

# Students' Views on the Use of New Technologies in Art Education: An Interdisciplinary Approach to Higher Education

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## Abstract

The goal of this study was to appoint the students' views on the use of New Technologies in Art education. In this context, a research in the Primary Education Department of University of Aegean was carried out, during the winter semester of year 2010-2011. After having participated in artistic activities which combined traditional art techniques with the use of New Technologies, 82 students took part in the research and answered a questionnaire. The questionnaire was then analyzed with Multidimensional Statistic Data Analysis methods, which allowed for differentiation criteria to emerge as well as for their classification in groups, depending on the students' common answers to the questionnaires. The analysis showed that most students are positive towards using New Technologies in Art education and believe that their introduction in Art classes is possible to be implemented in schools.

**Keywords:** Art, New technologies, Interdisciplinarity

## 1. Introduction

Contemporary education is seeking new teaching methods, which will help it keep up with the challenge of multidimensional social reality, in order to be able to meet the needs of our time and deal with the complex nature of the problems that arise. The interdisciplinary approach is proposed for the counterbalancing of the lack of flexibility of one-dimensional thinking and the dispersion of knowledge. This is an approach which favors an holistic overview of all things, creativity, initiative and imagination (Matsagouras, 2002). The interdisciplinary approach to school knowledge is generally characterized by centralizing and combining knowledge on a particular subject from various disciplines, knowledge which is taught during class and is unified under a common subject (Koffas, 2005).

In an ever transforming and re-defined by contemporary needs era, education has constantly been re-forming and adapting, on a teaching as well as research level (Theofilidis, 1997). Social change, the increasing trend of globalization, the multicultural reality as well as the intense competitive spirit which is spreading in all fields, call for the redefinition of the role of education, having as an ultimate goal the shaping of a strong educational environment which will be able to contribute to the balanced development of the students in real life (Matsagouras, 2003).

## **2. Combining Arts with New technologies in the context of an interdisciplinary approach**

The developments in Technology, especially information technology, are opening up new pathways towards major changes in Art education, in terms of methods as well as necessary facilities (Janda, 2004). The use of personal computers, multimedia, internet and various professional software, encourages students to participate in the teaching process. There are relevant websites online, as well as lesson plans, teaching material, papers and freeware (Karagiannis et. al, 2003).

New Technologies might be used in the case of projects that will combine theory to teaching practice. The students discuss and choose the subject with the aid of contemporary informatics solutions.

The global web offers a variety of tools for the implementation of the teacher's side goals and aims. The students are familiar with the tools, and the projects that are designed are taking place within an ideal educational environment (Konsolas et. al, 2005). The use of up to date and familiar internet tools promotes knowledge and at the same time knowledge is achieved through research. Students learn, find information, express themselves artistically and communicate (Santorineos, 1994).

## **3. Implementation in Higher Education**

The focal point of the present study is the implementation of an interdisciplinary approach among students in the Primary Education Department of Aegean University during the winter semester of 2010-2011. The goal of this research was to appoint the students' views on using New Technologies in Art education. In this context, a teaching intervention was made, in which students actively participated in artistic activities that combined traditional plastic arts techniques (e.g. scale model-building, painting, collage) with the use of New Technologies. The students took photos of their work and processed them digitally using Photoshop software. After the teaching intervention, the students answered a questionnaire so as to explore their views towards the use of New Technologies in Art education. In order to extract the research results, we used statistics software SPSS v.17 and SPAD v.4.5, offered by the Department of Primary Education in the University of the Aegean.

## **4. Students' views on the use of New Technologies in Art lessons**

82 students of the Department of Primary Education participated in the survey. When asked "what did you think of the lesson?", a 13.41% of the participants replied "it was fun", a 23.17% answered "it was interesting", 12.20% found it "innovative" and 51.22% replied "creative".

Before the teaching intervention with the use of New Technologies, 71.95% of the participants already knew how to use Photoshop. The students had also some prior knowledge of Corel (9.76%), Ulead Express (3.66%) and Fotomix (3.66%). 25.61% of the students didn't have any knowledge of photo processing software before this lesson.

