EVALUATION OF THE CYBER RELIGIOUS EDUCATION MEDIA WITH PIECES FRAMEWORK

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ABSTRACT: The cyber religious education media can be used by the public to understand knowledge about cyber religious material which will be used for self-control when using the internet. Online internet education media can be accessed any time without being obstructed by space. It is hoped that the public can understand cyber religious material easily so that later it can become an alternative for self-control when using the internet properly, avoiding all things that are immoral or detrimental to others. Evaluation of the application of educational media using the PIECES framework, which consists of aspects such as Performance, Information, Control, Efficiency and Service, so that the application can be maximized is needed. The aspect of the main need that becomes a priority is to improve the efficiency of transferring cyber religious material to internet users.

KEY WORDS: *Evaluation, Application, Educational Media, Cyber religious, PIECES Framework*

1. INTRODUCTION

Information technology is growing rapidly, and everyone begins to use it as supporting equipment to help with various daily activities. Likewise, the role of information technology in the field of education is very useful to increase the effectiveness of activities and the efficiency of all parties. Based on the findings of Cyber Religious Research conducted by Danuri and Sulistiyo (2017), immoral behaviour of internet users tends to increase in line with how easy it is for everyone to access internet technology. This has an impact on the behaviour of internet users in their daily lives. From the above problems, it is necessary to have an application that can provide information and warnings to internet users when they use it. Preventive control is exercised by the users themselves through awareness on the internet with the concept of cyber religious. They use internet consciously for good and bad behaviour. This control needs to be supported by an application device that can provide information and warnings when they use it; this is done so that they are reminded of good behaviour. Cyber religion is a control model for internet users from the immoral actions of information technology users, which can be applied to various elements related to information technology. Cyber religion as a control model for internet users based on religion or individual belief in God has been accepted by society because it can have a positive influence on every individual who uses it. The need for information for the public about cyber religious material provides an opportunity to use digital technology in the form of online educational media. Online educational media packaging provides

convenience and speed in the process of transferring information at any time and is not limited by place and time. Cyber religious education media as a means of education has been able to increase the efficiency and effectiveness of learning for computer users and the community. To measure the Conformity of User Needs (CUN) with educational media, the system needs to be evaluated for its application so that aspects can be improved for the system to meet user needs. The evaluation of the application of this learning media uses the PIECES framework where this method will evaluate the suitability of the system with user needs from the aspects of performance, information, efficiency, control, economy, and service.

2. RESEARCH METHODOLOGY

2.1 Research sites

This research was conducted at AMIK JTC Semarang, Jl. Keludraya no. 19 Semarang.

2.2 Data collection technique

In this study, the authors conducted three ways of collecting data. This was done to complete the discussion; the following data collection techniques were carried out:

a. Interview

Interviews were conducted with users at the directorate level and the host campus management. This was done to obtain information related to the operational use of the online discussion information system.

b. Observation

To get a better picture of the operation of the information system on the Campus AMIK JTC Semarang, the authors made direct observations of the online discussion information system.

c. Questionnaire

Data collection was carried out by giving questionnaires to respondents from the student level, executors of information systems' operations, and top managers. The questionnaire is in the form of indicators in the PIECES framework that have been adapted to the research utility.

2.3 Sample Determination Technique

The method of determining the number of samples for the online discussion system research uses the Slovin method with an error tolerance of 5%. Determination of the number of research samples with an error rate of 5% (0.05) means that from 95% confidence (alpha 0.05) "there are at least 95 out of 100, the sample estimate will reflect the actual population". Below is the Slovin formula (Tullah & Iqbal, 2014).

$$\mathbf{n} = \frac{\mathbf{N}}{\mathbf{1+n}e^{\mathbf{2}}}$$

Where:
n: number of samples

N: total population
E: error tolerance

2.4 Data Processing Techniques

a. Validity test

Validity test is carried out to test the accuracy of a measuring instrument in carrying out its function so that the data obtained can be relevant or following the purpose of the measurement.

b. Reliability Test

Reliability test is a process of measuring the accuracy (consistency) of an instrument. This test is intended to ensure that the instrument used is an instrument that is reliable, consistent, stable, and dependent so that when used repeatedly, it can produce the same data.

