Information Literacy Instruction Model Development for Higher Education Library Instruction

Arman[1],*, Murni Winarsih[1], Nurdin Ibrahim[1]

[1] Department of Educational Technology, Postgraduate Program Universitas Negeri Jakarta, Jakarta, 13220, Indonesia

* Corresponding author: **armanamir_lpg@yahoo.co.id

Fostering students information literacy (IL) skills are frequently discussed among librarians and lecturers in higher education because they are a major prerequisite for academic society, and vital to academic success. This paper presents the formative evaluation for The A6S (analyse, select, search, sort, synthesise, share, and self-evaluation) information literacy instruction (ILI) model development, through a series of Tessmer's formative evaluation phases. This was carried out at the Islamic Science Faculty of Muhammadiyah University Lampung, Indonesia. The data were collected through checklists and questionnaires, and analysed both qualitatively and quantitatively. Based on the findings, the proposed ILI model was effective in improving students' IL skills and had a good appeal. Thus, the model can be implemented to this institution.

Keywords: *information literacy, formative evaluation, library instruction.*

1. Introduction

The information-rich environment brings a whole set of opportunities and challenges to both educators and learners. With the emergence of digital tools, students can retrieve and store the information needed to fulfill their academic assignments. On the other hand, there is abundant information raising questions about its authenticity, validity, and reliability [1]. However, learning in information-rich environments requires students to have the ability to manage information that is constantly changing. These skills are defined as IL, the ability to recognise when information is needed and the ability to locate, evaluate, and use effectively the needed information [2].

Recent studies indicated that high school students are not being adequately prepared to apply these skills for college-level learning. Students come to college without sufficient technology skills needed for academic success [3]. These students also lack sophisticated research skills to help them navigate resources that are available through university libraries[4], and the internet [5].

There is no doubt that ILI is important. Thus, to be accepted and useful, any library instruction program must be able to be evaluated in concrete terms. The study aims to improve a prototype of ILI model which was developed for the Islamic Science Faculty of Muhammadiyah University Lampung Indonesia library instruction through formative evaluation phases.

2. Theoretical background

The rise of the internet which offers low cost, ease of access and high speed to those who spend so much time seeking needed information, has extended the concept of traditional library instruction, which focuses on finding and using library materials to ILI, which denotes realms beyond the walls of a physical library[6].

IL is defined in a variety ways. The most widely cited is the ACRL definition of IL as "a set of abilities requiring individuals to recognise when information is needed and have the ability to locate, evaluate, and use effectively the needed information"[1]. The concept of IL is evolving in line with the rapid growth of technology and as new digital tools appear. Thus, in this paper,

we define IL as a combination of knowledge, attitudes and skills to identify, access, analyse, use, and communicate needed information in multiple formats from a wide variety sources.

Issues about fostering IL are frequently discussed among librarians and lecturers in higher education, because these skills form the basis for lifelong learning. It is common to all disciplines, to all learning environments [1], and are the major prerequisite for academic society[7], and vital to the academic success of college students [8]. In this context, preparing students with information literacy skills is crucial, as these skills literacy skills are the key to the students' success in higher education. This is also an answer to complaints raised that college graduates did not have the skills and abilities needed in the workplace [9]. Kavšek, Peklaj, & Žugelj recommended that it is very crucial for higher education institutions to deliver information literacy training which will enable students to use their newly acquired knowledge as soon as possible, in finding relevant information and evaluating the quality and usefulness of information resources, and using them to build new knowledge [10].

There are several models of ILI around the world (e.g. Big6, Plus, SCONUL, ACRL, etc.) which develop IL skills integrated into different subject curricula. These models are not suitable for higher education ILI. Thus, separate courses are needed for the development of students' IL skills[11]. Although instructional development has become an important topic, there is little evidence of instruction making any difference. The lack of systematic evaluation is an ongoing concern in instructional development literature[12]. Thus, any instructional development requires a judgment which is called formative evaluation, which is aimed at determining the strengths and weaknesses of instruction in its developing stages, for purposes of revising the instruction to improve its effectiveness and appeal [13].

3. Method

This study employed a mixed-methods approach using Tessmer's layers of formative evaluation[13] which involve: expert review, one-on-one evaluation, small group trial, and field trial. The expert review involved four experts from different fields: instructional design, subject matter, linguist, and media specialist. The one-on-one evaluation involved three students who represent low, middle, and high learning achievement. The small group trial

evaluation involved nine students and three instructors. While the field trial involved 30 students and three instructors. The data were collected through checklist, attitude questionnaire, pretest, and posttest. The data were derived from a checklist and attitude questionnaire we analysed qualitatively. The data from pretest and posttest were analysed quantitatively using statistical calculations.