After the intervention, 2.44% of the students claimed that they improved their knowledge and skills in IT, 50.00% feel more skilled in art and crafts after this lesson, 39.02% improved in both fields and the remaining 8.54% claimed their knowledge and skills were not in any way improved (Table 1, Figure 1). From the above we conclude that the 91.46% of the students stated that their abilities improved after the intervention.

**Insert Table 1 here**

**Insert Figure 1 here**

Of the students that took part in this survey, 19.51% argued that the use of computers is useful in teaching Art in school, 14.63% feels that the use of computers distorts the originality of the work of art, 54.88% that it is in step with the new pedagogic trends and 10.98% that it restrains the pupils' creativity (Table 2, Figure 2). We can see that the 74.39% of the students has a positive attitude towards the use of computers in teaching Art.

**Insert Table 2 here**

**Insert Figure 2 here**

When asked "which of the following advantages that New Technologies software have to offer, do you think that can also support Art classes?", 30,5% of the students answered "I can add/subtract and multiply/divide elements

from the work of art”, 7,3% thought they could “save my experimental work”, 43,9% answered “I can transform an original work of art endless times” and 18,3% replied “I can reproduce the work of art” (Table 3, Figure 3). So, the majority supports that the conversion and the transformation of the initial work are the most important advantages that the New Technologies can offer to Art.

**Insert Table 3 here**

**Insert Figure 3 here**

To the question “do you think that new technology methods could be implemented in Art education within the school?”, 13.41% of the students that were asked answered “no, due to the lack of facilities”, 42.68% replied “yes, if the teacher has proper training, always in collaboration with the students” and 43.90% answered “yes, if the proper facilities are available” (Table 4, Figure 4). We can see that the 86.59% of the students that participated in the intervention believes that new technology methods could be implemented in Art education within the school.

**Insert Table 4 here**

**Insert Figure 4 here**

28.05% of the participants claimed that the proposals for an urban planning re-modeling can be more realistic when presented with a scale model, 2.44% that the use of Photoshop is more realistic and 69.51% that the combined use of both means is more efficient (Table 5, figure 5).

**Insert Table 5 here**

**Insert Figure 5 here**

48.78% of the students that took part in the survey believes that traditional ways of teaching classes (e.g. scale models, painting) demand more time, 24.39% answered that they demand more technical knowledge, 9.76% that they are more final and don't allow for changes, 14.63% that are difficult to implement and 2.44% that they are difficult to present (Table 6, Figure 6).

**Insert Table 6 here**

**Insert Figure 6 here**

A 23.17% of the participants believe that the use of New Technologies in Art education, helps promote interdisciplinarity, 41.46% that inter-artistic elements are encouraged, 28.05 that the ultimate goal of the lesson is thus achieved, while 7.32% believes that nothing is achieved (Table 7, Figure 7). It is interesting that the students emphasized much more the encouragement of the inter-artistic elements than the interdisciplinarity promotion.

**Insert Table 7 here**

**Insert Figure 7 here**

80.49% of the students declared that the particular teaching intervention is all about using traditional elements and producing new cultural proposals, while 19.51 believes that it is a redefining of Art lessons (Table 8, Figure 8).

**Insert Table 8 here**

**Insert Figure 8 here**

## **5. The results of the Multidimensional Analysis**

We will now present the analysis of the questionnaire that was made using Multidimensional Statistic Data Analysis, which allows for the sketching of the students' differentiation criteria and for their classification into groups according to the common answers they have provided in the total of the questionnaires (Benzécri, 1992). Thus we can examine the result of all the answers interrelation and will see that what plays a major role is not the frequency of the emergence of a characteristic but the combination of many characteristics at the same time, something that leads to the emergence of classification criteria, or a series of typologies. The methods that were used are Multiple Correspondence Factor Analysis, which defines the students' differentiation criteria and Hierarchical Clustering, which leads to the formation of groups/clusters according to common answers and common characteristics among the students that took part in the survey.

