

APPLICATION OF MULTIMEDIA PRINCIPLES: POST GRADUATE STUDENTS' EXPERIENCE.

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ABSTRACT: *This study was an empirical survey that used the survey design on a random sample of 120 (one hundred and twenty) doctoral students of the University of Port Harcourt, from two given sessions. The instrument consisted of a 31-item Multimedia questionnaire divided into seven (7) sections. This instrument met the indices of both content validity and reliability. Some of the findings of the study were: texts still dominate most PowerPoint presentations; there is obvious difficulty in labeling complex graphics as such lines could intersect; occasional non reference to projected slides perhaps due to time factor, reading from slides in some cases; and the formal rather than conversational style of presentation, amongst other. The recommendations made were strictly tied to these major findings.*

KEYWORDS: Contiguity, Modality, Redundancy, Coherence, Segmenting, And Personalization

INTRODUCTION

Background of study

PowerPoint presentation has gained universal attention in today's contemporary learning environment, courtesy the presence of digital devices and tools in our schools. The presence of a computer, multimedia projector, a screen, power source, and perhaps a public address system, a factor that is influenced by size of audience, offer a conducive atmosphere for the integration of this application in a presentation. This is the underpinning reason why presentations are shifting from the conventional practice where ICTs were rarely integrated to this reality today while acknowledging the potentials they offer in enriching our presentations.

In lectures, seminars and conferences, the relevance of PowerPoint presentation is noticeable. However, the richness of such presentation in the integration of texts, graphics in a combined fashion is more ideal than just either of them. This is the major crux of the discourse. Mayer (2001), a pioneer and major proponent of this integration approach of texts and graphics, in the book on multimedia learning, corroborates its unbendable relevance in teaching and learning.

At the Post Graduate level, Masters and Doctor of philosophy students are encouraged to do their presentation using the PowerPoint application. While the aim is geared towards acquainting them with best international practices to be able to function effectively in any local or international forum, the students practice the development and utilization of slides in order to achieve a brief and concise presentation. In no small measure, this approach also helps in instilling the concept of time management in presentation, whether in lectures, seminars or conferences. Therefore, the extent to which these post graduate students involve

simple presentation hints or guides in their design of frames is eminent especially where the focus should be the rightful interplay of texts, graphics and audio (presenter's voice).

REVIEW OF LITERATURE

PowerPoint presentation is a communication technique that uses the software application and its inherent features to achieve a good presentation in terms of quality prose and graphics, and in the right manner. The reasoning is that it is not enough to choose number of frames, using texts, graphics or both without being guided by some basic guidelines (Roblyer & Doering 2014). The authors contend that a PowerPoint presentation should be guided by what they called presentation software design and guideline. These include; the use of large type, contrasting the text and background colours, minimizing the amount of texts in each frame, keeping frames simple and avoiding using too many fancy fonts. Other guidelines include; avoidance of the use of gratuitous graphics and clip art, extraneous sounds, using of graphics and texts not just either, avoidance in the reading from slide and ensuring presentation is done in a dark room where lighting system is turned-off or tinted blinds. From the foregoing, it is certain that a user's literacy or fluency in this application can be adequately rewarded where frames designs are governed by such basic hints as recommended by the multimedia approach based on the under listed principles.

Multimedia principle is a presentation with on-screen texts or slides with texts and graphics and not either only. In other words, multimedia principle sues for design of relevant slides that contain both texts and graphic together rather than either. Clark and Mayer (2008) would maintain that in the former, that no connection is established due to absence of either element but present when both are present. There is a close affinity between this observation with that made about seventeen years earlier by Resnick (1991) whose view of cognitive theory meant that effective instructional material facilitate learning by directing cognitive resources toward activities that are relevant to learning rather than toward preliminaries to lesson. Tests without graphics for instance are ineffective as learners will unnecessarily be required to mentally integrate disparate sources mutually exclusive as no connection or linking bridge is seen to have occurred. The study on how a bicycle pump works with texts versus texts and graphics, learners gained less in the former but more in the latter approach (Mayer, 2009).

Contiguity principle recommends keeping texts very close to its corresponding graphics as essential if the desired connection must be sustained. Where this is not the case, disconnection ensues which invariably hampers comprehension. Our graphics therefore should be properly labeled without intersecting arrows or lines, tables and figures and appendages, appropriately titled, if the required meaning must be achieved. The study on the effect of presenting printed works near corresponding graphics by Mayer (2001) lends credence to this principle. In the study, result has it that learners performed better when screens from lightning lesson integrated texts and graphics (integrated) presentation than the contrary (separated) integration. The same evidence manifested in the studies by Chandler and Sweller (1991) with training programmes for technical tasks and the thirty-seven studies review by Ginns (2005), having contiguity with a mean effect of .72.

