

A national education policy-based ICT model for Indonesian vocational high schools (VHS)

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ABSTRACT: Various parties may dispute the government's readiness on implementing curriculum 2013. This illustrates that the previous and recent national education policy, teachers and school administrators have not been synergised. Therefore, a national education policy-based ICT model is proposed as a solution to increase the quality of school education, especially, at Indonesian vocational high schools (VHS). The research outcomes resulted from a study of the development of adaptive ICT model that is relevant to *Kemendikbud* policy, are as follows: 1) the result of initial testing shows that the ICT management at VHS Malang Raya is sufficient (54.63%); 2) the expert validation of the developed model illustrated that the research product is applicable (81%); and 3) average trainee response (88.8%) indicate that the technology is relevant for VHS stakeholders.

Keywords: Curriculum 2013, ICT-model for VHS, MGMP, stakeholders

INTRODUCTION

The rapid development of information and communication technology (ICT) creates a more convenient life in many countries. The ICT growth leads to a drastic improvement in terms of technology and quantity [1]. One success factor of ICT implementation is based on the characteristic of its users [2]. However, failures in ICT implementation are still heard about due to users' behavioural aspect [2].

In another study on the implementation of information systems, Adams et al explain that the application settings can be used by system designers to obtain user feedback as a step to diagnose any problems in the receipt of information by the user [3]. The specific-psychological behaviour within ICT users may influence the success of ICT implementation in various contexts, such as government and politics [4-6].

Andersen et al state that modern ICT may influence the government and politics through four approaches. Firstly, technology may change the detail of government's operational steps [7]. Secondly, technology may gradually transform the relationship between the elected leader and the technology experts in the government. Thirdly, the government characteristics as a source of public information resources may be transformed. Lastly, the development of technology may change the role of the government as the owner of the public information. In accordance with these matters, citizens may ask the government to be more transparent, to allow freedom of speech and the right to get information, which are known as the pillars of democracy.

The Indonesian Ministry of Education (Kemendikbud) responded to these phenomena through the strategic planning undertaken by the Department of National Education in the period 2005-2014. The Department formulates three pillars of national education public policies; which are: 1) access expansion; 2) the enhancement of quality, relevancy and competitiveness; and 3) the improvement of management, accountability and public image. The products of these policies were national networks for education and electronic versions of school textbooks, called *Jardiknas* (*Jaringan Pendidikan Nasional*) and *BSE* (*Buku Sekolah Elektronik*) respectively.

Both were created to answer related educational problems through ICT implementation. This is relevant to Miller's opinion that ICT-based education may generate inter-operable, reusable, manageable, accessible and sustainable learning processes [8].

In accordance with the following policies, the government has developed an organisation to improve teachers' professionalism, called *Musyawarah Guru Mata Pelajaran* (MGMP). However, the organisation has faced financial and technical difficulties since it was first established [9].

A recent government policy in education is the implementation of the 2013 curriculum. This educational policy improves the 2004 competency-based curriculum by the integration of attitude, knowledge and skills. This integrated curriculum has been developed to boost the performance of education by enhancement of learning efficiency and learning time at school.

In more detail, improved learning effectiveness can be achieved through three efficiency steps: interaction, comprehension and absorption. Here, the expected outcome is efficient school grades-transformation due to effective interaction between teachers and students in order to improve students' understanding. This curriculum promotes a learning approach and is based on personal experience through observation, association, asking question, making conclusion and performing communication.

In fact, the 2013 curriculum is still not equipped with supportive learning resources, for example, syllabi, teaching materials, scoring system, etc. The learning and teaching plan (RPP: *Rencana Pokok Pembelajaran*), shows that both technical coaching and improving ICT implementation in the curriculum are crucial.

Preliminary research reported that there has been a significant number of ICT implementations at vocational high schools (VHS) in the district that are still inappropriate to these pre-professional senior secondary schools' vision and mission. Based on that observation, research to develop an ICT model in VHS should be carried out. Here, the role of MGMP, particularly VHS-productive groups, should be enhanced. The developed model should be in-tune with the national education policy, especially, the implementation of the 2013 curriculum.

METHODOLOGY

This research uses a research and development (R&D) approach, is divided into two steps. The first stage relates to research and data collection for designing the ICT-model for VHS based on the existing management model. Figure 1 shows the model design based on the previous iteration. The design consists of policies and systems as inputs, users' satisfaction and model impacts. The second step tests the developed model at schools. The research procedures follow the 10 stages of the Borg and Gall method [10].

