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Measuring the Reliability Analysis of Heutagogy Learning, Student Motivation and Digital Literacy among Indonesian Students †

Endang Fitriyah Mannan [1,2,*], Shamila Mohamed Shuhidan [1] and Mohamad Noorman Masrek [1]

[1] Faculty of Information Management, Universiti Teknologi Mara Selangor Branch, Shah Alam 40150, Malaysia
[2] Faculty of Vocational Studies, Universitas Airlangga, Surabaya 60286, Indonesia
* Correspondence: endang.mannan@vokasi.unair.ac.id
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Abstract: This paper's aim was to measure the reliability of heutagogy learning, student motivation, and digital literacy among Indonesian students. This study used a quantitative approach. Respondents are secondary school students in Indonesia. Data were collected using a questionnaire. The instruments that were compiled were also reviewed by experts. A pilot study was also conducted and followed by 54 respondents. The data were processed using SPSS. The findings revealed the instrument was reliable and there were no abnormalities in the data with the highest value of 0.917 and the lowest value of 0.720. It means that the questionnaire can be used for data collection

Keywords: heutagogy learning; student motivation; digital literacy; Indonesian student

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1. Introduction

The Information and communication technology (ICT) has changed the world, including in the education method [1]. Technology advancement and expansion translate into increased educational access via devices used to deliver distance and online education. The ICT has also shifted traditional methods of teaching and learning to a new method and experience. This means that the new method allows teachers and students to explore more resources in a more flexible manner. However, not all teachers and students can use all the information available on ICT. In addition, to adopt ICT as an innovative teaching and learning practice, the education system must be transformed. The current form of education is heutagogy, which is focused on self-determined learning [2]. Heutagogy requires students to be more independent learners, and the role of the teachers is only as a guidance and the students have the freedom to set their own learning experience [3]. In addition, [4] stated heutagogy is relevant to the needs of learners in the 21st-century, particularly in the development of individual capability. Therefore, to cope with the current situation, the student needs to equip with digital literacy skills.

Studies have found that there is a relationship between digital literacy and student motivation [5–7]. Student motivation is critical in fostering a desire to begin engaging in and pursuing educational goals [8]. Moreover, [9] as cited by [3] found that students will have motivation if their teachers allowed them to find their way for study. Students must be free to choose their course or topic that is related to their interests. For example, students can utilize technology such as the internet as a facilitator for studying. The freedom method of study allows a student to expand not only their experience but also their knowledge in certain areas and fields of interest. Then, students show their highest confidence and motivation to search the topics in which they are interested.

2. Problem Statement

The heutagogy approach is still new and not all schools in Indonesia have implemented it. A prior study argued that heutagogy promotes students to reflect on daily unstructured

experiences of learning [10]. Furthermore, in the heutagogy method, students and teachers have the opportunity and freedom to choose, utilize, and gain from many resources of information regarding problems in the school [2,11]. In the digital age, students must have adequate literacy skills. Literacy in Indonesia remains low in comparison to other countries [12]. As a result, digital literacy is essential as part of 21st-century education [13]. Finally, the implementation of digital literacy necessitates the collaboration of various parties, including the government, schools, parents, and society [14]. Digital literacy education for the millennial generation is necessary. According to [4] who stated that "the internet usage of primary school children found that the experiences, knowledge, familiarity, motivation and proffer guidance in literacy skill will help them to improve their learning experience". Therefore, an understanding of digital literacy skills is required in the heutagogy method to improve student motivation.

3. Literature Review

Previous studies [10,11,15–18] have shown that the heutagogy learning approach is to prepare the students to be self-determined and that it requires a new skillset specially to deal with complex information age. This section will discuss the literature review on heutagogy, digital literacy, and student motivation. The way of teaching and learning is continually experiencing changes simultaneous with the development of the country's vision of creating younger generations that are occupied with facing new challenges in the era of globalization. Heutagogy methods addressing the self-directed learning needs of the autonomous professional learner include distance learning and the use of technologies. The Pedagogy-Andragogy-Heutagogy (PAH) continuum was developed to help understand the learning processes that may increase learner agency as the learner develops new learning skills.

