
Combination of audiovisual message design on prevention technique of cocoa pest attack using video medium as extension media

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Abstract: The main purpose of this paper is to determine the improvement in farmers' knowledge about cocoa pests using video and the influence of knowledge improvement to the cocoa farmers. An experiment was conducted involving 80 respondents selected randomly from farmer groups in Way Jepara Subdistrict, Mataram Baru Subdistrict, East Lampung District, Lampung Province, Indonesia where respondents were divided into two groups and each group received two treatments. Data related to respondents' knowledge level is obtained through pre-test and post-test method. Analysis of variance (ANOVA) technique was used to analyse relationship between variables. This paper highlighted the result related to differences in farmers' knowledge before and after the experiment. It is found that the type of narrative language used in video did not affect in farmers' knowledge improvement. The experiment also found that the message presentation through video medium and the form of narrative presentation used was in an indirect narration form.

Keywords: communication; prevention technique; message; audio visual; relationship between variables; circular e-learning workware; public e-learning; response audience; effective tools; visual message; namely language; pre-test; treatment; post-test.

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Biographical notes: Anna Gustina Zainal has a Doctor of Communication Studies and has published a number of academic papers through national and international journals. She is an Associate Professor in Communication at the Faculty of Social and Political Sciences, Lampung University. She also has books on lobbying and negotiation techniques and Rudat Culture: in terms of the perspective of women's networks and communication behaviour. She also participated in a number of activities with the theme of public relations and public speaking and was active in social activities relating to women and children. Her research has been done relating to development communication, cultural communication and gender communication.

1 Introduction

Cocoa plants are one of the superior products of Lampung Province, but currently, cocoa products have decreased production due to natural factors, lack of production facilities

and infrastructure, and pest attacks, especially leaf-eating pests and fruit flies (*Dacus* spp). Even in Sumberhadi Village, East Lampung Regency, fruit fly attacks have caused 40 percent of the 500 hectares of cocoa to rot. This problem is usually handled by the local government by providing conventional training that emphasises verbalism. Starting from the idea that audiovisuals are effective tools in the teaching-learning process (Bravo et al., 2011); we modified the training of cocoa farmers by using audiovisual as the main training tool. Beside that, audiovisual is a communication media that appears along with the development of modern information and communication technology (Sandrelli and Perez, 2007). This is more complex than text messaging because it contains sound and moving images.

Audiovisual is a technology-based learning media that can be used as an alternative in optimising the learning process because it has aspects that are easily packaged, interesting, and can be improved at any time and also can deliver more interesting and attractive learning material (Forceville, 2009) as it relies on two senses at once, namely the sense of hearing and sight (Gambier and Gottlieb, 2001). Audiovisual research and applications, especially in the field of education, have been practiced by the USA in the period 1920–1930 with the emergence of visual movements as a reaction to verbalism. The literature review results show that audiovisual studies are more concentrated in the education and health sectors. Even through the use of audiovisual, learning can be more interesting for two-way traffic.

Although scientists have examined the topic on effects of audiovisual messages, but rarely examined this topic among farmers. This research is aimed to fill the gap and is expected to contribute to some contemporary discussion topics related to audiovisual phenomena such as, audiovisual literacy, audiovisual competence, interpretive skills audiovisual or audiovisual journalism. Even, the use of communication media is not optimal due to lack of broadcasting or news to advance both theory and empirical research not only in the area of new media technologies but also for more traditional media (Eveland, 2003).

Based on existing research works, this paper aims to determine the increase in farmers' knowledge about cocoa pests using video and the impact of increased knowledge of cocoa farmers in cocoa production. Some of the existing research works on audiovisual use in increasing knowledge is mostly implemented in education and health sectors but very rarely applied in agriculture.

2 Research method

This paper presents an experimental research where the independent variables are the key factors to form the visual message, namely language (Indonesian and Javanese) and the type of visual message (realistic and silent). The dependent variable is the increase in farmers' knowledge of cocoa pests. The experimental procedure consists of following steps:

- a the first ten minutes are used to provide an explanation and prepare the respondent in a research situation and familiarise them with the communication media that will be used
- b pre-test (15 minutes)

- c treatment (15 minutes)
- d post-test (15 minutes).