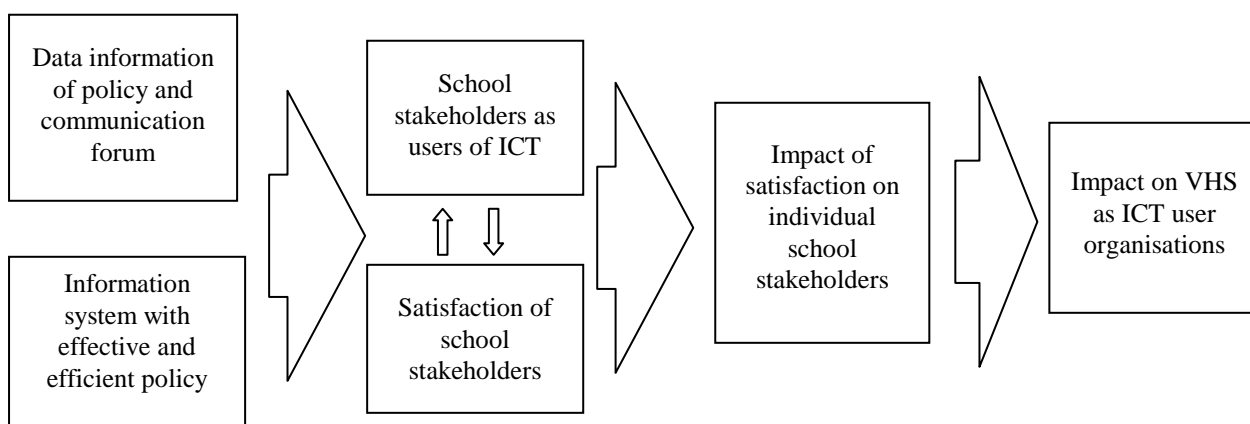


Figure 1: Conceptual models in research.

Additionally, the R&D approach consists of testing data, data analysis, product revision and final product-analysis. The testing data cover all data collection during the development and testing stages. On the other hand, data analysis examines the survey of the condition of ICT management at VHS in *Malang Raya* (City and District of Malang) and investigates the result of product testing. Product evaluation reveals the detail of product alterations. The final product analysis describes the model's strengths and its effectiveness.

Two approaches of the model testing were used: expert validation and field testing at VHS *Malang Raya*. The validation process involved experts in several subjects, such as ICT management and infrastructure, learning media and administration of vocational education. The respondents in the field testing comprised 50 people in four groups of ICT-VHS stakeholders: 10 administrators, 10 teachers, 10 students (grade XII) and 20 members of the MGM productive group of *MGMP Malang City*.

The data collection instruments included: a) a questionnaire about ICT condition at VHS *Malang Raya*; b) an expert validation questionnaire about ICT implementation model; and c) a questionnaire about model effectiveness on VHS stakeholders. Three data analysis techniques were used: feasibility analysis; instrument validity and reliability analysis; and model efficiency analysis.

The instrument's validity and reliability coefficient had to be obtained before distributing questionnaires to the research respondents. The questionnaire could be considered valid if the corrected item-total correlation score is less than 3.0 while the reliability coefficient at least 0.70 [11].

In this study, the calculation of both scores was obtained via SPSS 16.0 for Windows, which showed that the questionnaire was acceptable with 0.58-0.94 of corrected item-total correlation and 0.992 of alpha Cronbach coefficients.

RESULTS AND DISCUSSION

The survey results at VHS-*Teknik Komputer Jaringan* (TKJ) showed that the average of ICT management aspects was adequate (40-60%). The value indicated that the awareness of the importance of ICT infrastructures to support VHS TKJ at Malang Raya was excellent. Figure 2 shows the comparison between the average of various ICT management aspects of VHS TKJ from City and District of Malang.

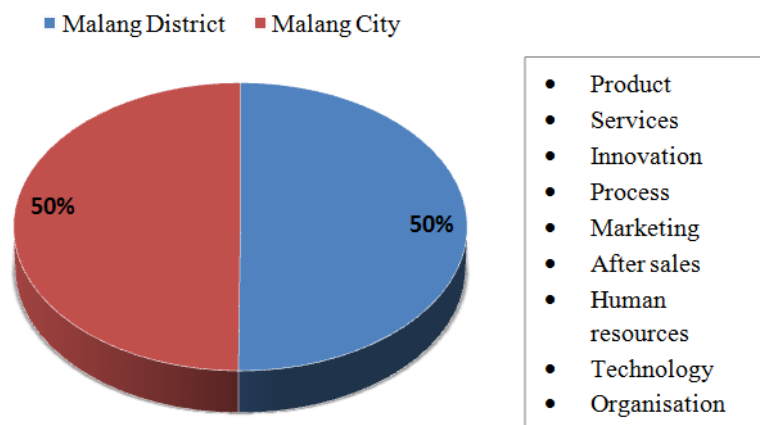


Figure 2: Comparison of ICT-management of VHS City and District of Malang.

