORIES USED IN THIS STUDY

This research has made use of two theories. The Technology Acceptance Model (TAM) theory was used to assess the ease of use and usefulness of digital tools [13], whilst grounded theory was used to analyze and assess the results obtained. Grounded theory can give greater insight into social and interactive situations in areas where there is a shortage of information, such as the use of technology in the art classroom to build creative activity, or the ability to motivate pupils by using new ideas from other cultures, like Tamazight fonts.

The framework for the practical work was based on observation and structured interviews, as well as literature and diverse theories in the fields of pupil motivation, the effectiveness of digital art tools for developing children's artistic ability, and promoting creative activity.

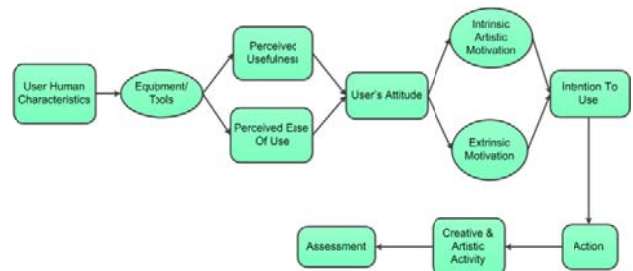


Fig. 2 Modified TAM theory for classroom project

A. Modified TAM Theory

TAM presumes that behavioral intention is formed as a result of conscious decision-making processes. The model specifies three belief factors that are salient in the context of information technology usage and acceptance: perceived usefulness, perceived ease of use, and attitude towards usage [14]. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her performance" [14]. The present research suggests that the child's motivation to create good artwork enhances the desire to use digital drawing tools well, and thus improve their performance. Hence, when a pupil understands how to use the digital tools, and understands which are easy and which difficult to use, the child has grasped the usefulness of these digital tools. Perceived ease of use refers to the degree to which a person believes that using a particular system would be easy or difficult. Perceived usefulness and perceived ease of use can be considered as cognitive factors. Attitude towards usage refers to the "the degree to which an individual evaluates and associates the target system with his or her job" [15]. By the end of the project the pupils were able to evaluate

the tools and even their own progress to some extent. This was done according to criteria given by the teacher.

The original TAM model aims to discover what makes a certain product sellable on the basis of its usefulness and ease of use. It has, therefore, two components: the equipment and the user. When they are brought together, the equipment proves its usefulness or otherwise to the user and the user then develops an attitude to the tools which results in a purchase. Deciding on the best tools was one aim of this project. The human elements of motivation, intention and attitude were taken into account in the modified TAM model of assessment.

B. Grounded Theory

Grounded theory is used for analyzing and assessing data which is collected by a mixed method approach including observation, questionnaire and interview. The main methods of analysis used in grounded theory are coding and memoing.

Coding consists of firstly grouping the data under the main categories of the researcher's preliminary questions. This is done by means of notes and comments (memoing) made by the researcher for his or her own use [11]. As the researcher becomes more familiar with the data, the categories become filled with information and more clearly defined. The grouping of the information can then be made more selective and focused. As a result, the questions that the researcher initially asked can be expanded; this, in turn, leads to yet more in-depth and accurate grouping and understanding of the data, and final core-concepts are defined.

The researcher for this study had a number of preliminary lines of enquiry to follow when planning data collection activities from the case study. These were:

- 1) To discover which tools optimize children's artistic creativity;
- 2) To discover how these tools affect children's motivation and how redesigning and representing ideas motivate students to be creative;
- 3) To find out if the TAM model is useful for assessing the value of the tools.

The observer concentrated on three categories: enhancement of artistic and general creativity; motivation for redesigning and representing new ideas; and assessment of digital tools and how well pupils use them.

A further significant point to explore in this research was to evaluate the factors involved in building a child's artistic creativity. This included, for example, whether environment, background and culture are significant factors.

V. RESEARCH PROJECT ACTIVITY

The researcher started by presenting some ideas for discussion at the beginning of the session. The pupils then supplied some ideas from their own imagination, firstly using traditional tools to realize their ideas. Once they had drawn these on paper, they began working on a computer, using special drawing software to express the same idea again. To start with, some of them knew which of the tools would be suitable and which they would use, whereas others started trying different methods to find out which tools were

appropriate to express their ideas. Others asked their friends to help them.

The observer noted that the school had not previously used digital drawing tools for artistic or creative work. The school used digital art only for teaching other subjects. For this project, the pupils started to explore their talent and creativity for themselves by using digital tools. The observer noted how the pupils changed their approach during the sessions. For example, when the students started work, their thinking was not complex; it was very simple and realistic. Later, their mental processes improved as they learned how to use the digital tools and became more experienced, and thus they changed their thinking from naturalism to a more abstract approach.

This project worked well with children of 9-10 years old. Following observation, the researcher raised further questions directed towards the aims of the research, one of which was how digital drawing tools aid the development of creativity in children by providing opportunities for trying out new ideas, and new ways of thinking and problem solving. The children were then asked to write responses to some questions.

It was observed that at the beginning of the project, 80 % of pupils already knew how to use computer tools and could rearrange, cut, select, replace, delete and multiply. Some of them could use add-on, suggest, represent and juxtapose functions. It was hoped that they would all have some experience and expertise in this by the end of the course but 20% of the pupils were still unable to use all digital tools properly.

Some specific tools helped pupils to be creative, such as the design tools, Stamp and Text, as well as the Colors tool. These appeared to stimulate the pupils to work creatively. About 80% of the pupils used the same tools because they were found to be motivational, notably Magic, Stamp and the designing tools.