The research respondents were 80 people who were randomly selected from four farmer groups in Way Jepara District, Mataram Baru Regency, East Lampung Regency and Lampung Province. The respondents were divided into two groups, namely: group A and group B and two treatments (realistic videos and still videos) were given. Data were analysed by ANOVA method, which was used to describe the implementation of adaptive numerical (AN) techniques to predict the behaviour of rainfall for commercial material.

3 Results and discussion

3.1 Characteristics of respondents

Research respondents were members of farmer groups with the distribution of respondents having diverse characteristics (Table 1). The average age of respondents was 36–45 years, and some were 25–35 years old. Respondents' knowledge of cocoa pests was categorised as low because 81.25 percentage of farmer group members did not understand cocoa. But respondents felt the need of information about cocoa. Almost all respondents had radio and television, but only a few percentages had computers (40%), newspapers (60%), and magazines (50%). Most respondents accessed newspapers (82.5%) and radio (52.5%) less than one hour per week. This shows that the existing communication media facilities are not used optimally. Also, the media that broadcast news does not have enough information about cocoa pests. Therefore, mix of attributes (Eveland, 2003) is needed to improve the knowledge and information gained by farmers about cocoa pests.

3.2 Pre-test and post-test results

Pre-test results showed that the respondents' initial knowledge about cocoa pests was low. The lowest score value of 12 was obtained by group A, while the highest score value was obtained by group B. Score was measured before the respondent viewed the video. Table 2 shows that there is a difference between group A and group B. To find out whether the differences in this knowledge differ significantly or not, a variance analysis is required to find out difference value between the two groups. According to Forceville (2009) and Sandrelli and Perez (2007), the purpose of audiovisual is to give messages and knowledge to someone through sound and moving images so that the message is more attractive, effective and interesting.

The result of ANOVA shown in Table 3 depicts that the average value of respondents' initial knowledge on the four treatments was not significantly different ($F_{\text{count}} < F_{\text{table}}$ at the trust level of 0.05). Thus, it can be concluded that the respondents' initial knowledge level in each group of treatments on fruit borer disease was the same. They did not actually understand what is meant by cocoa fruit borer pest and how the prevention and treatment to be done. It means that the level of knowledge among farmers both within and between groups regarding the characteristics of pests that attack cocoa is still very low and therefore, should be taught both verbally and visually. Thus the

audiovisual method which can give messages to others with visual movements as a reaction to verbalism even in facilitating people to understand learning is more interesting (Sandrelli and Perez, 2007).

After pre-test, researcher gave treatment to two research groups. In this treatment, each group was asked to view a video presentation containing cocoa pest information. One video used Indonesian language with realistic visual message and one more video used Javanese language with silent visual message. After this treatment, researcher conducted post-test. Table 4 shows the result of post-test. The post-test results show the mean score of respondents for each treatment group which is not much different.

Table 1 Characteristics of respondent

<i>Respondent attribute</i>	<i>Category</i>	<i>Percentage</i>
Sex	Man	47.5
	Women	52.5
	<i>Total</i>	<i>100</i>
Age	25–40 years old	43.75
	>41 years old	56.25
	<i>Total</i>	<i>100</i>
Do you know about cocoa pest management?	Know	18.75
	Do not know	81.25
	<i>Total</i>	<i>100</i>
What do you think about information on cocoa pest management?	Very important	78.75
	Important	21.25
	Less important	
	Do not know	
	<i>Total</i>	<i>100</i>
Do you have [...] at your home?	Newspaper	60
	Magazine	50
	Radio	100
	Television	100
	VCD/DVD	90
	Computer	40
	Newspaper	
How long you accessing [...] in one week?	<1 hour	82.5
	1–3 hour	17.5
	>3 hour	
	<i>Total</i>	<i>100</i>
	Radio	
	<1 hour	52.5
	1–3 hour	48.75
>3 hour		
	<i>Total</i>	<i>100</i>

Source: Cvijović et al. (2005)

Table 2 Score of respondents' initial knowledge by treatment group

Treatment factor	Visualisation		Average
	R	D	
Language Indonesian (A)	12.75	12.85	12.80
Javanese (B)	13.15	13.10	13.13
Average	12.95	12.98	12.96

Table 3 ANOVA analysis results on initial knowledge score of respondents

Sources of diversity	JK	KT	F-count	F-table	P-values
Between group	2.238	0.746	0.178to	2.727	0.911
In group	318.650	4.193			
Total	320.888				

Note: To = not significantly different.

