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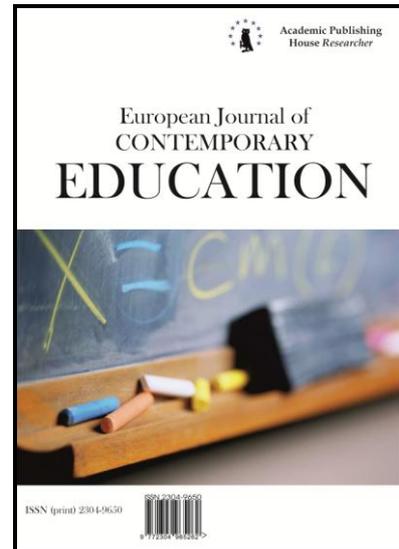
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Contribution to the Improvement of Class Teaching of Life and Earth Sciences Through the use of Audio-Visual Materials at Pylone High School (Benin)

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Abstract

This study showed that documents used for learning at high school are made up texts and images and those documents in contrast to audio-video materials did not stimulate the students.

Keywords: audio-visual materials; class teaching; Sankorè program; life sciences; Pylône.

Introduction

Education is the bedrock for Sustainable Development and Human Capacity Building because it is through education that all the skills such as analytical thinking, logical thinking, and critical thinking skills are built to serve sustainable development. Thus this investigation to improve education offer fits very well in the present conference.

The audio-visual media are a part of these indisputable realities and for students they represent a major reference because they belong to one of the most consuming categories of individuals of this technology. However schools do not seem to realize the importance of the development of the audio-visual media and their influence on the learning population. We don't

realize the fact that, in current conditions, the use of image in school and media consumption could create new resources essential to the educational socio-cultural environment favorable for learning.

Still the excellence in education requires the integration of diverse technologies and techniques suited for teaching and learning sciences.

Nowadays, the role of audio-visual materials in education is at the core of profound reflection on behalf of scientists (ACSP). The practice shows that it is the language teachers who seem to be quite active nowadays. Moreover, educational researches on the use of broadcasting in the science of language and communication (semiology and pragmatics) has known its full development [Chalon and Rubenach, 1976]; [Gauthier, 1982] and ended up with fantastic results.

However, in the scientific disciplines such as life and earth sciences and others, data on this particular subject are not abundant.

In Benin where the school results in particular those of the past years make proof of a mediocrity regarding the quality of the educational offer, it is more than necessary to put an end to the dullness in the pedagogic action based almost exclusively on the exploitation of documentary supports which no more arouse either the enthusiasm, or the excitement of learners in the active construction of knowledge. This happens in spite of the availability of audio-visual equipment in many high schools. The problem arises in terms of educational innovation by reconciling the image and the sound omnipresent in the daily environment of students and pedagogy in order to improve the performances of teachers and raise the level of learners by re-evaluating their efficiency.

That is why it seems very relevant and even innovating to work on the possible use of broadcasting as teaching materials in life and earth sciences. Thus this study aims at contributing to the improvement of class practices in life and earth sciences by estimating the impact of the use of the audio-visual media on the construction of the knowledge and its assimilation by learners.

Study area, material and method

1 Localisation of Agla

Agla is one of the six neighborhoods of the 13th district of Cotonou. It lies between parallels $6^{\circ} 22'$ and $6^{\circ} 23'$ north latitude and meridians $2^{\circ} 21'$ and $2^{\circ} 23'$ east longitude. [Iwikotan, 2011]



Figure 1: Geographical situation of the study area (Source: Iwikotan 2012).

Cotonou is always confronted with the problems of flood which turn it into a water city [N'bessa, 1997], and [Adamou, 2003].



Figure 2: State of the study area during wet season

Pylons high school which opened its doors on October 18th, 1993 with a staff of five (05) professors, (1) director and three hundred eleven (311) students distributed in four educational groups accounted in 2012, 3970 students and 278 teaching personnel.

Material and Method

The methodological approach adopted within the framework of this study consisted in desk study, collection and processing of data, analysis and interpretation of the results.

