SNAPSHOTS OF THE CURRENT USE OF MULTIMEDIA IN RURAL-BASED ENGLISH CLASSROOMS: A CASE STUDY OF A VOCATIONAL HIGHER-EDUCATION INSTITUTION

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Abstract: Multimedia use in education has been introduced to help both teachers and learners in classrooms. With the widespread distribution of technology, schools and campuses in remote areas of Indonesia have the chances to adopt multimedia to assist both subject matter and language learning. This phenomenon, however, also has its drawbacks. The use of modern learning media, with all its benefits, is sometimes proven ineffective if not used wisely. This research investigates the current use of multimedia in English classrooms of a rural-based vocational higher education institution. Qualitative enquiry in the form of classroom observations, semi-structured interviews with teachers, and student focus group interview, is adopted to answer the research questions which encompass: a)the type of multimedia used; b)the purposes behind the adoption of multimedia; c)the teachers’ and the students’ perception about the efficacy of lessons using multimedia. The result of this study highlights that there are three types of media used in English classrooms: slide presentation; video; and audio playback. The interview extracts point out that the rationale of the use of video and audio is purposed to increase students’ interest and motivation. Both students and teachers share the same perspective on the positive effects that multimedia use brings to the classroom. However, there is a gap between the two parties’ understandings on the outcome of the approach and on the value of using a wide range of multimedia content in English classrooms.

Keywords: Multimedia Use, Learners’ Perception, Teachers’ Perception, Rural-Based Learners, Indonesian Elt, EfL

INTRODUCTION

The purpose of this study is to investigate the current use of multimedia for English Language Teaching (ELT) in one of rural-based vocational tertiary education institution in Indonesia. Indonesia is one of the countries with biggest population of EFL (English as foreign language) learners (Lie, 2009) due to the fact that ELT is compulsory in secondary and tertiary level of education. In spite of its mandatory nature, at some stages researchers stated that, in general, the teaching of English in Indonesia cannot be categorized successful (Imperiani, 2012; Lie, 2009). There are gaps between regions since better command of English is more often associated with learners in middle-upper class society in urban area who have more familiarity with the language as well as opportunities and willingness to seek learning opportunities outside school when compared to their rural compatriots (Lamb, 2004). While the demand for English in Indonesia increases alongside nationwide recognition of its close association with globalization and its label as a language of prestige, most EFL learners, especially those in rural areas of Indonesia, are having some difficulties linking themselves to the language. English is sometimes depicted by some learners only as an artificial language spoken by people who are entirely different from them.

This circumstance therefore presents itself as a challenge for English teachers working in the described rural contexts as they are required to be more creative and innovative despite the lack of resources and funding. One of the options to increase students’ enthusiasm to English is by making the classroom more interactive and communicative. The efforts to make language classroom interesting and challenging for the students can be linked to one of many aspects in CLT (Communicative Language Teaching): the use of technology and multimedia. A number of research have found that overall, teachers have positive attitudes towards the use of technology in classroom (see, e.g., Li & Walsh, 2011; Marwan & Sweeney, 2010) and believe that language classrooms should adopt various types of technology to facilitate learning (Cahyani & Cahyono, 2013).

Based on these facts, it is interesting to see the current situation and practice of ELT in a relatively rural-based education institution. Here, the triggering factor that sparks current interest in the ELT practice in vocational higher education in this research is the notion that one of the purposes of ELT in vocational tertiary education is to develop students’ communicative skills to help them compete later in global marketplace and employment. The selection of a rural-based institution is purposed to see how teachers, despite the lack of resources, access to technology, and funding, conduct ELT practice in a setting where the use of English is limited to only classrooms use.
This study is designed to answer the main research question which related to the current use of technology and multimedia for ELT in one of rural-based vocational tertiary education institution in Sumatra. For the entire course of the institution in which this study will take place is addressed as Campus X (pseudonym used). To answer this main research question, this study will be directed to answer these following sub-questions: a) what are the types of multimedia used for ELT in Campus X and the rationale behind the their use?; b) what are teachers’ and students’ perceptions towards the use of technology and multimedia use in ELT in Campus X?

