The Integrated Academic Information System Support for Education 3.0 in Higher Education Institution: Industry's Perspective

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Abstract

The industry involvement in the higher education institutions (HEIs) has been existing for a long time ago. Somehow, the involvement was passive and mostly touched the strategic level such as curriculum development. After the industry suggested the curriculum development, they can't actively check the implementation of the curriculum. They only can check the curriculum result after the students graduated on a recruitment process. In the Education 3.0, industries are encouraged to involve more active in the learning processes. Therefore, this research explores deeper from the industry and suggested the solution from industry's perspective and combined with the information technology capabilities owned by the HEIs. The research used a case study method and conducted a qualitative research with a semi-structured interview. The interview analysis has found that the industry can't actively involve because they didn't have access to the learning processes. Therefore, this research suggests providing access for the industry in the integrated academic information system (AIS), since the integrated AIS has covered the e-learning and academic performance during the semester. With the access, the industry can actively involve and collaborate in the learning processes and also can choose the prospective candidates before they graduated.

Keywords
AIS, Education 3.0, HEI, industry

1. Introduction

Education 3.0 as a new paradigm in education has been directing educational institutions toward better educational experience (Lengel, 2013). They can implement the characteristics of Education 3.0 one-by-one based on their needs. One of the characteristics is industry involvement. In Table 1 below is a listed of whole characteristic of Education 3.0.

Table 1. The characteristics of Education 3.0 (Harkins, 2008)

Characteristic	Education 3.0
Meaning is …	Socially constructed and contextually reinvented knowledge
Technology is …	Everywhere (digital natives in a digital universe) for ubiquitous knowledge construction and transmission
Lecturing is done …	Lecturer to student, student to student, student to lecturer, people-technology-people (co-construction of knowledge)
Institutions are located …	Everywhere in the "creative society" (thoroughly infused into society: cafes, bowling alleys, bars)
Parents view education institutions as …	Places for students to create knowledge, and for which parents may provide domestic, volunteer, civic, and fiscal forms of support
Lecturers are …	Everybody, everywhere, backed up by wireless devices designed to provide information raw material for knowledge production
Hardware and software in schools …	Are available at low cost and are used purposively, for the selective production of knowledge
Industry views students as …	As knowledge-producing, co-workers and entrepreneurs who can support the development of focused knowledge constructionss

Mostly, industry and HEIs already collaborated in strategic levels such as research, knowledge transfers and curriculum development (Muscio, 2013). But at the operational level, such as recruitment, the collaboration happens after students graduated. The industry gets information about students' achievement after they graduated (Agrawal et al., 2016). Ideally, the industry also can involve in their learning process. Industry can access students' portfolio and achievement during the semester, or they can be reviewers in the related assignment. With those, the industry can select prospective candidates early before they graduated. But somehow, the industry also did not have access to do that.

The number of organizations with a dedicated campus recruitment strategy has increased by a whopping 25% since 2013. They choose it because of the cost effectiveness. With the evolution of human resource (HR) into a strategic partner in the growth and performance of an organization, the challenges faced by the HR workforce have also changed. Engaging and retaining top talent are one of the biggest challenges (Kaushik, 2016). No matter how fast people run, they can significantly improve the ability to cover long distances in relatively shorter time when they use a vehicle. The same goes for hiring. Technology can help to scale the efforts, make it significantly faster and eliminate human biases. The insight an experienced interviewer can bring to the table can become even more powerful with the right tools (Bhaduri, 2016). This research will explore deeper from the industry and the AIS capability. Finally, the aim is to find the solution from industry's perspective, combined with information technology capabilities owned by the HEI.

2. Literature Review

2.1 Academic Information System

As part of information system (IS), academic information system (AIS) was largely implemented in many higher education institutions (HEIs) (Indrayani, 2013). They used AIS to help them in manage academic affairs. Most of the HEIs only used AIS for administrative purposes (Utami & Raharjo, 2014). But on the other hand, the HEIs also used the AIS to support their decisions maker (Indrayani, 2013). With current technology, the AIS can be used to support another purpose such as Education 3.0.

Academic Information System (AIS) is software to help process the academic data of an educational institution. AIS in higher education institutions (HEIs) are generally used to handle the student academic data starting from registration, plan their study and to look at the study result. Most of the HEIs use web-based AIS connected to the intranet or the internet (Utami & Raharjo, 2014). The study mentioned the AIS only used for the administrative purpose. The users of AIS from this study only student and administration staff.

From Indrayani (2013) study, AIS refer to a set of systems and activities that are used to organize, to process, and to use information as a source within an HEI. The output of the information resulted from this system will deliver information to the leaders or the decision makers that can be categorized in different utilization and different purposes. AIS in this study not only used for the administrative purpose but also used by leaders of the institution to help them make a decision for institution development. The AIS used by students, lecturer, administration staff and executive.

An academic information system has to cater to the needs of students, faculty and administrative staff (Alyoubi & Arif, 2014). The study compares the AIS in three different HEIs. The study found that AIS mostly have same procedure and function. Hence, they also suggested AIS must be flexible to development. This helps the system to remain up to date and provides better functionality with changing technology and needs of the users.

From the facts above, current use of AIS in higher education institutions mostly for administrative process and support the decision maker. The current users also limited to lecturers, students, administration staff and executive leader.