Through the desk study, we could come across some data on the use of audio-visual media. The synthesis of this available data helped us make the current inventory on the theme such as: conception of audio-visual material, its methods of use, advantages and disadvantages of audio-visual materials. As for the sampling, the size of the sample is determined according to the formula [Gado, 2000].

$$N_s = \frac{(N_p)(p)(1-p)}{(N_p-1)(B/C)^2 + p(1-p)}$$

N_s = the complete required size of the necessary sample needed to obtain a desired level of precision; N_p = the size of the population; P = proportion of the population planned to choose one of the two categories of answers; B = acceptable level of sampling error ($\pm 5\%$ in our case); $C = Z$ Statistics associated with the level of confidence (1.96 corresponds to 95 %)

Application: with $N_p = 3970$; $B = 5\%$; $C = 1.96$; the size required by the necessary sample needed to obtain a desired level of precision is of 350 pupils. For the requirements of the statistical analyses a total of 350 pupils were chosen. The pupils were selected following a stratified random sampling method to satisfy the requirements of the representativeness of the population within our sample. Each of the classes of both levels (1st and 2nd cycles) and of all from the sixth grades to final years of the high school were represented. At the level of every class, four pupils among whom two boys and two girls were selected at random and were given a questionnaire. The total being equal to 335 pupils, 15 additional pupils were added at random, in order to reach the 350 pupils required for the present study. As regards to the professors of Life and Earth Sciences, a total number of 30 professors were selected at random for the questionnaire. In respect of the authorities, the head teacher who was in charge of the academic activities was automatically chosen. The different data collected during the survey was statistically analyzed by means of Statistical Package for Social Sciences (version 17). The analysis concerned variables established for the present study. Graph-pad software version 5 was used to plot graphs.

Results and discussion

1. Results

1.1. Results stemming from the questionnaire administered to students.

The answers obtained at the end of the questionnaire given to students are presented in tables and of figures.

1- Have you ever attended a lecture with audio-visual materials?

Table I: distribution of the investigated individuals according to their participation to a lecture using audio-visual material

Question 1	Yes	No
Size (350)	0	350
Percentage	0 %	100%

2-How is the communication between the teacher and you during the learning process?

Table II: distribution of the investigated individuals according to their assessment of the quality of communication

Question 2	Yes	No
His voice is strong enough	285	65
His vocabulary is adapted	285	65
He speaks clearly and lively	313	37
He makes gestures while explaining	258	92
All in all a good communication	285 or 81%	65 or 19%

3-How is the relational atmosphere between the teacher and you?

Table III: distribution of the investigated individuals according to their assessment of the quality of the relational climate

Question 3	Yes	No
Openness to dialogues	257	93
Easy to approach	250	100
All in all a good relational atmosphere	253 or 72%	97 or 28%

Question 4: How do you acquire knowledge during the learning process?

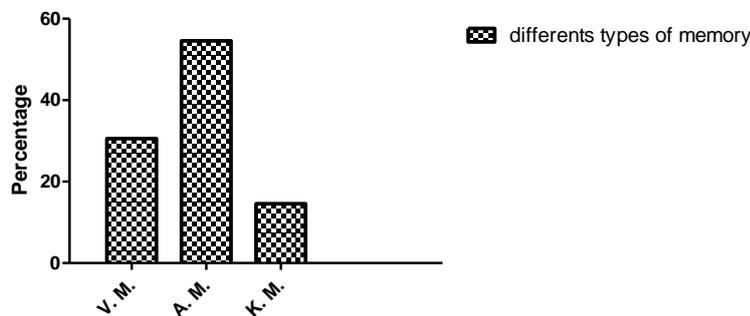
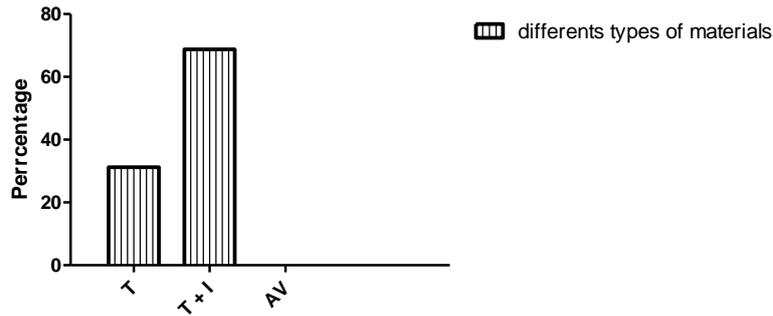


Figure 3: The various types of memory among learners

V.M.: Visual memory; A.M.: Auditive memory; K. M.: Kinesthesic memory

Question 5 - What are the types of materials that the teacher uses in class?