Today the topic of digital literacy is widely discussed in this era. Students and teachers are raised in social knowledge. Being advanced digital literacy is an existing skill that needs computerized education abilities in each part of their life. To be educated in the modern sense, it is essential to be digitally literate [15,16]. According to the previous study, digital literacy is the use of digital devices to establish meaning and communicate effectively with some accessories such as digital texts, navigate non-linear digital documents, and evaluate digital information [15,19,20]. In addition, [21] defined digital literacy as the use of computers as accessible and productive devices to collect, build, transform, and securely use information. Furthermore, Information Communication and Technology (ICT) and Digital Literacy (DL) are pre-mandatory of the digital world. Consequently, it can be concluded that technological devices can enhance student motivation and attitude and the DL of students.

Motivation can affect how students approach school in general. Student learning motivation must be a serious concern in developing 21st-century skills. The learning environment needs to be developed in such a way as to make it more interesting so that learning does not merely transmit knowledge ('standard transmission'). Increased involvement in and control over the learning process by the learner; self-initiated learning; the opportunity to develop and share patterns; and its significance [10,22] argued that "being digitally literate today involves the knowledge, attitudes, and skills needed for operating technologies, using the internet, understanding the media, and managing information. However, the convergence of literacies into the digital is, however, more than the sum of its single elements". According to the study findings, a student's technological skill is a significant predictor of attitudes toward ICT. This attitude has the potential to influence student's perceived and actual DL and ICT skills. Better ICT skills are thought to improve student's motivation and attitude. Thus, a better DL improves positive attitude towards technology.

From the underpinning theories and models of Heutagogy Learning, Digital Literacy and Student Motivation are derived the research framework as shown in Figure 1. The proposed framework aims to investigate the relationship between heutagogy learning and student motivation. The independent variable in this study is Heutagogy learning

which has four (4) dimensions, namely linear agency, capability, reflection, and non-linear design which will be considered to have an influence on student learning motivation which includes dimensions of attention, confidence, and satisfaction. An important addition to the framework is digital literacy skills which are expected to be strongly correlated with the use of electronic resources among students. Thus, Digital literacy skills have been identified as a moderating variable, with the introduction of which the effect of the four (4) dimensions on the independent variable is expected to be strengthened. It is predicted that the dependent variable will have a relationship with the independent and moderating variables mentioned above.

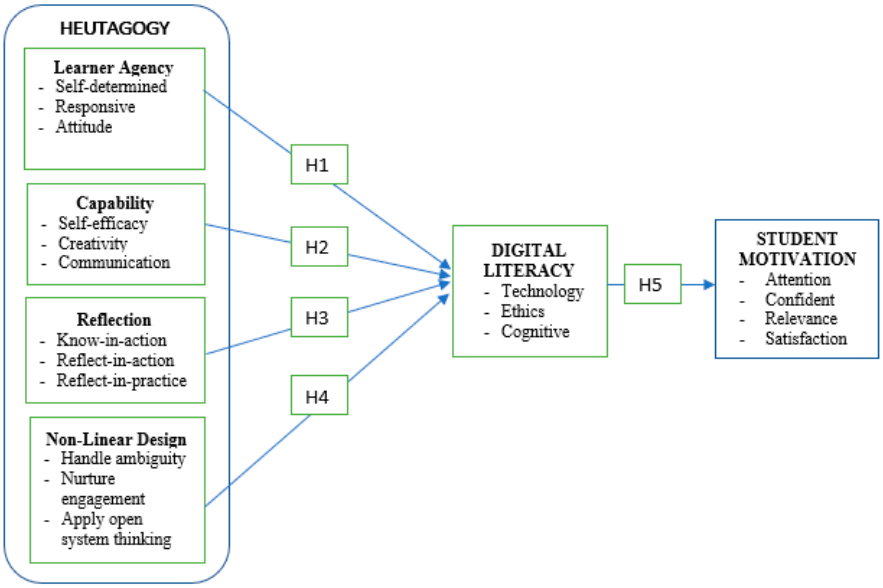

Figure 1. Research Framework.

4. Methodology

The questionnaire was constructed by adapting and adopting various literature to obtain the perspectives of students in senior high schools in East Java, Indonesia, on the research topic. A total of 87 question items were successfully constructed which were previously reviewed by experts consisting of academics and practitioners. Feedback from the experts was used to improve the questionnaire in the hope that students as respondents can understand the questions. Several points were raised, including the need for more precise words and verbs to increase the clarity of the questions and the inclusion of examples to help respondents understand the questions. After that, a trial was conducted to verify that the respondents understood the questionnaire items and that there were no ambiguous questions. Data from this preliminary study, consisting of 54 respondents, were analyzed using SPSS version 26.