c. Score Calculation

The calculation of the score from the data collected through a questionnaire is carried out to obtain an evaluation value for the application of the online discussion system with the score criteria for meeting user's needs (CUN) as follows:

i. 0.80 <CUN ≤ 1.00 the suitability of user needs is very high
ii. 0.60 <CUN ≤ 0.80 according to high user needs
iii. 0.40 <CUN ≤ 0.60 according to user needs is sufficient
iv. 0.20 <CUN ≤ 0.40 according to low user requirements
v. 0.00 <CUN ≤ 0.20 the suitability of user needs is very low

2.5 The Process of Implementing Educational Media

Cyber religious education media is a means of delivering cyber religious material to computer users and the wider community, this learning media is an alternative for more effective and efficient delivery of material and knowledge transfer processes (Danuri & Sulistiyo, 2017).

In Figure 1, you can see the process of implementing and evaluating online discussion starting from 1. implementation preparation activities which include survey activities, literature studies, preparation of system application requirements, and procurement. This activity aims to prepare materials used in system training and evaluation. 2. System evaluation stage I aims to evaluate the system for student users. 3. System evaluation stage II aims to evaluate the system for users at the directorate level and campus management. 4. Determination of the evaluation score, if the suitability value of user needs (CUN) is above 0.6 (60%) then the system is very much following user needs or the level of suitability of user needs is high.

2.6 Information System Performance Evaluation

Information systems evaluation activities can be carried out in different ways and at different levels, depending on the purpose of the evaluation (Riduwan, 2005).

Its purpose is to assess technical capabilities, operational implementation, and system utilization. Evaluation is carried out to define how well the system is running.

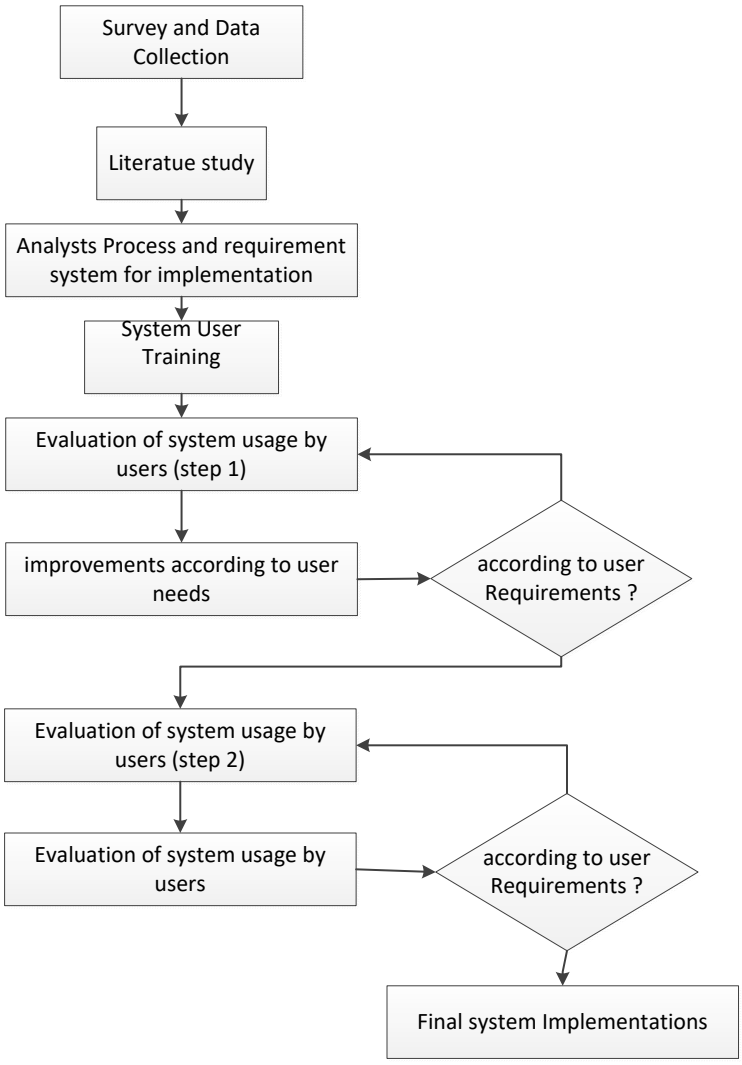

Figure 1: Process of Implementation and Evaluation of Educational Media

a. Meaning of evaluation

Evaluation is a process to provide information about the extent to which a certain activity has been achieved, how the achievement differs with certain standards to find out whether there is a difference between the two, and how the benefits that have been obtained compared to expectations.