T : Texts ; T+I : Texts + Images ; AV : audiovisual

Figure 4: the various types of didactic materials used during the teaching / learning / evaluation process

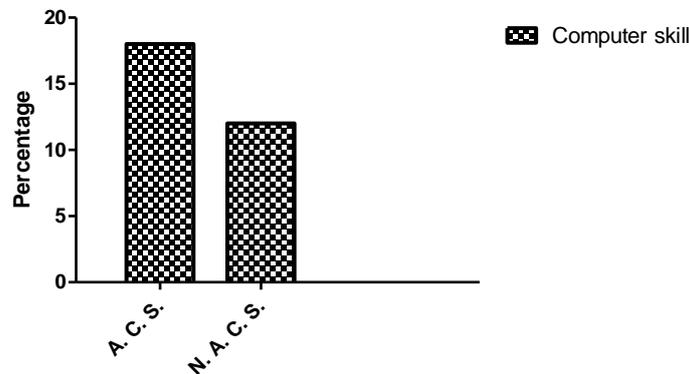
Question 6: Would you be happy if the teacher proposed you audio-visual materials?

Table IV: distribution of the investigated individuals according to their desire of participation in a lecture with audio-visual materials

Question 6	Yes	No
Size	348	2
Percentages	99.42 %	0.57 %

1.2 Results of survey with teachers

Question 1- Do you have computer skills?



A.C.S.: Acquisition of computer skill; N.A.C.S.: Non acquisition of computer skill

Figure 4: Percentage of teachers with computer skills and those without computer skills

2-Which types of materials do you use in class?

Table V: distribution of the investigated individuals according to the materials used

Question 2	Text	Text+image	Audio-visual
Size (30)	0	30	0
Percentages	0 %	100 %	0 %

Are you aware of the Sankorè program for digital education?

Table VI: distribution of the investigated individuals according to their awareness of Sankorè program

Question	Yes	No
Size (30)	0	30
Percentages	0%	100 %

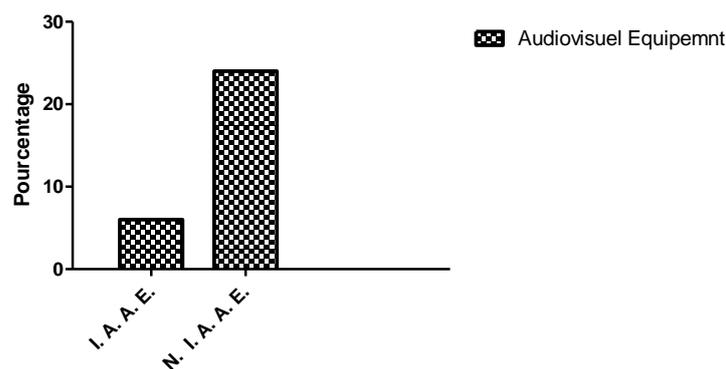


Figure 5: percentage of the informed and not informed teachers with regard to the installation of the audiovisual equipment in school

I.A.A.E: Informed about audiovisual equipment; N.I.A.A.E: Not informed about audiovisual equipment.

Would you be interested to use the audio-visual materials during the process teaching / learning / evaluation of Sankorè?