4. Findings and Discussion

1. Findings

1.1. Expert review

An expert review was conducted to look over the instruction and to gain input from experts to revise the developed ILI model. The Expert review involves an instructional design expert, subject matter expert, printed-media specialist, and linguist. Several recommendations obtained from the experts' review as follow:

(1) Instructional design experts recommend the selection of appropriate information that makes it easier for students to understand.

(2) The subject matter expert recommended the need for consistency in using terms commonly used in the field of information literacy.

(3) The printed-media specialist recommended the selection of the more attractive typography on the cover, adjusting the colour for the cover with the characteristic of the module and consistency in the use of colours for typography.

(4) The linguists recommended improvements to some incomplete sentences, misspellings, and incorrect punctuation.

All of the experts' recommendations were used to improve the prototype to be validated at the next formative evaluation phase.

1.2. One-on-one evaluation

The one-on-one evaluation aimed to identify the 'obvious' errors in the instruction: poor grammar, misspellings, incorrect punctuation and unclear directions. The one-on-one evaluation involved three students that were representative of the target population with students of varying ability levels.

The one-on-one evaluation resulted in recommendations as follows: (a) adjusting the material and language with the cognitive level of the students, (b) improving the self-module layout and colouring, and (c) providing graphics, tables, and examples and non-examples that makes it easier for students to understand the instructional materials.

1.3. Small group trial

The small group trial aimed to determine the effectiveness of changes made following the one-on-one evaluation and identify any remaining learning problems that learners may have. The small group trial involved three instructors and nine students that were representative of the target population with students of varying ability levels. The students were given pretests and posttests to determine the effectiveness of the ILI model develop, while an attitude questionnaire was given to determine the instructor's and students' perceptions of the model relating to motivational aspects (attention, relevance, self-confidence and satisfaction).

Paired Sample t-tests were conducted to examine the differences between the pretest and posttest mean scores. Based on The SPSS Statistics calculation, it was found that there were significant differences between the two groups (table 1).

Table 1. The paired sample test tables for the small group trial

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Postest	-13.61111	4.52616	1.50872	-17.09022	-10.13200	-9.022	8	.000

Table 1 shows that the p-value is less than the alpha level (0.000< 0.05). it can be concluded that there was a statistically significant difference between pretest and posttest mean. Next, the calculation of t-value (-9.022) using Cohen eta squared formula showed that the developed ILI model had a strong effect to students' information literacy (0.74>0.5).

Based on student and instructor responses through attitude questionnaires, that were given at the end of instruction, it was found that both students and instructors had good perceptions of the developed ILI model, on the level of attention, level of relevance, level of confidence and level of satisfaction (figure 1).
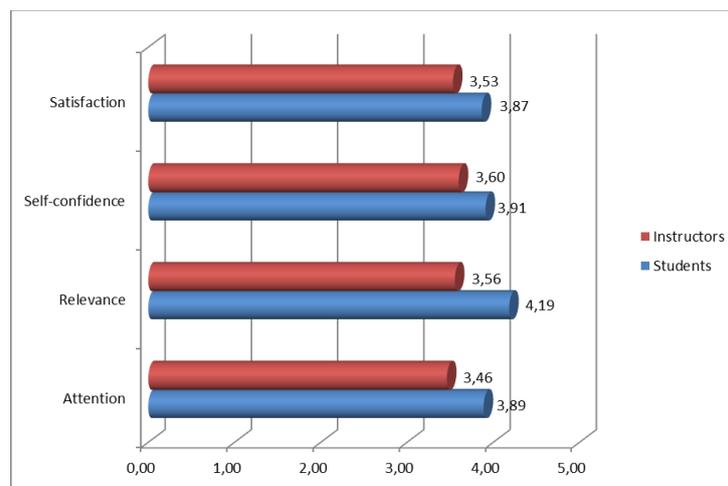

Figure 1.   Perceptions on the The A6S ILI Model (small group trial)

1.4. Field trial

The field trial aimed to confirm the revisions made in the previous evaluation phase and to determine the effectiveness of the instruction. The small group trial involved 3 instructors and 30 students. As in the small group trial, the students were given pretests and posttests to investigate the effectiveness of the ILI model developed, while an attitude questionnaire was given to investigate the instructor's and students' level of motivational aspect.