Source: Cvijović et al. (2005)

Table 4 Post-test scores of respondents by treatment group

Treatment factor	Visualisation		Average
	R	D	
Language Indonesian	27.60	26.60	27.10
Javanese	27.70	26.65	27.18
Average	27.65	26.63	27.14

Source: Cvijović et al. (2005)

At level of $P = 0.05$, there is no impact of treatment on respondents' knowledge improvement. Therefore, audiovisuals are effective tools in the teaching-learning process (Forceville, 2009; Bravo et al., 2011).

Table 5 Results of ANOVA to final knowledge scores of respondents

Diversity source	db	JK	KT	F-count	F-table	P-value
Inter group	3	21.138	7.046	1.002 ^m	2.727	0.397
In group	76	534.350	7.031			
Total	79	555.488				

Note: To = not significantly different.

Source: Cvijović et al. (2005)

3.3 Respondents' knowledge improvement

Table 6 shows mean score of respondents' knowledge before receiving treatment which is 12.96 and mean value after receiving treatment (post-test) is 27.13. Average of improvement in knowledge scores is 14.17. Result of paired sample t-test between pre-test and post-test value is very significant that is 2.576 at $\alpha = 0.01$ and t_{count} value

(38.078) with t_{table} (2.576) (Table 7). It means that, there was a significant impact of video used in the process of delivering messages. Use of narrative language (Javanese and Indonesian) and the form of visual message (realistic and silent) can improve the respondents' knowledge about cocoa pests. This shows that the message delivered is able to provide informative and educative knowledge to the respondents.

Table 6 Scores of pre-test, post-test, and farmer's knowledge improvement

<i>Number</i>	<i>Treatment</i>	<i>Pre-test</i>	<i>Post-test</i>	<i>Knowledge improvement</i>
1	Silent and Indonesian	15	29	14
2		13	27	14
3		13	29	16
1	Silent and Javanese	15	28	13
2		13	29	16
3		14	26	12
1	Realistic and Indonesian	13	28	15
2		15	22	7
3		14	27	13
1	Realistic and Javanese	15	29	14
2		15	27	12
3		14	27	13
<i>Total</i>		<i>1,037</i>	<i>2,171</i>	<i>11,34</i>
<i>Average</i>		<i>12.96</i>	<i>27.14</i>	<i>1-1.17</i>

Source: Cvijović et al. (2005)

Table 7 t test analysis result average score of pre-test and post-test of respondents

<i>Average</i>		<i>T-count</i>	<i>T-table</i> <i>a = 0.05</i>	<i>T-table</i> <i>a = 0.01</i>
<i>Post-test</i>	<i>Pre-test</i>			
27.14	12.96	38.078	1.96	2.576

Note: Information: significantly different of a level = 0.01.

Source: Cvijović et al. (2005)

This medium is also used effectively to stimulate rural people's motivation towards active participation in the development process. Making video in such a way that the farmer groups are able to grasp the information easily, is one of the important factors to convey the messages to the farmer groups. Use of language that is not so difficult and the use of visual that is easy to understand, attracts the respondents. This condition is the defining factor in the process of receiving information about cocoa pests.

3.4 The influence of narrative language

The average score of knowledge improvement of group A was slightly higher than group B. The knowledge of respondents who viewed the realistic video were slightly higher than those who viewed the silent video (Table 8). However, the average score of

knowledge improvement due to language factors was not significantly different (see Table 9). It shows F_{count} value (0.115) < from F_{table} at the trust level 0.05 and 0.01. It means that the language used has no significant effect on respondents' knowledge improvement. Phenomenon of the use of this language can be studied further, whether there is an indication of the beginning of cultural transformation, especially language in this era of globalisation. This shows that the message delivered in visual form is more effective and interesting than in the form of sound (Eisner, 2008).

