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The Integrated Academic Information System Support for **Education 3.0 in Higher Education Institution: Lecturer Perspective**

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Abstract. Education 3.0 has been implemented in many higher education institutions (HEIs). Education 3.0 has been directed the institution toward better educational experience. But on the other hands, the implementation of Education 3.0 also caused some problems. Previous research has found administrative problem experienced by the lecturer. This research explores deeper from the lecturer and suggested the solution from lecturer perspective, combined with information technology capabilities owned by the HEIs. The research used a case study as the method and conducted a qualitative research with a semi-structured interview. The interview analysis has found that the increase of the administrative processes is caused by online and offline administrative activities. The online activities are from e-learning and the offline activities are from traditional learning (face-to-face). The administrative processes also involved the academic information system (AIS). Simplified all of the administrative processes are more preferred. To overcome the problems, integrating the AIS and e-learning become necessary. This research suggests transforming the existing AIS into an integrated AIS and hopes the solution can simplify the administration process.

1. Introduction

The implementation of Education 3.0 has been directed the educational institutions toward better educational experience [1]. They can implement the characteristics of Education 3.0 one-by-one based on their needs. One of the characteristics is lecturing method. The lecturing characteristic in Education 3.0 more connected with technology. To provide and sharing the knowledge, e-learning often used as their technology. There are many e-learning technologies such as Moodle and Edmodo. Those applications are ready-to-use product. Many HEIs implemented e-learning with those applications [2]. Some of them developed their own e-learning application. The applications can support learning activity and administrative activity. In Table 1 below is a listed of whole characteristic of Education 3.0.

Table 1. The characteristics of Education 3.0 [3]

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	Education 3.0
Meaning is	Constructed in social community
Technology is	Everywhere, digital utilization
Lecturing is done	.Face-to-face and people-technology-people
Institutions are located	Anywhere in the "creative society"
Parents view education institutions as	Creating knowledge place for their children and provide support for parent involvement
Lecturers are	Everybody, wireless assisted, technology provide raw material for knowledge production
Hardware and software in schools	Available in affordable cost and maximized for the effectiveness of the learning activities
 Industry views graduate as	As entrepreneurs candidate and co-workers who can support the industrial involvement

Somehow, the implementation of Education 3.0, especially the lecturing characteristic caused some problems. Education 3.0 using dual lecturing method, the online method used e-learning and the offline/traditional method used conventional face-to-face learning. From [4] study, the increasing of administrative processes causes the lecturer often late to submit the final results. Their administrative activities are from e-learning, traditional learning and academic information system (AIS). A study by [5] also has found administrative problems when the e-learning and AIS are implemented in separated application. This research will explore deeper from the lecturer and the AIS capability. Finally, the aim is to find the solution from lecturer perspective, combined with information technology capabilities owned by the HEI.

2. Literature review

2.1. Academic information system

An information system (IS) often used in an educational institution is the academic information system (AIS). Many higher education institutions (HEIs) have been implemented the AIS [6]. Most of them implemented the AIS for helping the administrative processes in the academic affair [7]. They also used information from the AIS to make the decisions and policies [6]. With the current capabilities, the AIS can help the implementation of the Education 3.0.

According to [7], an academic information system (AIS) is application to support procedure the academic affair in an educational institution. Generally, AIS used to manage the student academic data, such as registration, courses selection, and provide the study results. Most of the AIS connected to the intranet for local used. The internet used when user need to access the AIS from outside the institution. The AIS described by [7] used only for the administrative purpose. The users are only the students and the administration staff.

From [6] study, AIS is a system used to manage and process the information resources in an HEI. The information output from this system will provide information to the decision makers or the executive leaders. AIS in [6] study used to help make a decision for institution development, instead for administration only. The AIS used by executive leader, lecturer, student, and administration staff.

The AIS has to accommodate to the needs of all users [8]. The [8] study compares the AIS in three different HEIs. The study found, the procedure and function of the AIS in the HEIs are similar. Therefore, the AIS must be flexible to development. The flexibility will help the system to stay up to date, and follow the needs of the users with better functionality over the latest technology.

From the facts above, most of AIS in the HEIs used for administrative process and support the decision maker. The current users also limited to executive leader, lecturer, student, and administration staff.

2.2. Education 3.0

Education world has a new paradigm called Education 3.0 [9]. The characteristics of Education 3.0 have extended the learning process. Education 3.0 also changed the academic stakeholder roles. Education 3.0 forced usage of advanced technology and extended the learner status [10]. The existing system must improve to support the characteristics.

Education has five (5) elements. There are learner, lecturer, context, subject, and evaluation. All the elements integrated to achieve the high level of meaningful learning. The achievement will emerge the empowerment in responsibility and commitment [11]. The collaboration among lecturer, student, parent, and administrator is a compulsory. The collaboration also need proffer technology to achieve the level.

According to [12], new ideas in lecturing and learning always had been awash the education concept. The administrator and lecturer got many reformation suggestions. They forced to use the new lecturing strategies and assessments in the new curricula. In the digital age, technology can support the all processes [13].