Based on SWOT analysis, the survey result of ICT management at VHS TKJ Malang Raya could be divided into the three following factors:

- 1) Internal factors: a) Strengths (S): 1) the availability of novel and robust software and hardware; and 2) head of school commitment to provide sufficient budget for developing ICT at school; b) Weaknesses (W): 1) master plan of long-term development was unavailable; and 2) there was no synergy between the ICT development and management.
- 2) External factors: a) Opportunities (O): 1) demands for rapid and accurate information; 2) ICT training to improve human resources skill; and 3) the hardware and software should become public commodities; b) Threats (T): 1) uneven distribution of ICT experts in VHS technical units; 2) imbalanced ICT-distribution in every workgroup and technical unit; and 3) the appointment letter (SK) for ICT officers was not available.
- 3) Strategies from SWOT findings: a) Strengths - Opportunities: 1) optimise the use of hardware and software on information processing and distribution; and 2) optimise the budget for improving human resources' skills; b) Weaknesses-Opportunities: 1) improve the human resources' performance to maximise the ICT implementation; and 2) recruit more ICT officers; c) Strengths-Threats: 1) equal distribution of ICT on each department at school; 2) letter of assignment for ICT administrator; and 3) equal distribution of ICT-competent human resources on each technical unit at school; d) Weaknesses-Threats: 1) create a master plan as a reference of the decision making process; and 2) even distribution of ICT-infrastructure and experts.

The product should be assessed by experts in various disciplines, such as learning media, school management, ICT management and *Jardiknas* practitioners. Those experts should evaluate resource management, school management related to ICT organisation at VHS, and infrastructure management (hardware, software and users).

The researcher included the expert notes as part of the product evaluation of the model structure and an explanation of ICT implementation of the ICT management model in VHS. The average scores of the evaluations were 83.75% and 84.38%. This showed that the research product was valid for implementation.

The implementation of the developed ICT model is detailed in the following stages: a) various training for 50 teachers of MGMP-TKJ-VHS of Malang on using websites (Figure 3), recent curriculum concept (*Kurikulum 2013*), creating a teaching plan of a basic TKJ-competency; b) operational coaching on development and evaluation of the current RPP at school; and c) performance assessment for 50 stakeholders in Malang City.

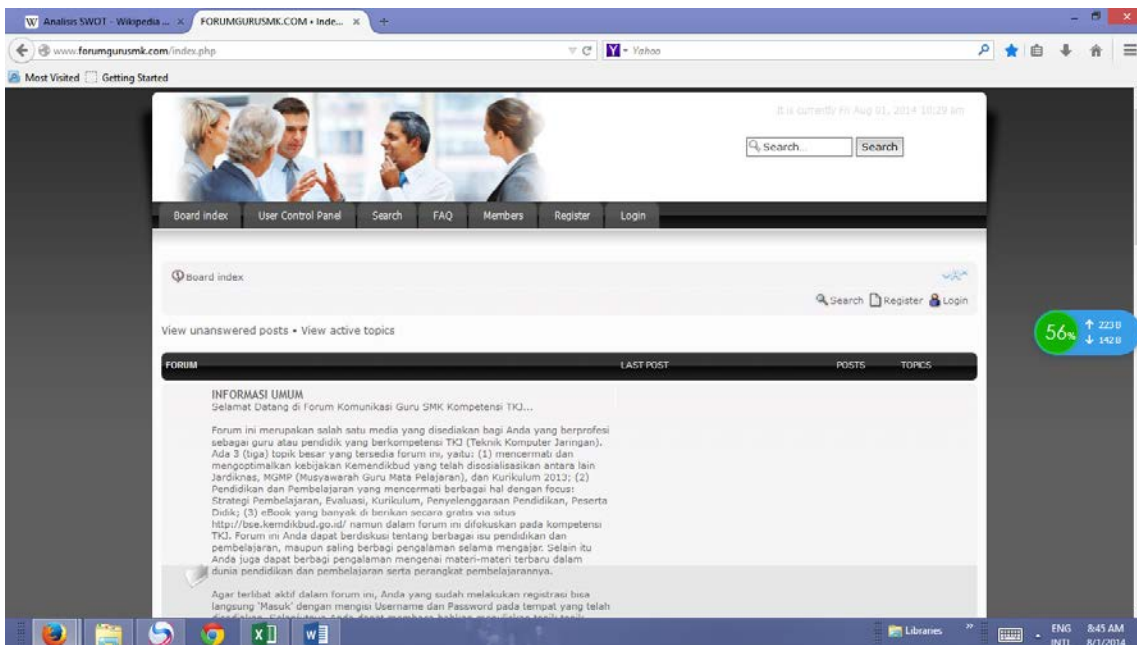


Figure 3: WEB of vocational teacher forums.

