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**“OnLaing” a distance learning management information system platform
with heutagogy approach in Industrial Revolution 4.0: A Design**

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ABSTRACT

The purpose of this study was to design distance learning platform using heutagogy approach. This study is expected to help to improve the quality of student learning outcomes and to motivate students to learn. This type of research is the development of research, known as research and development (R&D). The design of this study adapting by the SDLC model. The aim of this study is to design an online platform in Industrial Revolution 4.0 using Heutagogy Approach. The design will use the website programming namely PHP and MySQL as databases. Result of this study: the design and development of distance learning platform using heutagogy approach can improve the effectiveness of the learning process and the use of online learning will be a new method/approach of learning systems in the industrial revolution 4.0. Acceptance of distance learning is also important because this acceptance can provide benefits for the development of education. This is supported by the result of questionnaire which states that >75% of users are interested in using this system.

Keywords: Heutagogy, online learning, distance learning.

1. Introduction

At present the world has entered the era of the Industrial Revolution 4.0 (RI4), an era in which everything is associated with technology. This RI4 era prioritizes work automation using technology, such as the use of the Internet of Things (IoT). The fourth industrial revolution (4.0) or can be referred to as the digital revolution provides a very attractive offer for education, especially relating to access to a variety of information and services to share a variety of information quickly almost anywhere, anywhere and anytime. This RI4 era will affect the way of learning and the learning process. To undergo this era, education needs to be directed to keep abreast of the times (RI4). Based on the study of Rusli, et. al [1], there are 75% of students of FMIPA UNM (Indonesia) agree with the use of online learning.

Ease of access and share a variety of information indirectly provide a very attractive offer to the ease of the application of heutagogy learning (self-

determined learning) which is already offered since more than a decade ago. Heutagogy offers the freedom to learners to determine their own learning. It covers content that will be studied, learning strategies that will be used and the types of assessment that will be used, as described by Hase & Kenyon [2] that "...the essence of heutagogy is that in some learning situations, the focus should be on what and how the learner wants to learn, not on what is to be taught...". So that the core of the heutagogy learning is giving freedom to learners to determine their own system of learning and ways of learning.

Heutagogy offers active collaboration (double hands) to determine learning, including what content is appropriate for learning, how to learn it and how the form of assessment will be used to prove that a competency has been successfully mastered well. Learners and teachers exchange ideas about what is appropriate for learners to learn and how to teach them or what learning steps and learning resources are used to achieve the specified learning goals. In other words, the learner's position is more as a facilitator or learning consultant. One that can connect between teachers and students by using video [3][4].

In heutagogy, a teacher/lecturer is a private consultant in the learning process of learners. Lecturer and learners to exchange ideas about what is suitable for learners learn from the steps that must be done by the learners to the objectives to be obtained by learners.

2. Heutagogy

Heutagogy is an approach that supports the theory that intuition is an integral part of the learning process, which refers to the reflective learning and double-loop [5].

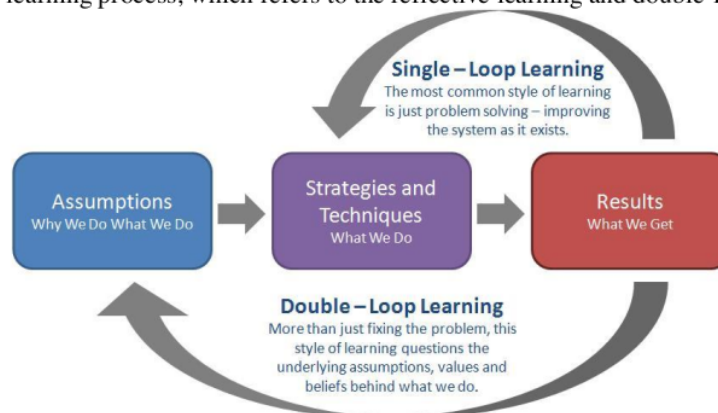


Fig. 1 Double-loop learning [5]

Correspondingly, Bhoyrub, Hurley, Neilson, Ramsay, & Smith; Rathakrishnan & Raman; Snowden & Halsall [6]–[8] stated that heutagogy approach is an approach that is in accordance with the challenges that allow a development to cope with the

rapid changes occurring in recent times. Furthermore, Snowden & Halsall [6] suggested that there are two keys of collaborative strategies that support heutagogy approach: (1) solution focused on teaching and learning, and (2) study conducted by mentoring.