### 5.1 Students' Differentiation Criteria

In order to discover which way were the students that participated differentiated depending on all of their answers, we used the Multiple Correspondence analysis method, which is based in the correlation of all the variables at the same time. The results of this analysis set the factorial axes, which at the same time are the students' differentiation criteria. These criteria are expressed as oppositions in their answers, their way of answering and the way their characteristics are recorded. These criteria correspond to the axes of Correspondence Analysis which are presented in order of significance (Athanasiadis, 1995). The elements that differentiate the 82 students that participated in the survey are defined by three criteria of differentiation, the three factor axes that follow.

#### 1<sup>st</sup> differentiation criterion (1<sup>st</sup> factor axis – inertia percentage 12.70%): The use of New Technologies in Art teaching

The first differentiation criterion consists on one hand of students who believe that introducing New Technologies in Art education helps easily reproducing works of art, think that the use of computer technology restrains the children's creativity, had previous knowledge of Photoshop, don't believe that new technology methods can be implemented in Art education in schools due to the lack of appropriate facilities and declared that traditional ways need more technical knowledge. On the other hand, there are students who believe that using computer technology in class is in step with new pedagogical trends and that these methods help achieve the fundamental aim of Art education, declared that introduction of new technology methods can be implemented in Art education in school as long as teachers receive proper training and always in collaboration with the pupils. These students found the lesson innovative and claimed that the implementation of traditional ways (e.g. model-building, painting) is more difficult.

#### 2<sup>nd</sup> differentiation criterion (2<sup>nd</sup> factor axis – inertia percentage 11.20%): The reason for the introduction of New Technologies in class

In the second factor axis, on one hand there seem to be students who don't believe that introducing new technology methods in Art education can be implemented in schools due to the lack of appropriate facilities, while they stated that the use of computer technology is necessary for Art education in school, had no prior knowledge of any image processing software before this teaching intervention and think that traditional ways of Art teaching are difficult to change. On the other hand, however, there are students who think that the class was creative, believe traditional ways of teaching to be more time consuming and that New Technologies are useful for saving their experimental work and claim that pedagogically speaking, this method achieves inter-artistic goals. These students had prior knowledge of Photoshop and thought the lesson was creative.

#### 3<sup>rd</sup> differentiation criterion (3<sup>rd</sup> factor axis – inertia percentage 8.40%): The contribution of artistic activity in the development of skills and abilities of students

In this third criterion, in order of significance, on one hand there are students that found the lesson creative and fun and think that after the artistic activity which combined traditional Art techniques (eg. scale modeling, painting, collage) with New Technologies, their skills and knowledge have been enhanced regarding their arts and crafts abilities. These students believe that traditional ways of teaching are more time consuming and stated that the use of computer technology in Art education promotes interdisciplinarity. However, in this group there are also students who found the lesson interesting but believe that after the teaching intervention their skills and abilities were not in any field enhanced. These students think that the use of computer technology in Art education is in step with the new pedagogical trends and that it promotes inter-artistic education, and they believe that the traditional ways of teaching are difficult to change as well as to present.

### 5.2 Results of the Hierarchical Classification

Looking for a classification of the students' views on the use of New Technologies in Art education we implemented the Ascending Hierarchical Classification. This approach offers the advantage of representing the centers of teams on the factor levels, while at the same time presenting the groups of answers to the initial questions, aiming to a more complete interpretation of the differences between the groups. The Hierarchical Clustering led to the formation of four groups of students, which are disposed according to Figure 9. Next to each group you see the number and the percentage of the students that constitute it.

#### **Insert Figure 9 here**

#### 1<sup>st</sup> group (7 students, 8.54% of the sample):

The students of the first group think the lesson is interesting but believe that after the teaching intervention their skills and knowledge was not in any way improved. They believe that traditional ways of teaching (e.g. model building, painting) do not permit change.

2<sup>nd</sup> group (43 students, 52.44% of the sample):

Students of the second group know how to use Photoshop before the teaching intervention, believe traditional ways of teaching to be more time consuming, find the lesson creative and think that the use of New Technologies in Art teaching promotes interdisciplinarity.