Modality principle on the other hand maintains that people learn better when texts are presented as narration rather than from words alone. This informs us never to project any slide that we are not going to refer to. When we view texts-on-screen or graphics but without

accompanying audio, only then can we appreciate the strength of modality principle in our presentation. Therefore, never provide a scenario where only texts will be referred to by an audience without audio though not exact narration. When this is not the case, the meaning is that while the visual processing channel is activated, the audio component is rendered inactivated, short audio learner for instance. On the evidence of using spoken rather than printed text, screen from lightning lesson explained with audio narration versus that with on-screen text, better learning occurred with the former approach than the latter (Moreno & Mayer, 1999), just as similar result showed in the study on responses to question in audio narration versus in on-screen text on the working principles of an electric motor (Mayer, Dow & Mayer, 2003).

Redundancy principle in the view of Arshavskiy (2013), in the 6th chapter where six principles of effective e-learning of Clark and Mayer (2008) were summarized, has it that we should not have both on-screen text and audio added to a multimedia presentation. So on no condition should tests be read or duplicated as they appear on the frames or else the audio narration renders the texts redundant. This is corroborated by the result of a quasi-experimental study consisting of redundant group and non redundant group on the formation of lightning. The result has it that the latter group of students, that is the non-redundant group produced more solutions on a problem-solving transfer text than the redundant group (Mayer, Heiser, & Lonn, 2001)

Coherence principle recommends the non inclusion of extraneous, intrusive and foreign texts or graphics or audio and that they should be avoided as much as possible either in the frames or during presentation proper. A bad mannerism during presentation could serve as an extraneous audio if not properly checked, so there is the need to be conscious where one is associated with other. Also, let slides be devoid of stylish fonts and puppets that only adorn our slides without enhancing the presentation proper. The study on the working principle of hydraulic brakes only versus hydraulic brakes with other braking system has it that students performed better on retention and transfer tests in the first approach than those exposed to the latter approach (Mayer, Delecuv, & Ayres, 2007). This finding is also in consonant with the outcome of an earlier work by Mayer, Bove, Bryman, Mars, & Tapangco (1996).

Segmenting principle has it that doing a presentation at user-paced segments is more ideal than massed presentation. In the former, there is logical sequencing of slides or frames, each preceding slide ushering the subsequent one, rather than having unrelated and inconsistent slides or frames. So Clark and Mayer (2008) maintain that people learn better from a multimedia lesson presented user-paced segments rather than in a continuous unit. So though each slide is characterized by its distinct content, yet it is not totally independent as it should share close relationship with a subsequent slide and vice versa. The same study by Mayer and Chandler (2001) as reported by Clark and Mayer (2008) confirms that learners who received the segmented presentation performed better in transfer tests than those who were involved in a continuous presentation even though same conditions applied in both cases. The same work by Mayer, Dow and Mayer (2003) and its result equally agrees with this principle.

Personalization principle is a principle in favour of a conversational and not a formal style of presentations. A formal presentation is in total variance from a conversational or informal presentation in terms of achieving the social intent of learning as well as retention (Arshavskiy, 2013). Hence this principle has it that the use of first and second person constructions should be accommodated while developing eLearning materials or in

conventional presentations. This principle in eLearning induces learners to engage with the computer as social conversational partners Clark & Mayer (2008). Thus, they recommended first and second person pronouns in both text and audio, no wonder the accommodation of a coach even in such arrangement as a pedagogical agent. Personalization principle lessons using conversational style as against formal style favoured learners exposed to the former approach as against those exposed to the latter approach. These were the outcome of studies from a narrated animation on lightning function (Moreno & Mayer, 2000); narrated animations involving how the human lungs work (Mayer, Fennell, Farmer, & Campbell, 2004) and the lesson on stellar evolution and death that toed similar pattern (Kartel, 2010).

Statement of problem

The absence of graphics; charts, graphs, photos and animations in PowerPoint presentation is a common trend in the most recent. In other words, texts still herald most presentations, a feature that does not engage actively the mental process of our learners in the desired form. In some cases, frames have decorations that distort the intended message just as hasty presentation leads to skipping to projected slides. Therefore, the extent to which doctoral candidates who are involved in one form of seminars or the other deploy basic multimedia principles in their presentations calls for concern, especially if the objective of multimedia integration must be achieved. This is basically the crux of this empirical work.