Table VII: distribution of the investigated individuals according to their desire to use audio-visual materials during the process teaching) / learning / evaluation of Sankorè

Question	Yes	No
Size (30)	30	0
Percentages	100 %	0%

1.3 Results of the interview with the authorities of Pylons high school

The interview realized with the authorities of the Pylon CEG particularly with the head teacher who is the person in charge of academic activities revealed that the authorities had no knowledge of the Sankorè programme for digital education. Moreover, none of the authorities knew how to use the audiovisual equipment installed in the school. So it is useful to indicate that the authorities carried out no action with the aim of appropriation and use of the audiovisual equipment. However they supported that they will be very delighted to know that the teachers use audio-visual materials during teaching / learning process.

2 Discussion

2.1 Discussion with regard to the answers of learners

Regarding the question no.1, 350 learners on 350, that is 100 % of learners assert never having had the opportunity of a lecture with audio-visual material. It seems clearly that the learners never had the opportunity to undergo a teaching / learning process based on the use of the audio-visual material.

But what are the types of materials that teachers use?

The answer to this question is given by the opinions recorded from the learners.

Actually, regarding question no 2 relative to the types of materials used during teaching / learning process, 118 learners out of 350 claimed that the used supports are only texts whereas 332 recognize that supports are made of texts and images.

This educational approach totally based on the exploitation of text and image ends up in dullness. The use of audio-visual materials is part of a diversification of the educational methods. Actually, according to SCLO (socio-cognitive learning through observation), the fact of changing materials exercises a stimulating effect because it breaks with the habit of working on written supports. So, it could re-motivate the pupils. Besides, [Beitone et al., 2004] proved that the use of audio-visual medium can also allow teachers to make pupils work without the latter being really aware of it. The

pupils will learn or at least will illustrate phenomena learnt without having had the impression of supplying an effort. This is due to the fact that the television is part of their daily environment, of their pastime.

However, what are the difficulties caused by the materials learners are used to?

As for question no.3 regarding the quality of communication, 285 that is 81 % of learners admitted that the communication with the life science teachers is of good quality against 65 learners or 19 % which qualify the communication of mediocre quality.

With regard to question no.4 connected to the relational atmosphere between learners and life science teachers, 253 (72 %) of learners admitted that the relational atmosphere with their teacher is favorable against 97 (28 %) who support the opposite.

Although problems of communication and the relational climate between learners and teachers do not arise seriously, they exist all the same and solving them would doubtlessly improve the quality of the educational offer.

For that purpose, many authors report that a possible use of audiovisual materials can mitigate these problems. Indeed, the more or less clear information passed on by the message is affected when the latter is received by the learner. For the authors, the use of audio-visual materials is a panacea for solving all the aforementioned problems that damage the communication and the relational atmosphere between teachers and learners.

In fact, an audio-visual material can improve the parameters that determine the voice, the codes and gestures as far as the video does not occur live. It is supposed that the voices, the codes and the gestures would be better practiced by the participants; moreover the teacher could increase or decrease the sound volume because he could realize what the class hears as a whole. It is from this report and from this model that the question of the diversification of the teaching materials arises. This use would have the advantage of placing the transmitter (the teacher) and the receiver (the pupil) in a more important closeness. The teacher can observe more easily the reactions of his pupils, realize if they understand what is developed, stimulate their attention, and guide them towards what they are supposed to listen.

The audiovisual materials can facilitate the communication because the teacher can clarify as one goes along the "codes" contained in the message transmitted. It is the same thing for the body movements. Indeed, it releases the teacher of his body movements and allows him to study that of the receivers as well as to interpret better some of their visible reactions. This passage demonstrates that the use of audio-visual materials allows reducing the difficulties of communication.

In respect of question no.5 related to the various types of memory, it was recorded that 107 learners, i.e. 31 % were visual-memory dominant, 191 (55 %) were auditory- memory dominant whereas 51 (14 %) learners only were of kinesthetic-memory dominant. From the answers to this question, it appears that more than 85 % of the learners had a dominant audio-visual memory. According to scientists [Bourrissoux and Pelpel, 1995], the use of audio-visual materials in class could allow the pupils to use other means of memorization than those used during a classic type of lecture. Indeed, the fact of using a hearing and visual material at the same time could favor the learning in pupils because it allows them to mobilize their various types of memory and thus improve their learning ability.