3<sup>rd</sup> group (9 students, 11.98% of the sample):

The third group consists of students who believe that New Technologies are useful for reproducing the work, stated that traditional ways of teaching demand more technical knowledge and think that introduction of new technology methods in Art education cannot be implemented in schools due to the lack of appropriate facilities.

4<sup>th</sup> group (23 students, 28.05% of the sample):

Students of the fourth group believe that with the use of New Technologies in Art teaching the essential goal of the module is achieved, have no prior knowledge of image processing software before the teaching intervention, find the lesson innovative and think that traditional ways of teaching are difficult to implement.

The students of the fourth group differ from the others because they don't believe that New Technologies can be used in Art teaching. Also, the students of the second group differ from the rest because their attitudes towards New Technologies are significantly positive. These differences are presented graphically in Figure 10 in which the graph of the Correspondence Analysis is presented. In the graph the position of centers of gravity of the four groups highlight the differences and the similarities among the students of every group.

**Insert Figure 10 here**

## 6. Conclusions

The goal of this study was to appoint the students' views on the use of New Technologies in Art education using modern teaching methods. The analysis showcased that the majority of the students is positive towards the use of New Technologies in Art education and believes that introduction of new technology methods in Art education can be implemented in schools. The use of image processing software (such as Photoshop and Corel), freeware such as PhotoMix, as well as websites, like Picnik, for example, have opened up ways for important changes in the teaching of Arts and adds a new interest to the research regarding New Technologies in Art education. (Hill & Hannafin, 2001). Also, students can use internet tools like Webpage "piknik" where they can process online their photos. New applications, their acceptance by the academic community, the teachers' proper training, the students preparation through Pedagogical Institutes, the efficiency of new methods in teaching practice, technical and functional issues that might occur, as well as many other elements, are a major challenge for the researchers who would like to continue this study and reach further than its results in regard to the use of New Technologies in Art Teaching (Athanasiadis & Stefos, 2006).

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Table 1. After the artistic activity, you think your skills and abilities have improved in...

|                        | N  | %       |
|------------------------|----|---------|
| Computer technology    | 2  | 2.44%   |
| Arts and crafts skills | 41 | 50.00%  |
| Both                   | 32 | 39.02%  |
| None                   | 7  | 8.54%   |
| Total                  | 82 | 100.00% |

Table 2. Do you believe that the use of computers...

|  | N  | %       |
|--|----|---------|
| Is useful for teaching art in school     | 16 | 19.51%  |
| Distorts the artistic work's originality | 12 | 14.63%  |
| Is in step with new pedagogical trends   | 45 | 54.88%  |
| Restraints the pupils' creativity        | 9  | 10.98%  |
| Total                                    | 82 | 100.00% |

Table 3. Which of the following advantages that new technology software has to offer do you think that help art education?

|  | n  | %       |
|--|----|---------|
| I can add/subtract and multiply/divide elements        | 25 | 30.49%  |
| I can save my experimental work                        | 6  | 7.32%   |
| I can transform an initial work of art countless times | 36 | 43.90%  |
| I can reproduce the work of art                        | 15 | 18.29%  |
| Total  | 82 | 100.00% |

Table 4. Do you think that new technology methods could be implemented in Art education in schools?

|   | n  | %       |
|---|----|---------|
| No, due to the lack of facilities   | 11 | 13.41%  |
| Yes, if the teacher has the appropriate training, always in collaboration with the students | 35 | 42.68%  |
| Yes, if the appropriate facilities exist  | 36 | 43.90%  |
| Total   | 82 | 100.00% |

Table 5. Do you believe that the proposals for an urban planning re-modeling are more realistic when presented...

|  | n  | %       |
|--|----|---------|
| By model-building                      | 23 | 28.05%  |
| Using Photoshop                        | 2  | 2.44%   |
| Combining Photoshop and model-building | 57 | 69.51%  |
| Total                                  | 82 | 100.00% |