Chacko [9] stated that heutagogy approach is the most effective learning approach when applied to “mature” students which has been professionally qualified to have self-motivation and determination to enhance their capabilities for the challenges and complexities in the future. Heutagogy needs to be seen as an extension of the theory of andragogy learning that in line with the transition into higher education that directs students to become competent shifting of competence to ability.

Table 1. The different of pedagogy, andragogy, and heutagogy [10]

	Pedagogy	Andragogy	Heutagogy
Learning	Instructor-Directed Learning	Self-Directed Learning	Self-Determined Learning
Focus	Knowledge-Focused	Instructor-Learner Coordinated	Process-Focused
Power and Control	Instructor-Directed	Instructor-Learner Coordinated	Learner-directed
Learning	Single-Loop Learning (goals and rules)	Double-Loop Learning (modification)	Spiral-Loop Learning (transformation) Holistic Learning
Learning Design	Linear Learning Design (modular)	Cyclical Learning Design (spiral)	Design (mastery and trustworthiness)
Development	Knowledge Development	Competency Development	Capability Development

3. Method

This type of research is the development of research, known as research and development (R&D) and questionnaires. The design of this study adapting by SDLC prototype model. There are four stepwise of prototype method of SDLC: (1) Basic requirement identification; (2) Developing the initial prototype; (3) review of the prototype; (4) Revise and enhance the prototype. The design will use the website programming namely PHP and MySQL as databases. The result of this design will be tested accessible through several platforms e.g. Android, iPhone, etc. The questionnaire in this study is intended to look at how far the prototype was accepted by users.

4. Result and Discussion

The design of this online learning using the software development life cycle (SDLC) process with prototype model. There are four stepwise of prototype method of SDLC: (1) Basic Requirement Identification; (2) Developing the initial Prototype; (3) Review of the Prototype; (4) Revise and enhance the Prototype.

The initial design of the prototype can be seen in Fig. 2, Fig. 3, Fig. 4, and Fig. 5. The first design is the main dashboard (Fig. 2).