The Use of Technology and Multimedia in English Language Teaching

The use of technology and multimedia in language teaching and learning in most of literature are associated with CALL (Computer Assisted Language Learning), which has been the magnet for researchers in the past two decades (see, e.g., Bañados, 2006; Debski, 2000). As one of the recent interests of scholars especially in the field of ELT and applied linguistics, CALL roughly covers the use of computer hardware and software; internet network; e-learning; online community and environment, to facilitate language learning. In western contexts, nowadays, researches on CALL are mainly focused on the use of advanced software and e-learning, for example the use of wikis and computer-mediated communication (CMC) (Goertler, 2009). On the other hand, scholars from developing countries are mostly focused on the process of introduction and integration of technology and internet for ELT in schools and colleges (see, e.g., Yunus, 2007; Zhong & Shen, 2002) since the introduction of technology in language teaching is relatively new to the context of developing countries.

In their study about the integration of ICT (Information and Communication Technology) and EFL in Chinese secondary schools, Li and Walsh (2011) state that in that particular setting teachers use computers mainly to explain sentence structures, grammars, and vocabulary, as well as to present audio visual materials and to deliver drills and practice exercise. It is also revealed that Power Point is still the most common program that the teachers use to present information to students. Furthermore, they also find that EFL teachers in their study recognize the fact that ICT can help them to create more enjoyable and interesting classes, as well as to introduce authentic materials. It is also found that the teachers in this context see the use of computers as a one of possible solutions to help them shift from traditional grammar-based teaching.

While the use of technology and multimedia is sometimes termed as one, in fact, these two aspects are actually different; to be exact, they are like two sides of a coin. The use of technology in language teaching has always been with the use of computers and computer-related devices, hardware and software, while the use of multimedia, is related to the use of graphics, images; still or moving; sounds; and videos. Regarding of the use of videos as one of the most common media in language classrooms, Cakir (2006) highlights that the use of video cannot be separated from the widespread adoption of communicative approach since audio-visual materials are helpful to stimulate and facilitate foreign language learning. This author also states that videos can bring a wide range of communicative activities to the classroom. Furthermore, it is emphasized in this article that the use of videos are favored by learners as it shows them authentic use of language in the cultural context of target language. It also provides visual clues to meaning that can help students interpret, repeat, predict, reply, etc.

Multimedia is in fact defined as a way to present information by involving elements other than plain texts such as graphics, video, and audio (Greenlaw & Hepp, 1999, as cited in Gilakjani & Ahmadi, 2011). It can act as attention grabber and as a tool to boost learners’ interest. However, the use of multimedia itself in English classroom does not automatically create a good learning environment (Gilakjani & Ahmadi, 2011). In some cases, direct effect of learning English with multimedia assistance cannot be clearly identified. A quantitative experimental study by Liu (2010) finds that there is no statistically significant difference in English proficiency test scores found between groups of students which had had lessons in multimedia-instruction classroom and those in traditional classroom. Furthermore, a study by Xu (2010) points out typical problems that may arise in a ‘overused’ multimedia English classrooms such as the loss of speaking ability and the shrinking of students’ potential. These studies highlight that modern technology such as multimedia can only work under the merit of effective education and advanced educational theory (Gilakjani & Ahmadi, 2011).

Despite its tendency to have possible drawbacks, the use of multimedia nonetheless provides alternatives for teachers to facilitate learners with their different needs and learning styles since it can cover and support a wide range of activities. The use of multimedia in ELT is also prove useful when it comes to learners with low prior domain knowledge and low motivation (Gilakjani & Ahmadi, 2011), conditions which is often attributed to rural-based English learners of Indonesia.

Further adoption of multimedia use within language classroom can also be traced within the large body of literature nowadays. Some examples of these are the use of interactive whiteboards (Cutrim Schmid,
This study is purposed to see the use of multimedia as one of current forms of technology in education, especially in English language teaching within a rural-based vocational college in Sumatra, Indonesia. Since each context is unique and different, therefore, even though similar research has been done in different areas in Indonesia, it is hoped that the present study will make contribution to the field; a detailed insights towards ELT practice in specific region in Indonesia.

METHODOLOGY

This study adopts case study as a qualitative research design to investigate the use of technology and multimedia as a phenomenon in Campus X as one of rural-based vocational tertiary education in Sumatra, Indonesia. The justification for the selection of case study as the research design is based on the notion that the purpose of case study is to understand a case in depth, in its natural setting, by recognizing its complexity and its context by investigating a phenomenon happening in a bounded context, which may refer to an individual, a role, a small group, an organization, a community, or even a nation (Punch, 2009). Here, the Campus X is the bounded context; bounded context in a case study means that a case should be set in temporal, geographical, organizational, or any other context which enables the researcher to draw boundaries around the case (Hitchcock and Hughes 1995, as cited in Cohen, Manion, & Morrison, 2007).