Research questions

1. What kind of presentations contains slides with texts and graphic?
2. To what extent do texts match graphics?
3. How do you reference every slide that is projected?
4. Do narrations match exactly with texts on frames?
5. How do slides enhance decorations of presentations?
6. What presentations contain slides arranged in bit-by-bit sequence?
7. What type of presentation is done in conversational fashion?

Significance of study

The study is significant because it will meet the presentation needs of:

Students: Both undergraduates and post graduates (Masters and Doctoral) will benefit from this study to improve on their PowerPoint presentation.

Course designers: In conventional or e-presentations, course designers will find this paper a good recourse.

Lecturers: Most lectures are now being done via PowerPoint presentations, hence lecturers that have cued or yet to cue will equally gain for the rich menu of this paper.

METHODOLOGY

Design: The study is a survey design as it sets to ascertain the level of compliance of respondents in the integration of basic multimedia principles in their PowerPoint presentations.

Population: The population consists of all Ph.D Post Graduate students of some Faculties and Colleges of University of Port Harcourt in two academic sessions (2010/11 and 2011/2012), hence the study lasted for two years. The choice of Ph.D students only is informed by the fact that masters' students do their presentations devoid of PowerPoint, in most cases.

Sample size; A random sample of 120 (one hundred and twenty) students were used. The analysis of the sample size is as presented below

Table 1. Demography of sample size

Faculty/College	No
• Education	60
• Social science	20
• Humanities	20
• Engineering	20
	120

Instrumentation

A 31 –item questionnaire instrument designed in the likert-type format developed by the researchers was used in the study. The questionnaire had four scales (4,3, 2 &1) with the label (always, often, rarely & never) respectively. The mean (\bar{X}) value of 2.50 and above indicate the prevailing practice while the reverse is true where mean (\bar{X}) value is less than 2.50. The questionnaire instrument is in seven layers containing specific items that had bearing with each principle under consideration, as encapsulated in the research questions.

Validity and Reliability: Three knowledgeable researchers in test construction authenticated the validity of the items, as having bearing with the intent of the study. Also, a test-retest test, using a miniature sample different from those used in the study gave a reliability (r) index of 0.62 which is closed to unity (I). Thus, the instrument was considered to have met the criteria of validity and reliability and qualified to be used as it was capable of eliciting required response from the population sub set of the population.

ANALYSIS AND DISCUSSION OF FINDINGS

Table 2. Multimedia Principle

S/No	Modality	\bar{X}
1.	Your slides contain texts	4.00
2.	Your slides contain charts	1.92
3	Your slides contain pictures	2.04
4.	Your slides contain graphs	2.02

Table 2 indicates the extent of compliance of respondents to the multimedia principle in their PP presentation. The table reveals that the presentations are text dominant item (I) with (4.00) as against the other items (2, 3 and 4) with (1.92, 2.04 & 2.02) respectively. This

shows to a great extent that basic tenets of this multimedia principle are yet to be explored to its fullest by our students in their presentations. This type of presentation is at variance with the positions of Resnick (1991), Clark and Mayer (2008) and Mayer (2009).

Table 3: Contiguity Principle

S/No	Contiguity	\bar{X}
5.	You identify parts of a graphic	4.38
6.	You label corresponding parts	4.04
7.	You label a visual accordingly	3.08
8.	You give tables/figures title	3.06
9.	You give appendages title	4.00
10.	In complex graphics, arrows/lines intersect	2.40

The next table 3, shows a great compliance to the dictates of the contiguity principle in PP presentations, as it reflects to items (no. 5,6,7,8 & 9) show ($\bar{X} = 4.38, 4.04, 3.08, 3.06$ & 4.00) respectively. These values are above the acceptable means (\bar{x}) of 2.50 and so they indicate true compliance. However, the means (\bar{X}) value of 2.40 as against the 10th item meant that where complex diagrams/graphics are involved, the inter-section of arrows/lines do occur. The low mean below the acceptable mean is an indication that this is a non compliance to the rule, contrary to the outcomes of the studies by Mayer (2001) and Chandler and Sweller (1991).

Table 4: Modality Principle

S/No	Modality	\bar{X}
11.	Your slides contain graphics	4.37
12..	You use texts to explain graphics	4.02
13.	You narrates content of each slide	3.07
14.	Time make you not to refer to all projected slides	2.40

Table 4 shows extent of compliance to the modality principle. Items (no. 11, 12 & 13) show means (\bar{X}) values above mean(\bar{X}) value of 2.50, meaning true compliance. However, the mean(\bar{x}) value of 2.40 alone is absolute manifest of the absence of this principle in a presentation. Where slides are projected but not referred to as it sometimes occurs due to time factor negates the principle in questions. This is not in consonance with the outcome of the works supporting his principle (Moreno & Mayer, 1991) and (Mayer, Dow & Mayer, 2003).