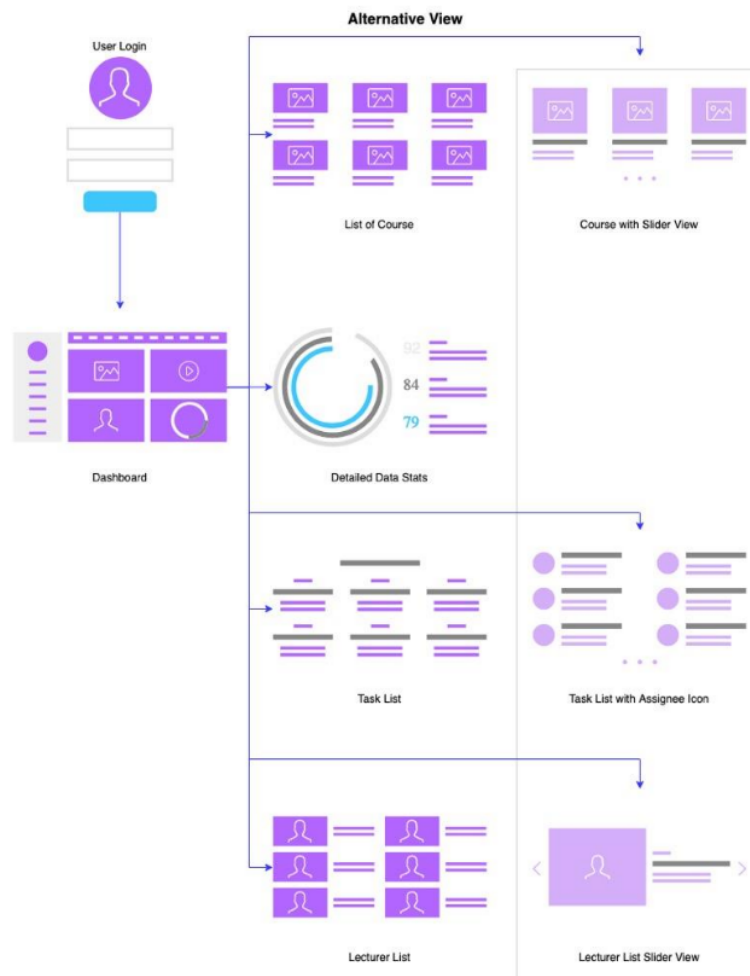


Fig. 2 The full prototype design of online learning

Fig. 1 shows the steps to run the system. First, the user (students) login using the username and password, if the login is successfully, then the user will be show the user dashboard. In the dashboard, the user can be see the course that can see the courses offered or can be selected or taken. On the dashboard too, the user can see detail of the their statistics data (their course), see the task lisk of course, the list of lecturer, and the user can view their profile.

The next design is the profile dashboard of user (Fig. 3). In the phase, user can see the list of their course. This design not similarity with the dashboard phase. The main dashboard show all of courses offered and the profile dashboard only show course of user, list of examination, list of result of examination. If examination of user is failed, their can request remedial examination to the lecturer.

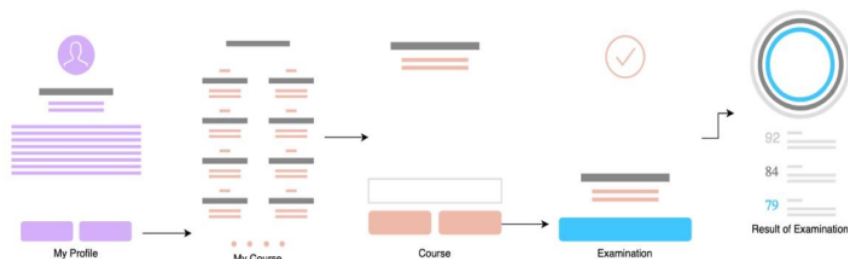


Fig. 3 The design of profile dashboard

The next design is updating the user profile (Fig. 4). The phase, user can edit their profil, for example, they can change password, update profile image, and others profile. In this phase, the user can't change their email because email is the key difference with other users. So at the time of initial registration a valid email is needed because a verification code will be sent.

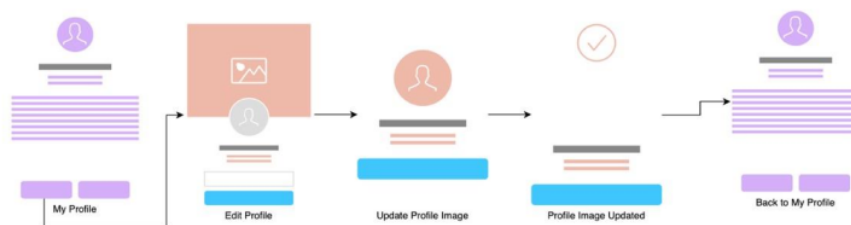


Fig. 4 The process of updating profile

In this online learning, there are two user e.g. registered user and general user. The general user only can show content and video that free access. The design will implementation on android and iphone platform. The result of this implementation can be seen in Fig. 5, Fig. 6, and Fig. 7.