In this case, case study design is considered fit for the purpose of this study which aims to capture a phenomenon in this particular setting of rural-based Indonesian vocational tertiary education setting, since in education, “case studies focus on one particular instance of educational experience and attempt to gain theoretical and professional insights from a full documentation of that instance” (Freebody, 2003, p. 81).

In designing a case study, a researcher should be aware of the purpose of the planned case study, so that s/he can determine the appropriate type of case study to be adopted. Merriam (1998) explains the types of case studies from two different perspectives. The first is from its disciplinary orientations. In the field of education, case study research “is conducted so that specific issues and problems of practice can be identified and explained” (1998, p. 34). In this book, case study in education can be categorized into: ethnographic case study, where the focus is on the culture, for example culture of a school, a group of students or classroom behavior; historical case study, which mainly involves the chronological descriptions of institutions, programs, and practices; psychological case study, which focus on the individual and learning process; and sociological case study, which investigates “the constructs of society and socialization in studying educational phenomena” (1998, p. 37).

The second perspective is the overall intent. Based on this, Merriam (1998) classifies case studies into: descriptive case study; interpretive case study; evaluative case study; and multiple case studies. Descriptive case study provides details of investigated phenomenon. The intent in conducting this type of case study is solely to present basic information about areas of education which is considered to be under researched by scholars. In interpretive case studies, the descriptions of the investigated phenomenon are used to develop conceptual categories; to challenge or to support certain theoretical assumptions. Evaluative case study is usually adopted to make judgments about the effectiveness or success rate as well as indicators for continuity of certain programs in education. In the case of multiple case studies where more than one cases are investigated, data is collected and analyzed from several independent cases, to be compared and contrasted.

This study is designed to be a descriptive case study, since there will be no effort made to generate a theory that can be accepted globally or to make interpretations to support or challenge existing theories. However, in designing a case study, it must be decided in advance whether the study will focus on ‘distinctive’ or ‘typical’ case that represents a set of dimension such as geographical region, a specific culture, or socio-economic backgrounds (Freebody, 2003). In that regard, this study is mainly purposed to capture the distinctive feature of ELT practice within one particular institution in the forms of technology and multimedia use. However, it is not impossible that in the future, the result of this study can later be used as benchmark to generate a hypothesis about typical ELT practice rural-based higher education setting throughout Indonesia.

Participants

This study involved three English teachers in Campus X and approximately 6 students from three classes under the responsibility of the three English teachers. Student participant participated through focus group interviews, and the three teachers participated in the study through individual semi-structured interviews.
Data Collection Methods

One of the characteristics of case study design is that it employs multiple procedures for data collection and analysis. Freebody (2013) highlights these multiple procedures in case studies are purposed to give opportunities for researchers to compare and contrast interpretations, develop unexpected findings, and explore findings in order test the initial hypothesis. The use of multiple data collection techniques is also seen as an effort of data triangulation which can assist data saturation process later in the analysis.

In this study, three data collection methods will be employed to accommodate data triangulation from three different perspectives on the phenomenon: teachers'; students'; and the researchers. The three data collection tools are described as follows, in a chronological order of procedures:

Classroom Observations

In this study, an observation schedule was arranged for each of the three classes. Due to the fact that this proposed study is relatively small-scaled, each of the class was only observed once during the two-month data collection period. In total, there were three observation sessions.

Regarding the use of observations in qualitative study, Punch (2009) points that a more unstructured approach should be taken. This means that, in conducting observations, the researcher will not use any predetermined categories and classifications, instead, the categories and concepts for analyzing and describing observational data will rather be emergent rather than imposed from the beginning.

Semi-Structured Interviews with Teachers

In this study, each of the three English teachers was interviewed individually, during the course of the semester. Since this proposed study is relatively a small-scale project which has to be conducted in a relatively short timeframe, each of the teachers was interviewed only once during the 2 months data collection period.