Paired Sample t-tests were conducted to examine the differences between the pretest and posttest mean scores. Based on The SPSS Statistics calculation, it was found that there were significant differences between the two groups (table 2).

Table 2. The paired samples test table for field trial

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Pretest - Postest	-12.58 333	2.82 258	.515 33	-13.63 730	-11.52 936	-24. 418	29	.000

The table 2 shows that the p-value is less than the alpha level (0.000< 0.05). It can be concluded that there was a statistically significant difference between pretest and posttest mean. Next, the calculation of t-value (-24.418) using Cohen eta squared formula showed that the ILI model developed had a strong effect to students' information literacy (0.95>0.5).

Based on student and instructor responses through attitude questionnaires that were given at the end of instruction, it was found that both students and instructors had good perceptions of

the developed ILI model on the level of attention, level of relevance, level of confidence, and level of satisfaction (figure 2).
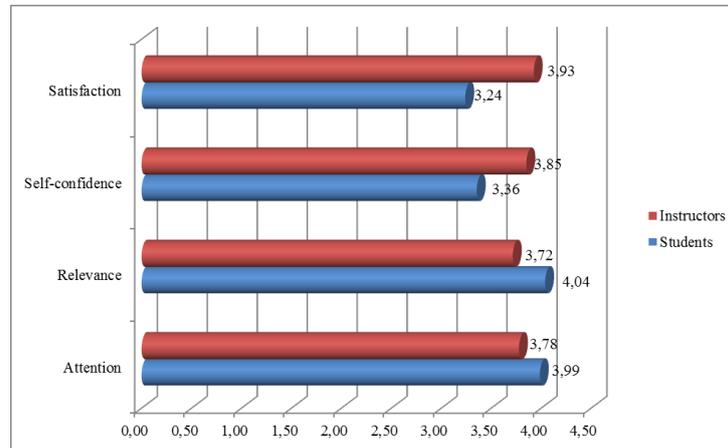

Figure 2.   Perceptions on the The A6S ILI Model (field trial)

2. Discussion

The A6S model is grounded in contemporary theories of learning, instruction, and andragogy and is developed based on instructional design principles. The seven components of A6S provide students' IL competencies standard for higher education. At the analysis stage, students learn the basic beginning of the inquiry process, i.e. identifying, selecting and formulating research topics, problems, purposes, and questions, and develop an outline to guide the research process. At the next stage, select students are taught to understand the difference of sources of information and to determine where the sources are, and the right tools and strategies to find them effectively and efficiently. At the search stage, students practice applying the right tools and techniques to retrieve the information needed both from the library and internet. The sort stage equipped students to decide the feasibility of the information sources by evaluating the authority, objectivity, relevance, completeness, timeliness, and accessibility of the information sources. At the two next stages, synthesise and share, students learn to build their own new knowledge through extracting, organising, analysing and synthesising, and to use and present them in various formats in an ethical and legal manner. The most crucial component of the A6S

IL instruction model is the self-evaluation stage, where students are encouraged to develop their critical thinking, reflection, and metacognitive skills throughout the inquiry process.

The A6S IL instruction prototype has been judged, validated, and revised through a series of formative evaluation phases. The formative evaluation data indicated that the proposed model information literacy instructional model was effective in improving student information literacy skills, and enhancing students' and instructor's motivational aspects (attention, relevance, confidence, and satisfaction.

The biggest obstacle for the first year students in learning is that they have to be able to adapt quickly to new environments, new learning systems and new technologies [14]. Technical support should be provided to them with knowledge and skills of these new attributes. According to Hess and Kraemer, instructional design principles can provide libraries and librarians with direction for future instructional initiatives[15]. Based on the findings, the A6S ILI model was effective in improving students' IL and can be implemented to the institution.

5. Conclusion

ILI is very crucial to equip students with the ability to find relevant information and evaluate the quality and usefulness of resources in the rich-information environment. In order to be accepted and useful, any library instruction development should be required to involve formative evaluation, and to determine the strengths and weaknesses of instruction in its developing stages. This is for the purpose of revising the instruction to improve its effectiveness and appeal.

The findings indicate that: (1) The A6S ILI model was effective in enhancing students' IL skills, and (2) both students and instructors had good perceptions on the A6S ILI model's appeal (attention, relevance, self-confidence, and satisfaction). Thus, the model can be implemented to the institution.

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