5. Pre-Testing Validity and Reliability of Research Instrument

A pilot test will provide meaningful findings that help researchers identify appropriate variables for further exploration. Thus, the results of this preliminary study help researchers determine the research instrument's validity and reliability. The sampling method for this research was simple random sampling. In this research, the method used was purposive random sampling because the elements in the population had several known possibilities of being selected as sample subjects. The survey items were distributed to five experts in digital literacy in education in Indonesia: lecturers in the Library and Information Science, school supervisors and teachers. All these reviews are constructive for the researcher to complete the questionnaires with appropriate modifications.

The survey questionnaire structure begins with part 1: Demographic profile consisting of nine queries. The survey questions are classified into four sections with closed question

types. In Sections 2–4, a questionnaire consisting of 87 questions focused on the independent and dependent variables of the study. All units used a five Likert scale ranging from "strongly agree" (coded 5) to "strongly disagree" (coded 1). The schools selected for this research have Semester Credit System (SKS) services, where the characteristics of the school are like the study.

6. Reliability Test Results

Table 1 shows that Cronbach's alpha was used to determine the scale's reliability and internal consistency in this study. Cronbach's alpha values for all factors were greater than 0.6, indicating that the level of reliability was appropriate and acceptable. According to the results of the SPSS analysis, the overall consistency, or Cronbach's Alpha value, of all 87 items for each dimension contained in the instrument was between 0.764 and 0.940. In the technology dimension, the Solution Common Technical section shows the highest value of 0.940, while the Problems Apply open system thinking measurement offers the lowest value with 0.764. The lowest value was still above 0.6, so all questionnaires can be used. These results imply that, particularly at this point of the investigation, the overall index of internal consistency of the scale in the instrument is reliable without any unexpected abnormalities found in the data.

Table 1. Hypotheses.

	Hypothesis
H1	Learner agency has relationship with digital literacy.
H2	Capability has relationship with digital literacy
H3	Self-reflection has relationship with digital literacy
H4	Non-linear learning design has relationship with digital literacy
H5	Digital Literacy has relationship with student motivation
H6	Digital literacy has mediated the relationship between heutagogy learning and student motivation

According to [23] a Cronbach's alpha value of less than 0.6 will have an impact on the data validity. Therefore, the items need to be revised or omitted as items. One approach to improving Cronbach's alpha value is adding more related articles to test the same concept. The Table 2 shows the reliability of the test results. It has been carried out with 30 students, and the results of the tests are as follows:

Table 2. Reliability of the Test Results.

Variables		**Number of Items**	**Cronbach's Alpha**
Learner Agency	Self-determined	5	0.896
	Responsive	4	0.787
	Attitude	5	0.917
Capability	Self-efficacy	4	0.720
	Creativity	4	0.814
	Communicate	5	0.835

Table 2. *Cont.*

Variables		Number of Items	Cronbach's Alpha
Reflection	Know-in-action	4	0.747
	Reflect-in-action	4	0.783
	Reflect-in-practice	4	0.834
Non-linear Design	Ability to Handle ambiguity	4	0.799
	Nurture engagement	5	0.813
	Apply open system thinking	4	0.775
Student Motivation	Attention	5	0.856
	Relevance	6	0.787
	Confident	4	0.803
	Satisfaction	5	0.793
Digital Literacy	Technology	4	0.829
	Ethics	6	0.813
	Cognitive	5	0.839
Overall		87	0.813

7. Discussion & Conclusions

The Research framework was expected to provide useful and insightful results regarding the relationship between heutagogy learning and student motivation. Furthermore, digital literacy skills are a moderating variable that was expected to influence both the dependent and the independent variable's relationships. All these variables will be measured in a study with 54 students in the pilot test. Before the actual investigation, the instrument was initially pre-tested to identify possible problems and determine the level of understanding of the items. Five experts reviewed the instrument and provided meaningful feedback. The results of the collected data indicate that the overall index of internal consistency of the scale in the instrument is reliable, with no unexpected abnormalities found in the data. The pilot results show that the overall consistency, or Cronbach's Alpha value, of all 87 items for each dimension contained in the instrument was between 0.720 and 0.917. In the attitude dimension on the variable learner agency shows the highest value of 0.917, while the self-efficacy dimension on the variable capability measurement offers the lowest value with 0.764. All factors have a value greater than 0.6, indicating that all questions in the questionnaire can be used for data collection [24]. The instruments will be used for the next phase of the study and hopefully, they will contribute to the improvement and implementation of heutagogy learning emphasis on a digital literacy case study in Indonesia. It can assist teachers in preparing digital literacy skill in heutagogy learning to enhance student motivation.

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