Table 6. Traditional ways of teaching (eg. scale model-building, painting)...

|                                 | n  | %       |
|---------------------------------|----|---------|
| Demand more time                | 40 | 48.78%  |
| Demand more technical knowledge | 20 | 24.39%  |
| Don't allow for changes         | 8  | 9.76%   |
| Are difficult to implement      | 12 | 14.63%  |
| Are difficult to present        | 2  | 2.44%   |
| Total                           | 82 | 100.00% |

Table 7. Do you think that this way, pedagogically, one can achieve...

|                                     | n  | %       |
|-------------------------------------|----|---------|
| Interdisciplinarity                 | 19 | 23.17%  |
| Inter-artistic elements             | 34 | 41.46%  |
| The essential role of art education | 23 | 28.05%  |
| Nothing                             | 6  | 7.32%   |
| Total                               | 82 | 100.00% |

Table 8. We can thus speak of...

|   | n  | %       |
|---|----|---------|
| A re-defining of art teaching   | 16 | 19.51%  |
| Use of traditional elements as well as production of new cultural suggestions | 66 | 80.49%  |
| Total   | 82 | 100.00% |

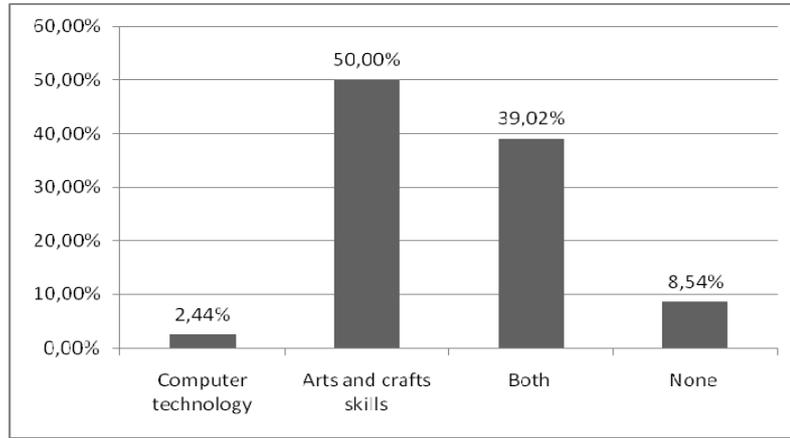


Figure 1. After the artistic activity, you think your skills and abilities have improved in...

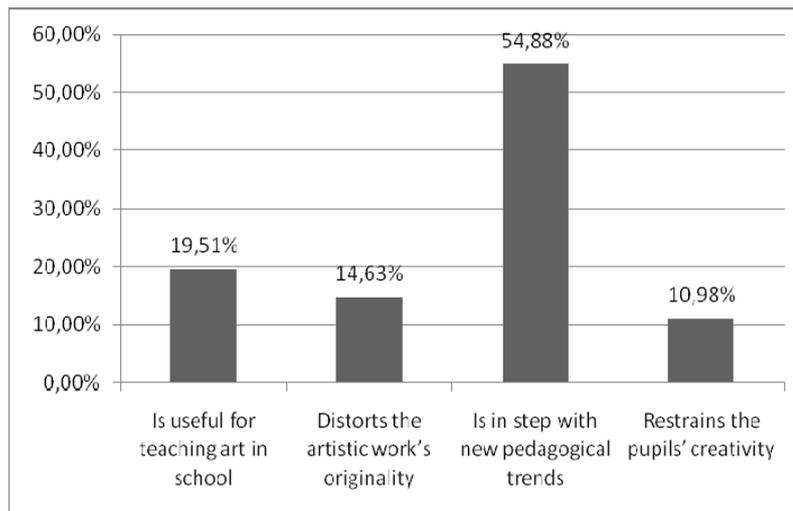


Figure 2. Do you think that the use of computer technology...