Education 3.0 characterized with multi-institutional and multi-cultural which the learners can be as knowledge creator and shared the knowledge into social community. The implementation of technology made distinction become blurred and no limitation for space and time [10]. The new approach offered by Education 3.0 mentioned by [11] and [13] where education enters the digital age and can emerging the empowerment. Those approach support by the integrated technology with wide access for learner and lecturer anytime and anywhere. With those, they can elaborate the knowledge in the system around the world [9].

In Education 3.0, students are not only consumed the knowledge but also empowered to produce it. [14]. As in Figure 1, Education 3.0 is made from Education 2.0 which is internet-enabled learning, and by centuries of experience with memorization in Education 1.0. Education 2.0 begins the transition to a new educational paradigm based on knowledge production and innovation production, the appropriate engines for viable 21st-century economies. Education 3.0 is qualitatively different incarnations that build upon Education 2.0 information sourcing capabilities and, to a lesser extent the memorization habits of Education 1.0 [3].

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3. Methodology

The case study method used in this qualitative research. Semi-structured interview conducted with lecturers who implemented Education 3.0 concept in their lecturing activities. They are also users of Sistem Informasi Akademik Universitas Langlangbuana (SIAk UNLA) in Bandung, Indonesia. Case study method suitable for investigating a contemporary phenomenon in depth when the boundaries between phenomenon and context are not clearly evident [15]. In this research, the Education 3.0 is a contemporary phenomenon and the AIS in the HEI is a context. This research starts the interviews with 10 (ten) lecturers. According to [16] and [17], the number of respondents in case study depends on the research itself. Their study suggests to do data analysis may follow or overlap with data collection. overlapping data collection and analysis has the advantage of adjusting the data collection process based on themes emerging from data analysis, or to further probe into these themes. The collecting data may stop if there is no longer anything new or already reach saturation level. After raw analysis, the data from respondents already saturated. The collected data will be analyzed and combined with AIS capability to provide the most suitable solution.

4. Analysis and Discussion

4.1. Analysis of interview data

From the interview with lecturers, they shared some problems when used e-learning and AIS in the separate application. They also used social media and instant messaging application to enrich their learning process. Because of those, they must spare more time to calculate the final results because they must combine and recap from electronic-based and paper-based marks. When all marks recapped, then they must key-in the results into the AIS. They also often late to submit the final results when handle more subjects or classes. The on time accomplishment of the final results is one of the performance indicators in higher education institution [18]. If many lecturers late to submit the final results, it will be affected to the institution's accreditation.

Besides the above problem, the interviews also discover the comforting usage from e-learning application with mobility support. They can access the e-learning from their mobile device anywhere and very enjoyed with the push notification function. But when they accessed the AIS with their mobile device, they felt the lack of function on it. They lost some information and function because the AIS did not support mobile platform yet. This also happens to the users that used their own institution's e-learning without mobile platform support. Furthermore, [19] found accessibility problems when the application did not support mobile platform. Besides that, the mobile platform provides an ideal avenue for the transfer of knowledge which will improve the learning capacity when collaboration is used in the learning process [20].

Based on the facts above, for the HEIs that have implemented Education 3.0 characteristics in their learning process are suggested to support those characteristics with their ICT capability. Application integration becomes necessary to simplified administration process and the application also must support mobile platform access.

4.2. Analysis of SIAk UNLA

As we know AIS is an information system for the academic purpose. The components are used in AIS will be same with IS components. The components of IS are hardware, software, database, procedures, people, and network. The hardware is a device such as a processor, monitor, keyboard, and printer. Together, these devices accept data and information, process them, and display them. The software is a program or collection of programs that enable the hardware to process data. A database is a collection of related files or tables containing data. A network is a connecting system (wire-line or wireless) that permits different computers to share resources. Procedures are the set of instructions about how to combine the above components in order to process information and generate the desired output. People are those individual who use the hardware and software, interface with it, or use its output [21, 22].

Based on the observation and documentation, the current state of SIAk UNLA from information system (IS) perspective can be shown below. The current state of SIAk UNLA based on IS components is given in Table 2.

IS Components	SIAk UNLA
Hardware	For both server-side and client-side already met the TIA-942 hardware standard
Software	Using open source OS and applications
Database	Using open source database (MySQL)
Procedures	AIS usage only for academic administration
People	Users are lecturer, students and administration staff
Network	Connected to the intranet and internet

Table 2. SIAk UNLA state base	ed on IS components
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The IS components can be used to relate the AIS and the Education 3.0. Research by [4] has found that all the characteristics of Education 3.0 can be supported by AIS. The characteristic of lecturing in Education 3.0 is lecturer to student, student to student, student to lecturer, people-technology-people (co-construction of knowledge). To support this characteristic, HEI must backup it with the code of conduct to avoid miscommunication and misunderstanding between lecturer and student. Code of conduct can clearly state the rights and obligations between lecturer and student [23]. From IS components overview, the support will come from procedures.

5. Conclusion

Based on analysis and discussion, this research has strengthened the problems faced by the lecturer when the HEI implement Education 3.0 in their learning process. Empowering ICT resources in the HEI can be a solution to solve the problems. AIS has capabilities to support the characteristics of Education 3.0 [4]. This research suggests AIS to transforms and enhancing by integrating with e-learning and becomes the integrated AIS with mobile platform supports. The integrated AIS hopes can decrease the administrative processes and makes lecturer more productive with less-administrative works.

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