Merriam (1998) highlights that in qualitative research interviews are most likely to be more open-ended and less structured to assure that respondents have adequate space to maintain their signature on their answers. She also describes that semi-structured interviews should still be guided by a list of questions and topics to be explored even though there are elements of flexibility in the wordings and the order of questions. This is purposed to give the researcher enough opportunity and space to respond to dynamics of the interview as well as to take the freedom to explore new emerging topics during the process.

Focus Group Interview with Students

The justification for the use of focus group interviews to get the students’ perspective on the phenomenon is associated to the fact that “well-facilitated group interaction can assist in bringing to the surface aspects of a situation that might not otherwise be exposed” (Punch, 2009, p. 147). This means that in interviewing students, group interaction will be useful as a prompt to get them to express their opinions which may not be done through individual interviews. Cohen et al. (2007) explain further that in focus group interviews, the participants interact with each other rather than with the interviewer so that the views of the participants will more likely to emerge. This confirms that focus group discussion has the potential to “stimulate people in making explicit their views, perceptions, motives, and reasons” (Punch, 2009, p. 147).

In this study, there was only one focus group interview. Students were asked to join the focus group discussion. There were 6 students participating in this process.

FINDINGS AND DISCUSSIONS

Findings

The Use and the Rationale of Multimedia in English Classrooms

One of the most frequently questioned aspects in rural-based ELT practice is the ability of teachers to create an innovative and creative approach to teaching with limited access to resources. In Campus X, English teachers have very limited interaction time in classrooms, so a teacher in this context have to make sure that every lesson is effective. Furthermore, there is a need to establish interesting and motivating lessons in this kind of context since there is a lack of immediate needs and opportunity for students to use English as an active language. One of the efforts to create a supportive learning atmosphere is by providing interesting materials for any types of learners. In this case, using multimedia is seen as a common approach since it can facilitate various kinds of activities in classroom. Furthermore, using multimedia can help students by giving more exposure to the authentic language use, a key to develop intercultural competence. If this mission can be accomplished, of course it will be an added value to the English language course itself.
This study finds there are three types of multimedia used by the three lecturers in this campus. These include slide presentation (Power Point), video playbacks, and audio playbacks (with text displayed later). The use of each of the item and its rationale in this context will be explained respectively. Figure 1 below summarizes the types of multimedia found in this study and their frequency of use by each teacher respondents.

<table>
<thead>
<tr>
<th>Type of multimedia found</th>
<th>Lecturer A</th>
<th>Lecturer B</th>
<th>Lecturer C</th>
</tr>
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<tbody>
<tr>
<td>Slide Presentation</td>
<td>frequently</td>
<td>rarely</td>
<td>frequently</td>
</tr>
<tr>
<td>Video Playback</td>
<td>rarely</td>
<td>never</td>
<td>Frequently</td>
</tr>
<tr>
<td>Audio playback with text</td>
<td>never</td>
<td>never</td>
<td>occasionally</td>
</tr>
</tbody>
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Figure 1. Types of multimedia found in English classes and their frequency of use by the three teachers.

The first type of multimedia found in this study is slide presentation. Based on the observation session and the extract of the interview, lecturer A basically uses slide presentation in each of his session. This lecturer stated that the use of slide presentation, on the one hand, is purposed to help students to understand the topics being explained. On the other hand, he further added that it also make his job easier since it enables him to present the materials systematically. He considered the use of slide presentation crucial since the materials presented are related to the field of agricultural engineering and machinery that needs a lot of visualization to present. This decision seems agreeable on the students’ side. The focus group discussion with students highlights that in general, students in lecturer A classes stated that they can understand the topics better with the slide presentation. The same approach is also taken by lecturer C, the only difference is that this lecturer always follow the slide presentations with the use of other kinds of multimedia such as videos and audio. He also utilizes games and role play as a follow up material after slide presentations. These kinds of follow up activities are getting the most of students’ interest. These facts are shown in focus group discussion session where students of lecturer C eagerly describe the activities. In the case of lecturer B, there is not much to be explored since he admitted that he uses slide presentation rarely. In an observation session in one of his classes, it is revealed that he mostly uses whiteboard and marker as a medium to explain grammar topics to students.