Table 8 Results of average score of respondents' knowledge improvement by treatment group

Treatment factor		Visualisation		Average
		R	D	
Language	Indonesia (A)	14.85	13.75	14.30
	Jawa (B)	14.55	13.55	14.05
Average		14.70	13.65	14.18

Source: Cvijović et al. (2005)

Table 9 Two-way ANOVA results of score respondents' knowledge improvement

Factor	Knowledge improvement						P-values
	Db	JK	KT	F_{count}	F_{table}		
					0.05	0.01	
Type of language	1	1.250	1.250	0.115	3.969	6.986	0.735
Type of visual message	1	22.050	22.050	2.033	3.969	6.986	0.158
<i>Interaction</i>							
Type of language * type of visual message	1	0.050	0.050	0.005	3.969	6.986	0.946
Experimental error	76	824.200	10.845				
Total	79	847.550					

Note: Information: to = not significantly different.

Source: Cvijović et al. (2005)

3.5 Visual message effect

Table 8 shows that the average score of knowledge improvement of respondents who viewed realistic video (14.70) was higher than respondents who viewed video with silent visual (13.65). But, the average score of knowledge improvement caused by the type of visual message was not significantly different. This was seen with F_{count} (2.033) < F_{table} on the trust level of 0.05 and 0.01. Thus, an audio visual media has more capabilities, because this media relies on two senses at once, namely the sense of hearing and sense of sight. With the media it is hoped that it can generate motivation in learning and clarify the material presented (Gambier and Gottlieb, 2001).

3.6 The interaction influence of narrative language and visual message form

Table 9 shows that statistically interaction of narrative language form and visual message form is not significantly different at $p = 0.05$. It was shown $F_{\text{count}} (0.005) < F_{\text{table}}$, which means that the influence of narrative language with visual messages form was not related to each other for the improvement of respondents' knowledge. The result of research showed that treatment of Indonesian language narrative gave rather a high score compared to the use of Japanese language, as well as the use of realistic visual gave rather a high score compared to silent visual. But to prove that the score was significantly different or not, Duncan's multiple range test (Table 10) was used. Duncan's multiple range test or DMRT test is used to determine the best type based on its ranking. This test was carried out because there were significant differences in the results of the analysis of variance (Nutt, 2008). According to Nutt (2000), this test was also conducted to determine the differences in the treatment given by the F test. This shows that language does not have a major influence on one's understanding and a realistic visual form is more capable to give a more effective and attractive message.

Table 10 also shows an indication of the average score of treatment groups using a combination of Indonesian narrative language and realistic visual messages rather high than others, although this score cannot be said to be more influential among the four. But this result can show that the use of this combination can be said to be most effective than others. One of the factors causing the effect of Indonesian and Japanese narrative languages was that it has started to decrease the use of Japanese language among farmer group members. The use of realistic visual and silent visual that tend to be not much different or not significantly different as the process of shooting (silent visualisation) captures directly from realistic visualisation to ensure that the images presented are not much different from each other. This was done so that there was no striking difference in terms of content between the two messages.

Table 10 Result of Duncan's multiple range test

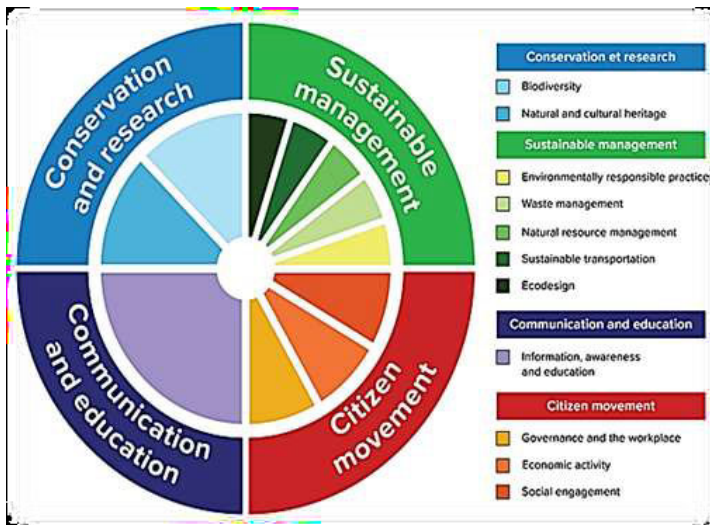
<i>Treatment</i>	<i>N</i>	<i>Subset for alpha = 0.5</i>
DS	20	13.55
DI	20	13.75
RS	20	14.55
RI	20	14.85
Sig.		0.262

Note: Information: average score of all treatments is not significantly different at $p: 0.05$.