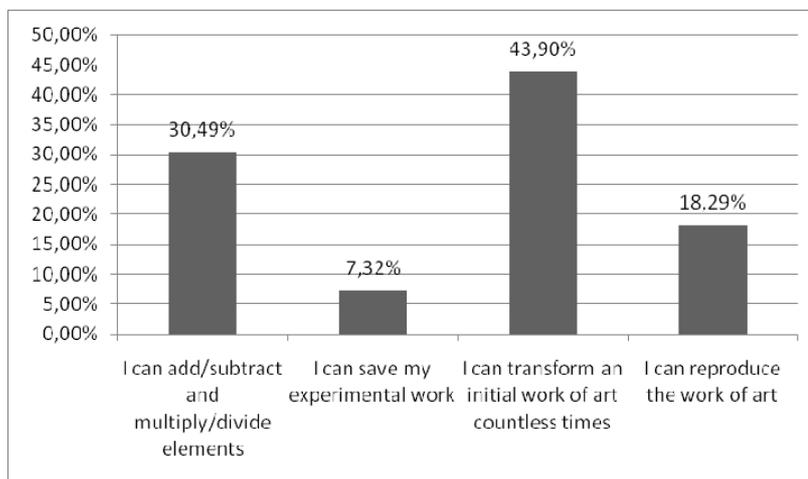


Figure 3. Which of the following advantages that new technology software has to offer do you think that help art education

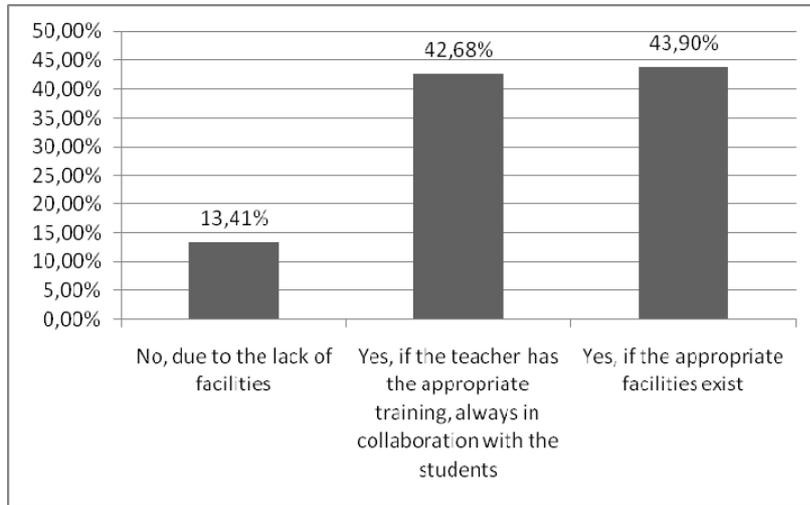


Figure 4. Do you think that new technology methods could be implemented in Art education within the school?