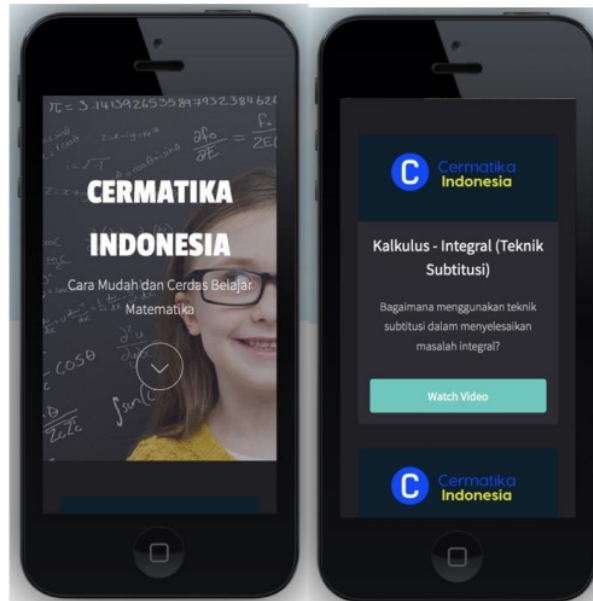


Fig. 5 The view of implementation on iphone platform.



Fig. 6 The view of implementation on iphone platform (playing video in landscape)

To see the results of the implementation, then the process of distributing questionnaires was carried out to find out the responses from users. The responses of the users can be shown in table 2.

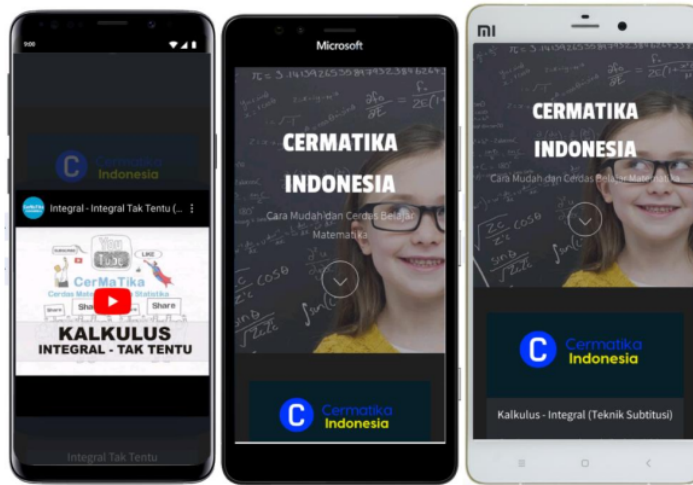


Fig. 7 The view of implementation on some android platform

Table 2 The responses of the user about the online learning platform

No.	Question	Strong Agree	Agree	Disagree	Strong Disagree
1.	Are you interested using this online learning?	4,9%	85,4%	9,8%	0%
2.	Can the use of online learning improve the effectiveness of your learning?	4,9%	70,7%	24,4%	0%
3.	Does online learning allow you to get feedback faster?	9,8%	75,6%	14,6%	0%
4.	Does online learning make it easier for your learning process?	14,6%	73,2%	12,2%	0%
5.	Can online learning save time and money?	14,6%	78,0%	7,3%	0%

Based on the table 2 shown that almost all of the user (>75%) agree the implementation of online learning can improve the learning process. This is in accordance with Jafar,et.al. [3] that online learning -Flipped Classroom Learning Model- is effectively used in mathematics learning and the opinion of Dhawan that e-learning can assist in providing inclusive education even in times of crisis and online teaching methods support and facilitate teaching and learning activities.

5. Conclusion

Based on the result and discussion, we can conclude that the design and development of online learning platform using heutagogy approach can improve the effectiveness of the learning process and the use of online learning will be a new method/approach of learning systems in the industrial revolution 4.0. Acceptance of online learning is also important because with this acceptance it can provide benefits for the development of education. This is supported by result of questionnaire which states that >75% of users are interested in using this system.

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