Source: Cvijović et al. (2005)

Treatment of realistic visual and silent visual showed that it is not significantly different, which caused including message content being informative rather than instructional and members of farmer groups or respondents who were more open to media, accessed media frequently. This shows that the messages that are conveyed visually are better able to provide informative, attractive information because it has a sense of hearing and sight (Gambier and Gottlieb, 2001). If it is related to the respondent's characteristic factors, this study showed that all types of given treatments are very effective for farmer group members increase in knowledge in addition to the ownership and frequency of mass media exposure that had a major role in receiving information messages of cocoa pests.

Figure 1 Circular e-learning workware (see online version for colours)



Source: Gallico et al. (2011)

Figure 2 Circular e-learning in public (see online version for colours)



Source: Gallico et al. (2011)

3.7 *Online learning tools: technological solution*

Each student is provided with a username and password that allows entry into the internet platform dedicated to online degree and access to learning materials online and CD-ROM/DVD with instructional materials offline where established. The platform for each subject, a space dedicated to student's virtual classroom, consists of a diary online activities to be carried out during the week (sections of learning materials, online collaborative activities which participate in trials ongoing planned); a forum for discussion, requests for information, insights. A bulletin board for announcements of organisational type; a mailbox for the delivery of the exercises and deliverables required by the teacher; specific learning resources (exercises, supplementary materials, etc.). A virtual environment, where applicable, referred to as the live session that is activated in times and days specified for each subject, a system that integrates text chat with a virtual whiteboard systems for file sharing, and for 'guided tours' of internet sites, real-time tests, etc. (Gallico et al., 2011). To meet the needs of the University San Raffaele Roma's educational activities, MediaTouch technology partner of the university, has created a platform for distance learning, customising and integrating software components primarily of Open Source. The starting point for the delivery of e-learning Moodle, one of the most popular Open Source platforms in the world. Best known for its ergonomics, Moodle has been designed following the pedagogical theory of social constructivism, but it is very versatile for the large amount of available modules and highly customisable thanks to the availability of the source code. From this platform, MediaTouch has developed a comprehensive solution through the implementation of additional modules, customisations and integrations with other software components, in order to fully satisfy the demands of teachers and head teachers of University San Raffaele Roma, and to provide the while services related technical assistance (based trouble ticketing systems) and secretarial education. The system of distance education is supplemented by a set of high-level technological solutions for the implementation of the functionality of students' office.

3.8 *Knowing how (and why) the system works*

Learning in the field of design, that means learning to 'systemise' knowledge related to actors and other specialists, and to connect applications and organisational skills, and know-how (Horton and Horton, 2010). The multifaceted nature of design and connective requires that 'a school has in it many souls' providing students with a network of expertise and professionalism that fosters trans-disciplinary and allow them to build their own paths towards 'mending' languages and making disparate contributions. It is essential, of course, that such a school is a node in a larger network, which connects the actors in the design of its territorial system. The entire territory is a 'becoming school' for students, particularly those in a high-intensity relationship-driven design, as is the case in Milan. It is also important, as already noted, that the schools 'systemise' each other, to form a common front on issues of common interest. This does not always take place, but increasingly there are frequent actions that trigger a dynamic exchange between the centres of learning. These include cooperation projects at EU and global level, exchanges between students, international workshops, conferences and seminars, as well as scientific connections which match the forms of training and research design (Guralnick, 2008). Though they may become increasingly distant from self-referential logic, thanks

to the same rules of competition, the public and private schools will observe each other with interest, establish comparisons and references and qualitative models formed at national, European and intercontinental levels. Permanent links between international schools are established, which become the basis for access to the training market in a new country, forming systems whereby global networks can establish a relationship with territorial neighbourhoods.