VI. SUMMARY OF DATA FROM THE CLASSROOM ACTIVITY

A. Use and Assessment of Digital Tools

In considering the kind of challenges and problems the children faced during the practical work, the observer noted that some of the digital tools presented difficulties for the children. This was especially evident with some specific tools such as Select Picture and Save Picture in the File. About 60% of pupils struggled with Save Picture, Select and Lines. The latter tool appeared to be the hardest of all; about 80% of the students struggled with it, and therefore preferred to ignore it rather than learn how to use it.

In addition, it was noted that 90% found the computer desktop easier to use than digital touch-screen tools such as the iPad, and therefore preferred using the computer to any other device. One common comment was "We cannot make good art using our fingers, the mouse is better". On the other hand, most of the students liked the iPad because it offered more tools than the computer, and allowed them to produce work more easily, quickly, with fewer mistakes and of better quality in terms of colors and brightness.

The observer noted that the students always thought the easiest tools were the most useful, and these motivated them to work most effectively. They always started work with the easiest tools and moved on to the most difficult. 50% found that digital tools offered more facilities than traditional tools, though they missed the big spaces offered by traditional methods. Overall, the pupils enjoyed these sessions. The TAM test of ease of use and usefulness combined with motivation was useful during this observation.

B. Enhancement of Artistic and General Creativity

The children were initially asked to draw by traditional methods to involve them in the project. They then drew the same things using digital software. At the start they had no experience with these tools and no clear idea of what to do, and thus there was good development of their technological skills as well as their artistic ability. By the end of the project, they were almost all using the tools correctly and completing their work using most of the software available. They showed continuity of ideas about Tamazight fonts, a clear idea/message in their work, and definite self-expression by redesigning and adding colors, using light and dark, and experimenting with shadow and shapes.

C. Motivation

They were motivated to use certain tools when they realized that these were appropriate for their purposes. It was possible to observe how different tools motivated them to create more and better artwork, and how the use of material from another culture motivated them to produce creative work. Only two or three pupils were unable to continue or complete work, and had to find alternative ways to achieve their ideas, or even change their subject completely. Most pupils overcame any difficulties and showed great persistence in doing so. Their motivation to overcome difficulties was very strong. There appeared to be general improvement in artistic creativity in the class, shown by the development of more complex ideas, and better and increased use of shape, color and space. They also developed in their ability to complete projects.

D. The Effect of Cultural Factors on Artistic Creativity

It must be remembered that comments on the effects of cultural factors on the children's work will be affected by the subjective opinions of the researcher, despite all efforts to be objective. In addition, this case study was too small for general deductions to be made, and therefore the data gathered can only refer to this particular case study.

The research suggested that cultural factors had a strong influence on ethnic and national ways of thinking. This appeared strongly in the choice of subject matter, artistic approach and the final appearance of the work.



Fig. 3 Tux Paint software used by pupils in the classroom

VII. SUMMARY

This study was designed to explore:

- Enhancement of artistic and general creativity;
- Motivation;
- Assessment of digital tools and how well pupils use them.

Having been asked to draw using traditional methods to involve them in the project, the children then drew the same things with digital software. To begin with, 70% of the sample had no experience with these tools and no clear idea of what to do. During the study, there was clear evidence of development in their technological skills as well as their artistic ability, so that by the end they were almost all using the tools correctly and completing their work using most of the software available. They were motivated to use certain tools when they realized that these were appropriate for their purposes, and it could be observed that different tools motivated them to create more and better artwork. The stimulus of material from another culture also motivated them to produce creative work. Only two or three pupils were unable to continue or complete work, and had to find alternative ways to achieve their ideas, or even change their subject completely. Most pupils solved any difficulties and showed great persistence. There appeared to be a general improvement in artistic creativity in the class, shown by the improvement and development of more complex ideas and better and increased use of shape, color and space, as well as in the ability to complete projects.

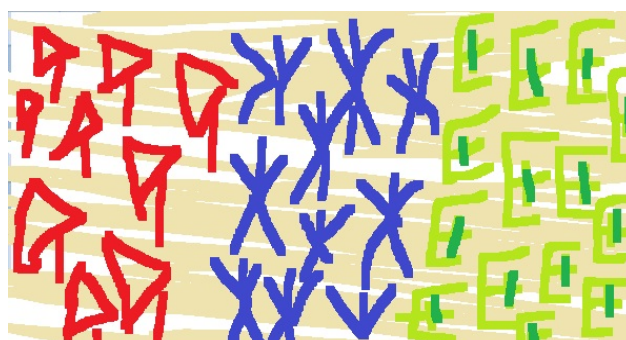


Fig. 4 Pupils' redesigning of Tamazight fonts using digital tools



Fig. 5 Pupils' redesigning of Tamazight fonts using digital tools

VIII. SUGGESTIONS

The present study suggests that TAM theory assists research by means of its ability to evaluate the effectiveness of digital tools. When these tools are supplied and used, the pupils can express themselves in art with added depth and complexity and some unexpected additions, such as originality.

Research suggests that the TAM theory of assessment should work in more than one situation. It might be sufficiently flexible to be adapted for use in evaluating children's responses, in an attempt to combine social aspects with technical elements and thereby assess both the equipment and the children's artistic ability simultaneously.

Two of the most important factors affecting children's artistic creativity seem to be intrinsic artistic motivation, which arises from within the person, and extrinsic motivation, which comes when a child is obliged to do something because of factors external to him or her, such as being offered rewards like good grades or for prizes in a competition. The child's attitude and motivation can be greatly improved by providing tools, by praise and by the stimulation of ideas. Such ideas might include a drawing to complete, an imaginary identity, reviving an old culture or a virtual situation. Possibly the main factor for building a child's artistic creativity is intrinsic motivation, because when children are motivated to produce artwork it either gives them entertainment, or they feel that what they are doing is significant. These emotions give great pleasure, a strong motivation.

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