Besides these advantages mentioned concerning the audiovisual materials, the same authors demonstrated that it allows one to educate, to inform, to explain by showing. It also allows one to strike the imagination, to cause an emotional shock, to inspire fear, respect or admiration [Sensevy, 2007].

This is the emotional side of audiovisual materials and it is about persuading, convincing, and supporting. So it is clear that "The audio-visual materials allow learners to use various types of memory" and "The audio-visual materials favor a diversified acquisition of knowledge".

But, do learners perceive these benefits of audiovisuals?

The favorable and spontaneous desire to support the initiative from almost all of learners (348/350) to the use of audio-visuals during the process strongly shows their perception of the

benefit the audio-visuals in class present. This comes to illustrate the fact that the audio-visuals could stimulate the enthusiasm and the infatuation of learners during classes.

But what are obstacles which could hinder the insertion of audio-visuals in pedagogy?

2.2 Discussion with regard to the answers of teachers and authorities

Thirty teachers on 30 have never used the audio-visuals. So the use of audio-visual materials requires teachers to be trained to the current technologies. Yet inquiries revealed that at least 12 teachers on 30 have no IT skills. This can represent an obstacle in the fulfillment of our educational innovation. So, in spite of the opportunity of Sankorè program for a digital education in Benin, being facilitated by the Beninese authorities and the international partners, this program remains highly unknown to the main actors of the education system. Actually, 30 teachers out of 30, that is 100 % of the teachers assert having never been informed about such a program. Moreover, an audio-visual equipment of Sankore project was installed inside the high school and 24 teachers out of 30 were never informed of it. However, it is very comforting to notice the willingness of the teachers to use of audio-visual materials in class because 30 teachers on 30, that is 100 % assert being favorable to such an innovation.

In respect of the authorities, it is necessary to admit that the use of audio-visuals would not be achieved without ordeals as far as these authorities which have to promote this exceptional educational innovation assert knowing nothing about Sankorè programme and also they don't know how to use the audiovisual equipment installed by Sankorè programme. Moreover, no action was taken by the authorities for wide information of the installation of the audiovisual equipment. Is the audiovisual pedagogy without drawbacks?

As every flow has its ebb, the use of audio-visuals in class can raise inadequacies. So, for some authors, the broadcasting can represent a distracter of learning and - by an overload of information - it can produce an effect against that expected. For example when what must be learnt is in a redundant way in the image and in the text, when the information contained in the text and the image are of the same nature, when the task of learning is based on the memorization rather than on the more complex cognitive activities such as the understanding or still when figures are presented to pupils of average capacity or over the average.

However, except for a few drawbacks that could be reported, the use of audiovisual materials is requested for the reasons we all claim to believe in: it possesses a psychological function of motivation and an important power of persuasion, it allows one to display phenomena that are imperceptible under normal conditions of perception, it guarantees a better memorization, it facilitates learning because the proverb " a good image is better than a long speech " would apply, of course, to all audio-visuals. But there is another reason for interest of educators towards broadcasting: its vicarious role. Indeed, the school which often teaches only by being excluded from the world, allows however the world to enter its classes, under the form of images. This is also the basic myth of television, this 'window opened to the world' that projects each household, family and individual in the middle of events and history. However, the experience showed that the technological progress in this particular case the implementation of a type of pedagogy centered on the use of audio-visuals worth nothing if we do not make an efficient use of it.

Conclusion

The present study allowed us to contribute to the improvement of class practices by the proposal to use audio-visual materials. The results of our investigation revealed that this very promising educational approach is non-existent in our study area, Pylons high school. The class practices still remain exclusively based on the exploitation of texts and images. This pedagogy is dulled and presents some difficulties such as issues of communication, the relational atmosphere between teachers and learners which is not very favorable and the low assimilation of the learners connected to the fact that in most of the cases the materials do not allow them to exploit the different types of memory they are naturally provided with. Besides, the teachers, the authorities and the learners ignore the Sankorè project for a digital education. Moreover, the audiovisual equipment installed by the project is little known. For an effective implementation of a pedagogy centered on audio-visuals, concrete actions such as wide information of the Sankorè project, computing technologies and broadcasting trainings are essential.

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