The second type of multimedia found in this study is video. In the case of lecture A, the use of video playback is very rare. This is partly related to the limited access to relevant videos. Lecure C, on the other hand, based on classroom observation seems to be using video quite frequently. This assumption is supported by the familiarity of the students to the procedures. According to lecture C, he really wants to provide a real-life authentic use of language to students. This is purposed to introduce the language as well as the cultural aspects bound to it. Furthermore this lecturer stated that he wants his students to learn native speaker-like pronunciation.

The third existing multimedia in the context of this study is audio playback (song) with displayed text. Based on observation session and the extract of the interview, it is found that lecturer C is the only respondent who opted to use this platform. The use of audio playback here is also to support the emphasis on pronunciation. Unlike videos, this method is used less frequently. Students in focus group discussion stated that this particular method only used by lecturer C in two different occasions.

Teachers’ and Students’ Perceptions on the Use and the Effectiveness of Multimedia in English Classrooms

The extract of interview with lecturer A highlights his point of view about the urgency for the adoption of multimedia in English classroom. His decision to use videos and slide presentations in classroom is related to his understanding to the fact that technology is a potential tool to assist learning processes. This teacher emphasizes that using videos as learning materials can help a lot in helping students to improve their listening ability, and in a broader sense, also help students to maintain a positive attitude towards English language learning process. However, this lecturer realizes that increases in students’ motivation does not mean automatically instant result can be soon be traced. This lecturer believes that all processes takes time.

On the contrary, lecturer B is the only in this study to admit having used the least of multimedia in his classes. In the interview, he stated that since his lessons are mainly focused on grammar; the use of power point presentations and multimedia is very rare. He implied that it is difficult to utilize and correlate multimedia in a grammar-based English classroom, since there will be limited time to create and find the materials such as video and audio. This opinion is parallel to the result of the classroom observation session in which this lecturer uses most of time to assist students in completing traditional written grammar practices.

The other participant, lecturer C, utilizes multimedia in almost all of his lessons. This includes slide presentations, video, and audio playbacks. Furthermore, this lecturer believes that video is the most complete
package when it comes to multimedia since it can bring images, sound, and most importantly, target culture at the same time. The use of multimedia, in his opinion, is hence purposed to help students to get more exposure to English language and to be able to understand more about topics being discussed. In terms of efficacy, this lecturer claims that there are improvements in students’ grade and motivation, as well as their mastery of vocabulary.

From different point of views, students in focus group interview highlights the students share the same perceptions on the positive effects of multimedia in English classrooms. Each of students here represents classes that are taught by the three lecturers. In general, all students agree that the use of multimedia is well-proportioned, in the meaning that it is relevant to the topics being discussed. Furthermore, the students also confirm to the statement that the use of multimedia in English classrooms so far is considered effective. This consensus is based on their judgment that multimedia content should be interesting and motivating for students. This proves that in the focus group discussion there is no complaint made by students on the approaches taken by each of the lecturers.

DISCUSSIONS

This study finds that there are three types of multimedia used in English classrooms of Campus X namely slide presentation; video playback; and audio playback with displayed text. Slide presentation is considered a type of multimedia since it provides information not only in plain text (Greenlaw & Hepp, as cited in Gilakjani & Ahmadi, 2011). Furthermore, the results of this study also highlights that all three lecturer participants are using Power Point, a common slide presentation program. This finding confirms the results a study of Li and Walsh (2011) stating that Power Point (slide presentation) is the most common technology used in English classrooms because of its features that enable teachers to show visualizations through pictures, graphs, or animation.

The findings also show that one of the lecturers utilizing videos in their classroom sessions. From the extract of the interviews it can be seen that the rationale behind the use of videos is that one; video can present a perfect blend of information combining image, sound, and text. Two; video can assist learners to gain a deeper understanding on the authentic use of language. This is particularly relevant to English classrooms in this rural context where students are of limited proficiency, and the role of visual clues is paramount (Olmeda, 2003, as cited in Gilkajani & Ahmadi, 2011). Three; in terms of learners’ affective side, complete multimedia presentation such as video can help students to maintain their interest in learning process (Xu, 2010). The use of songs/audio playback accompanied with displayed text has similar purposes to video. The only difference is on the procedures and the topics associated with it.