b. The purpose of the evaluation of information systems

The objectives of the system evaluation include:

i. Assessing the technical capabilities of an information system.

ii. Assessing the success and failure of the operational implementation of information system.

2.7 Information Systems Evaluation Model

PIECES Framework is a framework used to classify a problem, opportunities, and directives contained in the scope definition section of system analysis and design. With this framework, new things can be generated that can be considered in system development. The PIECES method consists of six aspects, namely Performance, Information/data, Control/security, Efficiency, Service and Economic (Whitten & Bentley, 1989). Each of these categories can be further divided into several indicators.

Table 1: PIECES aspects and indicators

The PIECES Category	Indicator
1) Performance	a. throughput, where the system is judged by the amount of work done in several periods.
Performance is the system's ability to complete its tasks and functions quickly so that targets can be achieved immediately. Several indicators can show the performance of an information system, among others.	b. response time, namely the average delay between a transaction and the response of the transaction.
	c. audibility, that is conformity with which the standard can be checked.
2) Information	d. communication prevalence, which is the rate at which standard interfaces, protocols, and bandwidth are used.
Information is the output of the information system work. Good information has several criteria such as accurate, timely, and relevant as expected.	e. completeness, namely the degree to which the full implementation of the expected function is achieved.
3) Economic	f. consistency, namely the use of uniform design and documentation techniques throughout the software development project.

2.8 Success Factors in IT Application

Some of the factors that can support the success in implementing IT in a company (Burgess, 2002) are:

1) Owner / Manager involvement in IT implementation.
2) Involvement of users (employees) in construction and installation.
3) User training.
4) Selection of the selected application for computerization
5) Use of disciplinary planning methodology in establishing applications.
6) Number of analytical/strategic (versus transactional) applications executed
7) The level of IT expertise in the organization
8) The role of the external environment (especially consultants and vendors).

3. RESULTS AND DISCUSSION

3.1 User Data Observation Information System

a. User data at the student level from the Regular Class campus.

Table 2: User data at the Student level (Regular Class campus)

No	Unit / Part	Number of users
1	Students of Informatics Management Department	80 User
2	Students of Computerized Accounting Department	78 User
Total Students		158 User

b. User data at the student level from the non-regular campuses.

Table 3: User data at the Student level (Non-regular campuses)

No	Unit / Part	Number of users
1	Students of Informatics Management Department	135 User
2	Students of Computerized Accounting Department	125 User
Total Students		260 User

The total number of users is 158 + 260 = 418 users. The sampling method for student users is the Slovin method with an error tolerance of 5%. Number of Samples = 418 / 1+ (418 x 0.052) = 418 / 1,895 = 220.58, so the research would get 220 samples.

Table 4: Research Indicators and Variables

Aspect	Indicator	Operational definition	Category
Performance	Throughput	At least the output produced by the system	1. Very little, 2. A little, 3. A little bit, 4. A lot, 5. Very much
	Response time	The speed with which the system performs the work process	1. Very slow, 2. Slow, 3. Slightly fast, 4. Fast, 5. Very fast
	Audibility	Whether or not the work function is carried out by the system with the established standards	1. Incompatible, 2. Not appropriate,