The participants' responses were divided into four groups: 1) three indicators of training goals on implementation of ICT model; 2) eight indicators of training materials; 3) four indicators of discussion topics; and 4) sole indicator of reference list.

The training participants were grouped into two categories, that is, administrators and teachers. The grouping is necessary since the implementation of *Kurikulum 2013* required synergy between teachers and administrators.

As shown in Figure 4, the administrators' (Adm) responses are higher than MGMP teachers in every aspect. They are more likely to know the subjects' objectives, materials, discussion materials and references as they indirectly manage the lesson according to the previous curriculum. The global average of four aspects (88.8 %) showed that the developed ICT model is a useful one.

Comparison of stakeholder satisfaction showed the improvement on understanding of Kemendikbud policy and using ICT efficiently. The number of WEB users (i.e. VHS teachers' forum) increased from 50 MGMP teachers to 785 participants with various educational backgrounds. The implementation result was in line with Gigler [12] dan Schreurs, J. [13] that information is not only a knowledge source, but also a special way to promote education, economy, social, politics and culture. In other words, access and the use of ICT is a basic condition of development in every life aspect.

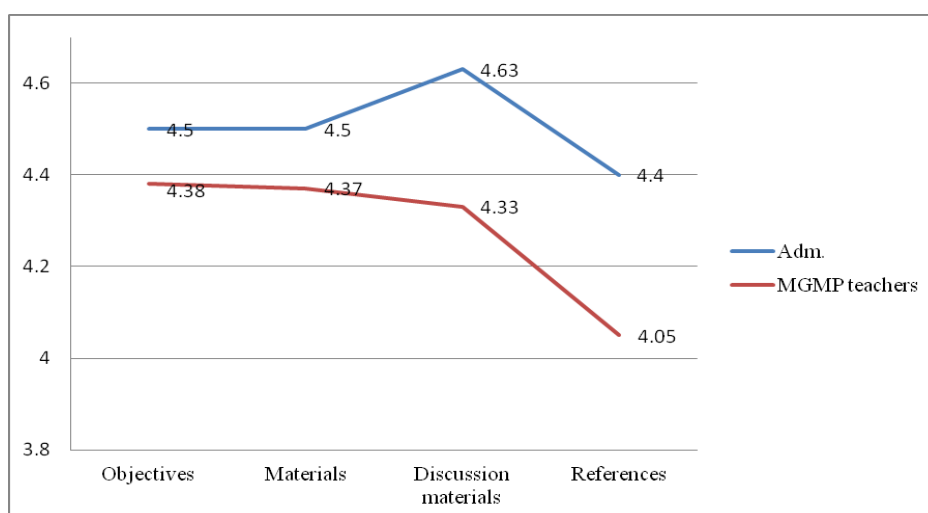


Figure 4: Comparison of the results of the model implementation - trainees average score.

CONCLUSIONS AND RECOMMENDATIONS

The research conclusions are described as follows:

1. The quality of ICT at 42 VHS Malang Raya is feasible (54.63%).

2. In general, the ICT management at those schools matches the VHS ICT management characteristics. The main obstacle is the lack of commitment and ability of the school policy makers, which may reduce the alignment of ICT management and *Kemendikbud* policy.
3. The expert validation of each evaluation aspects showed that the model implementation is practical (81%).
4. The limited trainees' responses on the product testing scale explain that the developed model is appropriate (88.8%).

The following suggestions have been formulated to increase the quality of future research:

1. The survey is not limited to VHS-TKJ due to the variety of vocational schools at Malang Raya.
2. Increase the number of respondents to perform more reliable research.
3. Develop training modules, which could increase the teachers' learning content, as well as the role of school production units.
4. Recommend that the school policy makers maintain and improve the leadership and organisational culture of school management staff to satisfy VHS stakeholders.

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BIOGRAPHY



Hakkun Elmunsyah was born in Bondowoso, but has been living in Malang, Indonesia. He was awarded a Bachelor degree in electronics from Brawijaya University in 1989. In 1999, he won a BPPS scholarship for a Master of engineering programme at University of Gajah Mada. Dr Elmunsyah received his doctoral degree from Yogyakarta State University with a dissertation on Management Models of ICT Centres at Vocational Schools (2008). He has been a senior lecturer in the Department of Electrical Engineering, State University of Malang (UM) since 1995. Since then, he has been appointed as the head of the UM Computer Centre (2003), Chairman of electronic journal developers, one of the Ministry of Education's curriculum instructors and a member of the graduate programme quality assurance group (2013).