3.9 Lifelong learning: knowledge towards specialisation

The progressive complexity of the social structure and the Italian production and global revival forms of craft-industrial production mixed with the new global division of labour, the emergence of ever new market related to the service and to mediate between people and businesses have also ensured the provision of training related to the design, as well as training in general (Gallico, 2007). The lifelong learning project aims to update and qualify designers, operators, employees, executives and managers on issues necessary to support the competitive development of the socio economic area (with particular reference to the peculiarities of their 'cluster'), can play an active and proactive role in the process of renovation and redesign of the 'new' local systems.

The professionals need to form a retraining to assess, develop, sell, convey the image of the design-oriented manufacturing sector (fashion design) in a 'cross' that combines pragmatism and imagination, managerial and planning in support of the markets and the development of skills for managing human resources. The proposed training will see the participation of persons who, at different organisational levels and in various industries and service, have expressed the need for upgrade and long life learning (Nutt, 2008).

The project has a specific vocation on the concepts of transversely and contamination. The trail is well able to provide both practical experience and knowledge of both project-specific case studies, with a multidisciplinary approach that combines pragmatism and imagination, managerial and planning skills.

The faculty is composed of academics, professionals and consultants with significant experience in the fields of planning, design, study and management, communication and marketing industry whereas a significant contribution by visiting professors from the international area.

3.10 Training professionals

Producing innovation through design has become vital and indispensable for the production system. In Italy, and Milan in particular, we have many of the most interesting cases of companies of fashion (apparel, accessories, jewellery) and design who were able to combine an efficient managerial with a creative entrepreneurship, innovation and design. The educational trail is able to provide both practical experience and knowledge of the project and specific 'case history'. The training course prefers a multidisciplinary approach that combines pragmatism and imagination, managerial and planning skills (Nutt, 2000, 2008).

The functional area of reference are product (and process), the industrial production, marketing, communication, retail, distribution and brand management. The Italian economic system is engaged in a major process of change to regain competitiveness and to respond to the challenges of the global economy. A process that has as a main

objective in productivity growth and, therefore, requires a strong investment in innovation of products, production processes, organisation and ultimately in human resources. It is a path faced by individual companies, but it is necessary that beside them there are institutions at national, regional and local know how to understand the meaning of the changes taking place, immediately adapting programs and operational strategies.

4 Conclusions

Learning design has a naturally strong link with industry and the job system, which in both cases testifies to many internship experiences (in university these experiences are mandatory) and which involves industries in their learning projects. These links are also verified by a wide range of exchanges, as explicated in a large number of competitions, workshops and joint projects. Creativity is involved from the bottom to top. Research into 'new' design is searching for new fields. Design is a conceptual project penetrating inside life, distorting all service enterprises. Life-design is the perception of which outcomes can arise from interpreting society's needs, especially interpreting what is suggested indirectly. It focuses itself on human beings, along with meetings, jobs, expectations, entertaining, learning and movement, projects for communities, social situations and living moments.

The question that this article has aimed to answer is whether a platform for e-learning can become a tool for the development of new models for creativity, design and innovation, transforming the concept of e-learning, and shifting towards the concepts of creativity learning, learning design and learning innovation. The experience described here suggests that this is what happens, generating new needs in terms of functionality of the platform, which must then be enriched with elements that encourage debate and the exchange of the community (collaborative innovation). In order to encourage creativity, design and innovation are not associated with the concept of randomness, but are part of a process and a method that is implemented in a dynamic way with the use of e-learning, producing a shift in the concept of e-learning. At last we can say that an e-learning platform is now very important to:

- promote and disseminate the culture of design, stimulating demand
- structure an offer of services to develop processes based on design innovation in enterprises, measured by their real needs
- encourage the use of services facilitating understanding and access
- promote the emergence of a new network of service companies in the field of design, a real infrastructure for operating in the territory of new knowledge, creating by young professionals coming from a large pool of specialised training that puts together a package of skills to support innovative business processes.

For the future the aim is to enhance used current strategies to facilitate educational content access to students with disabilities subtitling of video contributions. This feature also can also manage contents translated into different languages. In view of student's internationalisation therefore it will allow students to benefit from educational contents (initially developed only with Italian language).

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