Aspect	Indicator	Operational definition	Category
	Prevalence	Whether or not an interface is understood by the user	3. Somewhat appropriate, 4. In accordance, 5. Very suitable
	Communication		1. Very difficult to understand, 2. Difficult to understand, 3. Somewhat easy to understand,
		Whether or not the work function performed by the system is complete	4. Easy to understand, 5. Very easy to understand
	Completeness	Uniformity of use of design and documentation techniques on the system	1. Very incomplete, 2. Incomplete,
Information	Consistency	The least amount of damage that occurs when the system is wrong	3. Rather complete, 4. Complete, 5. Very complete
	Tolerance	Whether or not the communication process of the system is accurate	1. Very not uniform, 2. Not uniform, 3. Somewhat uniform, 4. Uniform,
	Error	Information Whether or not the information generated is appropriate?	5. Very uniform
		Is the display of information appropriate to your needs?	1. Very much, 2. A lot, 3. A little bit, 4. A little, 5. Very little
Economic	Accuracy		1. Not very thorough, 2. Not careful,
	Relevance	How easy is the data to be accessed/used?	3. Somewhat thorough, 4. Careful, 5. Very thorough
Control/ Security		At least the program can be reused in other applications	1. Incompatible, 2. Incompatible,
	Presentation	At least the resources needed in developing this system	3. Somewhat appropriate, 4. Suitable, 5. Very appropriate
Efficiency	Information	Appropriate access restrictions, which are used by the system to operators for certain programs	1. Incompatible, 2. Incompatible,
		Whether the existing system is safe or not to ensure data security	3. Somewhat appropriate, 4. Suitable, 5. Very appropriate

Aspect	Indicator	Operational definition	Category
Service	Flexibility		1. Very difficult, 2. Difficult, 3. Somewhat easy,
	Data	Whether or not the user attempts to learn and operate the system	4. Easy, 5. Very easy
	Reusability	Easy or not to find and correct errors in this system	1. Very little, 2. A little, 3. A little bit, 4. A lot, 5. Very much

3.2 Validity Test

The validity test is done by calculating the correlation of each question (item) with the total score. There are two techniques commonly used to test the validity, namely using the Corrected item-total Correlation. Validity testing is done with the help of a computer using the SPSS for Windows program. In this study, the validity test was carried out on 18 respondents. Decision making is based on a comparison of the value of r_{count} with r_{table}, where the value of r_{table} is 0.444 for df = 20; α= 0.05. Question items are said to be valid if $r_{count} > 0.444$, on the other hand, question items are said to be invalid if $r_{count} < 0.444$.

a. PIECES Variable Validity Test

The research variable questionnaire consists of 20 items/question items. The results of calculating the correlation for the score of each statement item with the total variable score can be seen in the following table.

Table 5: The results of the PIECES variable validity test

Grain	Corrected Item-Total Correlation	r_{tabel}	Status
3	,752	0,444	Valid
4	,852	0,444	Valid
5	,781	0,444	Valid
6	,852	0,444	Valid
7	,633	0,444	Valid
8	,738	0,444	Valid
9	,845	0,444	Valid
10	,666	0,444	Valid
11	,695	0,444	Valid
12	,911	0,444	Valid
13	,852	0,444	Valid
14	,911	0,444	Valid
15	,646	0,444	Valid
16	,538	0,444	Valid
17	,649	0,444	Valid
18	,480	0,444	Valid
19	,486	0,444	Valid
20	,615	0,444	Valid
Cronbanch's Alpha = ,994			

Source: Primary data processed, 2020

Based on Table 5 (Statistical Appendix), the results of testing the validity of the PIECES variable show that all items / question items have a Corrected Item-Total Correlation value or r_{count} greater than the r_{table} value (0.444), which means that the indicators are declared valid and can be used to measure the variable under study.

b. Reliability Test

The reliability test was conducted to determine the consistency of the variable measurement results. Reliability test is a criterion for the level of stability or consistency of a measuring instrument (questionnaire). A questionnaire can be said to be reliable if the measurement repeatedly can give the same results (provided that all conditions do not change). So, a questionnaire is called reliable if someone's answer to a question is consistent over time.

Furthermore, this reliability coefficient was consulted with the modified reliability degree criteria based on Arikunto's (2010) classification. The criteria for the magnitude of the reliability coefficient are as follows:

i. 0.80 <r11 ≤ 1.00 very high reliability
ii. 0.60 <r11 ≤ 0.80 high reliability
iii. 0.40 <r11 ≤ 0.60 reliability is sufficient
iv. 0.20 <r11 ≤ 0.40 low reliability
v. 0.00 <r11 ≤ 0.20 reliability is very low

The results of the reliability test on this research instrument can be seen in Table 6 below.