Table 5: Redundancy principle

S/No	Redundancy	\bar{X}
15.	Your slides contain texts and graphics	4.50
16.	Your slides contain texts	4.42
17.	You refer to slides intermittently	2.45
18.	You read from texts	3.00

Table 5 however shows responses to indices of redundancy principle. While items (nos. 15, 16 & 17) show values of (4.50, 4, 42 & 3.00) respectively, item no 18 has a mean (\bar{X}) response of 2.45, a strict manifest of this principle. Reading from texts should not be in any form as audio makes the texts contained in the slide to be redundant, supporting the studies and findings by Mayer (2008) and Mayer, Heiser and Lonn (2001).

Table 6: Coherence Principle

S/No	Coherence	\bar{X}
19.	Relevant materials are contained in your slides	2.48
20.	Your slides lack decorations	2.38
21.	Decorative fonts beautify your frames	2.36
22.	You introduce superfluous graphics	2.42
23.	You introduce intrusive background audio	2.47

Table 6, shows that slides contain relevant materials as much as possible, item in (2.58). However, presenters sometimes decorate slides with graphics or fonts styles and perhaps introduce intrusive background audio. Items no. (20, 21, 22 & 23) show a strict manifest of non adherence to the recommendations of the coherence principles (Mayer, Delecuw & Ayres, 2007; Mayer, Bove, et al 2003).

Table 7: Segmenting Principle

S/No	Segmenting	\bar{X}
24.	No of slides depends on a presentation	4.66
25.	A presentation is usually in sequence	3.04
26.	It is usually divided into parts	3.00
27.	Each slide is content specific	3.14

Table 7, reveals that this principle applies to the letter. Items no. (24, 25 -26 & 27), show mean (\bar{X}) values of (4.60, 3.04, 3.06 & 3.14) corroborating conformity to this principle. This agrees with the works of (Mayer & Chandler, 2001; Mayer, Dow & Mayer, 2008).

Table 7: Personalization Principle

S/No	Personalization	\bar{X}
28.	Presentation is formal in its approach	4.08
29.	The use of "presenter" and "audience" occur	2.30
30.	Presentation is conversational in it approach	2.43
31.	The use of "I" and "you" occur	5.02

Finally, table 8 is an indication of non conformity to the personalization principle by the respondents. Items no (28 & 29) indicate mean (\bar{X}) of (4.08 & 5.02) respectively but items No (30 & 31) show mean (\bar{X}) of (2.30 & 2.43) which are wrong indicators or in the contrary. Presentations here wear formal colouration as against conversational and use of first or second person pronoun as recommended by the personalization principle (Moreno & Mayer, 2000; Mayer, et al. 2004; Kartel, 2010).

CONCLUSION

From the study, it is obvious that there is noticeable absence or full compliance of basic multimedia principles in PP presentations among PG students. While texts and graphics are dominant features of the presentations, the rightful integration of texts, graphics and human voice guided by basic principles is yet to be explored to its fullest. This however can be attributed to deficiency in knowledge of basic rules and norms of the principles in question.

RECOMMENDATIONS

These recommendations are in line with the major finding of this study

1. Users of PowerPoint presentation should strive to ensure that slides are not texts dominant. Graphics (charts, graph, pictures) should be integrated to ensure a presentation wears a multimedia posture, as well as activating mental processing of audience.
2. On no account should lines or arrows used in labeling a graphic or diagram be made to intersect because it is bound to distort the intended message.
3. Also, no reason justifies or is enough not to refer to a slide once it is projected. Never allow an audience to only see a slide projected without you making reference to it. The reason is that the modality principle is against such presentation.
4. In the same vein, nothing should make us to read from projected slides. Reading from our slides renders the texts redundant as our audience will only be hearing us, not making use of the texts. In no wise should the redundancy principle be allowed to set in a presentation.
5. The use of decorative slides should be avoided as much as possible for they do not actually carry intended message whether with texts or graphics. The fact is that where they appear in a slide, they are not in coherence with intended outcome as what they achieve is only the aesthetic look of a slide. In otherwords, they deviate from the norms of the coherence principle
6. Finally, our presentations should wear an informal and conversational tone rather than being too formal and unfriendly in approach. The fact remains that our audience is a composition of members of the same academic community with us or community of practice, in order to abide by the personalization principles.

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