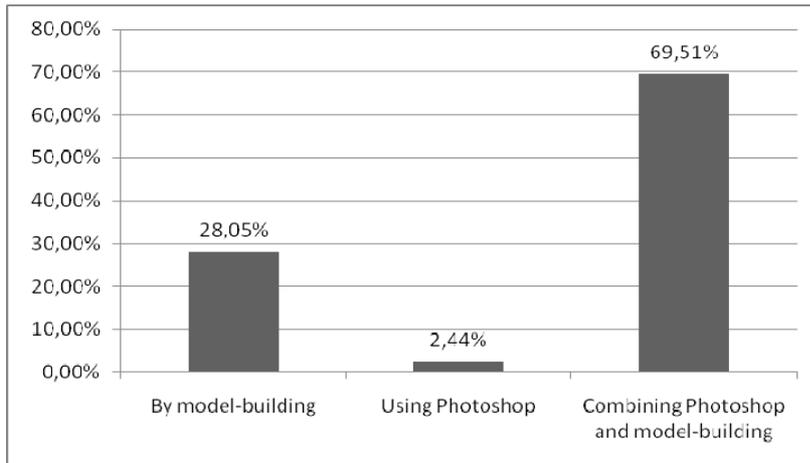


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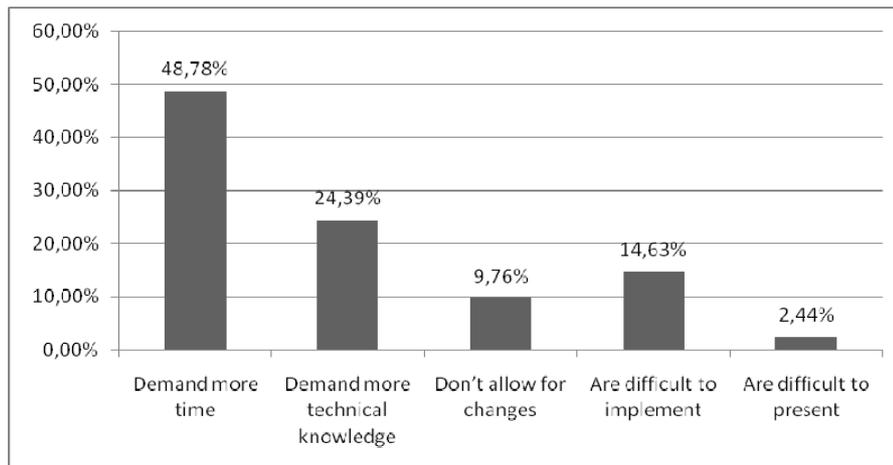


Figure 6. Traditional ways of teaching (e.g. scale model-building, painting)...

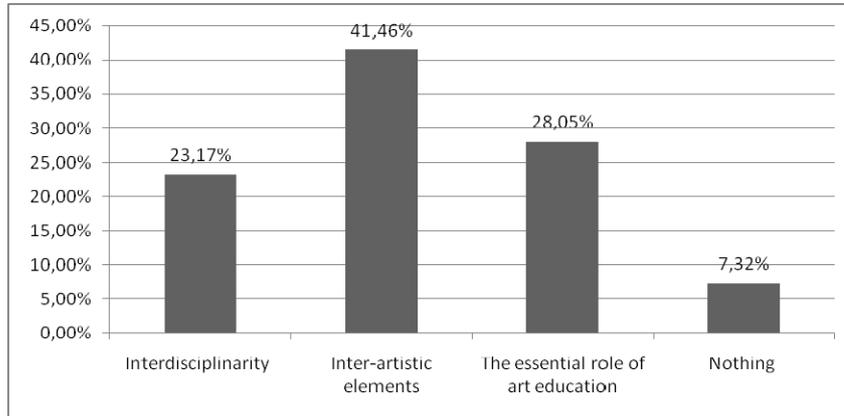


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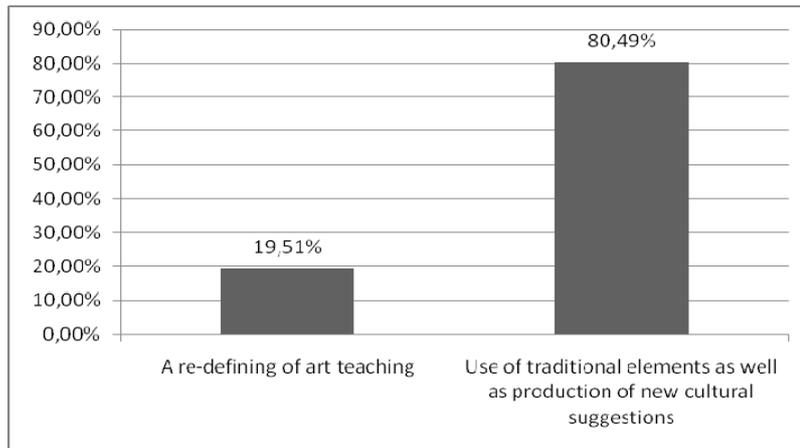