Table 6: Reliability Test Results

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,944	,956	18

Source: Primary data processed, 2020

Based on Table 6, the alpha value of the PIECES variable is above 0.9, which is classified as very high reliability. Based on the validity and reliability test, it can be concluded that the research questionnaire with the PIECES instrument is suitable for use as a research instrument.

3.3 Evaluation Results of the Online Discussion System Application with the PIECES Framework

The results of the questionnaire obtained evaluation data on the application of the online discussion system from all user levels as in Table 7 below:

Table 7: Data recapitulation of all aspects and all users

Indicator	Operational definition	Regular Morning Student	Regular Afternoon Student	Non-Regular Student	Average	Average of each aspect	Average of all aspect
Performance							
Throughput	At least the output produced by the system	70%	75%	75%	73%	77%	**77.60%**
Response time	The speed with which the system performs the work process	82%	75%	83%	80%		
Audibility	Whether or not the work function is carried out by the system with the established standards	80%	70%	78%	76%		
Common Communication	Whether or not an interface is understood by the user	83%	70%	83%	79%		
Completeness	Whether or not the work function performed by the system is complete	73%	80%	78%	77%		
Consistency	Uniformity of use of design and documentation techniques on the system	83%	70%	85%	79%		
Fault Tolerance	The least amount of damage that occurs when the system is wrong	73%	78%	80%	77%		
Information / Data							
Accuracy	Whether or not the communication process of this system is thorough	83%	75%	83%	80%	77%	
Relevance	Whether or not the information generated is appropriate	73%	80%	70%	74%		

Indicator	Operational definition	Regular Morning Student	Regular Afternoon Student	Non-Regular Student	Average	Average of each aspect	Average of all aspect
Presentation of Information	Is the display of information appropriate to your needs?	83%	70%	78%	77%		
Data Flexibility	How easy is the data to be accessed/used?	73%	80%	75%	76%		
Economic							
Reusability	At least the program can be reused in other applications	67%	75%	78%	73%	75%	
Resource	At least the resources needed in developing this system	78%	72%	80%	77%		
Control / Security							
Integrity	Appropriate access restrictions, which are used by the system to operators for certain programs	72%	85%	78%	78%	79%	
Security	Whether the existing system is safe or not to ensure data security	85%	75%	78%	79%		
Efficiency							
Usability	Whether or not the user attempts to learn and operate the system	78%	75%	80%	78%	79%	
Maintainability	Easy or not to find and correct errors in this system.	80%	85%	75%	80%		
Service							
Accuracy	Whether or not this system is involved in the work process	75%	85%	85%	82%	79%	

Indicator	Operational definition	Regular Morning Student	Regular Afternoon Student	Non-Regular Student	Average	Average of each aspect	Average of all aspect
Reliability	The trustworthiness of the existing system to perform the requested job.	85%	70%	68%	74%		
Simplicity	The difficulty of this system is understood by the user	77%	85%	78%	80%		

Source: Primary data processed, 2020

Based on Table 7, the results of the calculation of the PIECES aspect on average for each user according to user needs (CUN) have a score of 77.46%, this means that the Cyber Religious education media system has met the demands of all users. From the application of the system since 2019, it can also be seen that student users are enthusiastic about studying and understanding Cyber Religious material because it can be accessed easily and efficiently. The economic aspect has the lowest average score of 75.42%, which means that economically, it does not burden all users by carrying out Cyber Religious online learning activities. The highest score is in the Efficiency aspect with a score of 79.44%; this proves that this educational media provides time, energy and opportunity efficiency for all users to use it.

4. CONCLUSION

Evaluation of the application of Educational Media was carried out to determine the level of conformity of user needs to the delivery system of Cyber Religious material using the PIECES framework which includes aspects of Performance, Information / data, Control / security, Efficiency and Service. The number of research samples using the Slovin method was determined at 220. After evaluation was carried out to all users of educational media from students of various programs at AMIK JTC Semarang, it was found that the average value of the level of suitability of user needs for all aspects of PIECES was 77.46% which has the intention that the Cyber Religious education media system has fulfilled the needs of the users.

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