One of the lecturers (lecturer B) stated in the interview that he only occasionally used Power Point (slide presentation) to help him explaining grammar topics. He also admitted that he does not really use multimedia in his classrooms. The similar situation also happened in lecturer A class in which slide presentation is almost the only type of multimedia being used. In this situation, the reluctance to adopt or use significant portion of multimedia in English classrooms is caused by certain factors. Two of the prevalent factors to this specific circumstance have been stated by Li and Walsh (2011); lack of time to prepare lessons; and lack of digital resources. In this particular case, teachers’ workload also plays a significant role on the creativity and willingness to try something new; the heavier the workload, the more monotonous the lessons tend to be.

It is quite a sight to see that the use of multimedia in English classrooms exists even in a rural-based campus like Campus X. This phenomenon cannot be separated from factors such as increasing awareness from teachers towards better education practice and new paradigms in teaching. Li and Walsh (2011) highlight factors that are pushing teachers to adopt technology in EFL classes. Among those factors, benefit for teachers and learners as well as motivating aspects of ICT, are proven to be relevant to this present study.

The teachers’ statements during the interview show that the purposes to use multimedia in English classrooms are: First, to maintain and increase students’ interest in learning, second, to improve learners’ comprehension on the language aspects being studied. This is relevant to what has been stated by Xu (2010) that the use of multimedia is mainly targeted to: cultivate student interest; promote communication capacity; widen students’ knowledge on cultural aspects of English language; and to improve teaching effects. Furthermore, in this study the use video and audio playbacks are also targeted to expose students to authentic language use as well as to bring in the target culture. This findings corresponds with Cakir (2006) statement emphasizing that audio visual materials provide learners authentic use of language in the cultural context of target language which can also become visual clues to meaning that can help students interpret, repeat, predict, reply, etc.

In the specific case of the use of audio playbacks with displayed text, lecturer C is trying to introduce correct, native-like pronunciation to the students. This effort can be categorized as an attempt to
workloads should be well-proportioned. Attention to teaching workloads. A teacher can be creative when he/she enjoys teaching. This means that creativity in planning lessons. In addition, to support teachers’ creativity, resources for all teachers. This is considered important since access to teaching resources influence teachers multimedia is utilized. Secondly, multimedia. There is a big opportunity of a more engaging learning process when the technology and for all of the lecturers/teachers in Campus X. In terms of the use of multimedia use in English classrooms in this particular context, it is advised rural-based learners, whose awareness on multimedia class and its potentials is limited. Suggestions

CONCLUSIONS AND SUGGESTIONS

Conclusions

This study finds that there are three types of multimedia used in English classrooms in Campus X, namely slide presentation; video; and audio with displayed text. From the three types of multimedia, slide presentation program such as Power Point is the most used since all of the three lecturers in this study are using it with different proportions. The second frequently-used multimedia is video with two lecturers claiming to be using it. From the two lecturers, only lecturer C admitted and observed to be using video regularly. The last type of multimedia, audio (song) is only used by one of the lecturers (lecturer C).

The rationale to use multimedia in this present context is mainly to assist students’ understanding on the language aspects being learned with multimedia acting as visual cues. The second reason is because it is handy for lecturers, so both teachers and learners take benefits from multimedia. The third reason is because multimedia like songs and videos can provide exposure to authentic use of English for students. This will help students in terms of pronunciation learning and intercultural competence development.

From the findings of this study, it can also be concluded that although the use of multimedia is considered effective by both students and teachers, it still has not yet reach its full potential. This can be seen through the limited forms of existing multimedia use in this campus and the fact that there is one particular lecturer (lecturer C) who is reluctant to use multimedia in his classes. This adds to the fact that students are rural-based learners, whose awareness on multimedia class and its potentials is limited.

Suggestions

In terms of the use of multimedia use in English classrooms in this particular context, it is advised for all of the lecturers/teachers in Campus X to be more flexible in terms of possibility for adoption of multimedia. There is a big opportunity of a more engaging learning process when the technology and multimedia is utilized. Secondly, Campus X management should provide enough access to digital teaching resources for all teachers. This is considered important since access to teaching resources influence teachers creativity in planning lessons. In addition, to support teachers’ creativity, campus X should also pay a careful attention to teaching workloads. A teacher can be creative when he/she enjoys teaching. This means that workloads should be well-proportioned.
This study is designed as an identification study. For future research, it is advisable for researchers to look at certain types of multimedia comprehensively. This kind of analysis can be sharpened by measuring the outcome of the use of each type of multimedia, which for instance, can be conducted in an action research platform, or a material research and development (R & D) study.

REFERENCES