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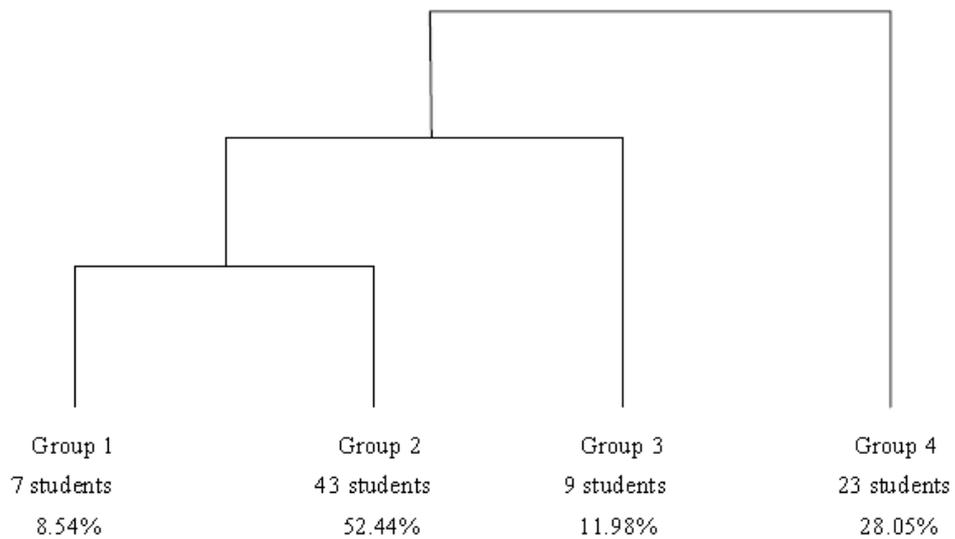


Figure 9. The Classification Chart

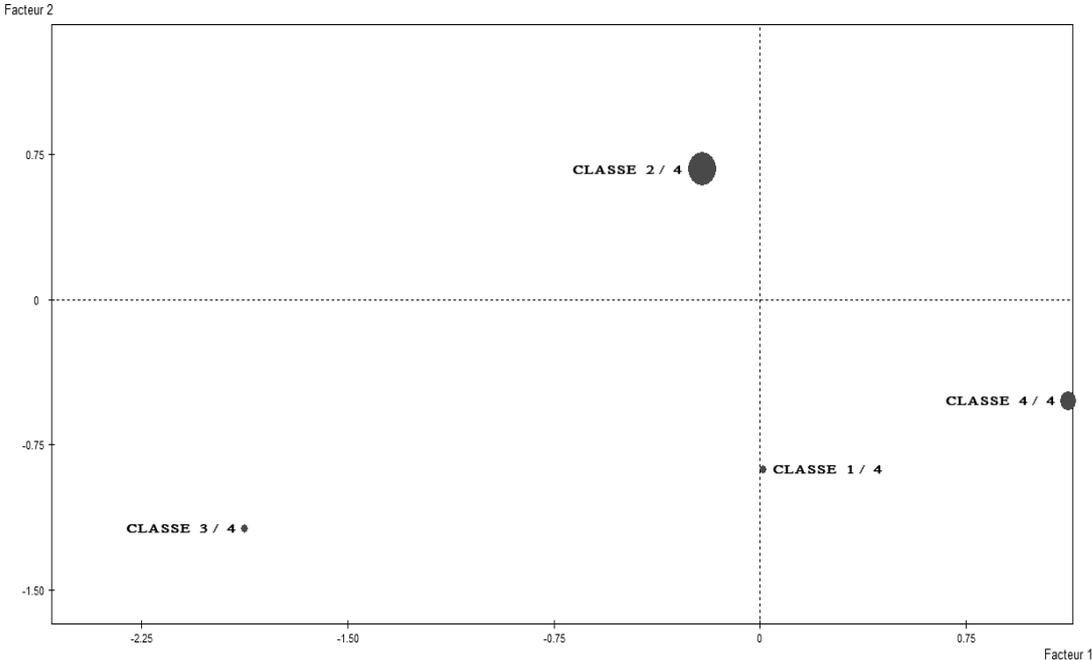


Figure 10. Correspondence Analysis