2.2 Education 3.0

Education 3.0 is a new paradigm in education world (Stevenson et al., 2011). Its characteristics made learning process wider. The role of academic stakeholder has changed. Technology usage more advanced and the learner status also extended (Keats & Schmidt, 2007). The IS must be enhanced to support the characteristics.

Education is a complex process. In education, there are five elements: teacher, learner, subject matter, context, and evaluation. Those elements must be integrated constructively to effect high levels of meaningful learning. The meaningful learning will lead education to empowerment for commitment and responsibility (Novak, 2011). It demands the very best from parents, teachers, students, and administrators' collaboration and technology can help the collaboration. According to Wilson & Piterson (2006), education has always been awash with new ideas about learning and teaching. Teachers and administrators are regularly bombarded with suggestions for reform. They are asked to use new curricula, new teaching strategies, and new assessments. In the digital age, all those processes can be supported by technology (Jones, 2015).

To achieve collaboration in education, the use of technology becomes compulsory. When technology is implemented and integrated appropriately, they have an opportunity to learn about that technology by using it as a part of their learning. The education for empowerment by Novak (2011) and education in the digital age by Jones (2015) are played in a new approach to education. This new approach called Education 3.0. Education 3.0 means a rich, collaborative learning experience focused on authentic, project-based learning. Students and teachers should have access to materials, formative assessments and each other "anytime and anywhere," and be able to draw in experts from around their system or around the world at the touch of a button (Stevenson et al., 2011).

According to Keats & Schmidt (2007), Education 3.0 is characterized by rich, cross-institutional, cross-cultural educational opportunities within which the learners themselves play a key role as creators of knowledge artifacts that are shared, and where social networking and social benefits outside the immediate scope of activity play a strong role. The distinction between artifacts, people and process become blurred, as do distinctions of space and time.

In Education 3.0, students are empowered to produce, not only to consume the knowledge (Gerstein, 2014). As in Figure 1, Education 3.0 is made possible by 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 (Harkins, 2008).
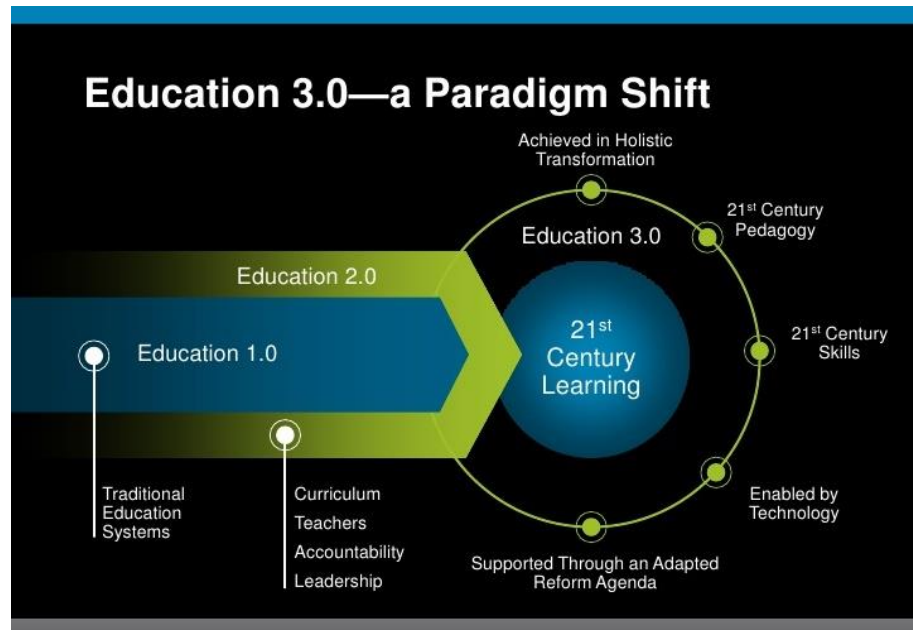
Figure 1. Education 3.0 paradigm (Stevenson et al., 2011)

3. Methodology

The research used a case study method and conducted a qualitative research with a semi-structured interview. University of Langlangbuana (UNLA), Bandung, Indonesia has been chosen as a case study. UNLA has been implementing the characteristics of Education 3.0. UNLA also has been cooperating with some industry/company.

This research took 5 (five) companies as respondents. According to Baker et al. (2012) and Marshall et al. (2013), 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 interview questions are:
- What is your opinion about industry involvement in education?
- How do your company involve to education?
- What kinds of involvement are more preferred by your company?
- What are the problems you experience when you involve and engage with the institution?
- What are your suggestions to the institution in facilitating industry involvement in students' education?

The analysis used thematic analysis based on the problems and industry's perspective. The analysis also included the current states of AIS at UNLA called Sistem Informasi Akademik (SIAk) UNLA. The analysis result will be combine and find what kind of support from SIAk UNLA to support the characteristics of Education 3.0, especially for industry involvement.

4. Result and Discussion

4.1 Industry's Perspective

After all the interview data transcribed, a thematic analysis (TA) has been prepared for analyzing the data. TA is a method for identifying and analyzing patterns of meaning in a dataset (Braun & Clarke, 2006). Since a TA refers to themes, a theme refers to a specific pattern of meaning found in the data. The themes for this research are current involvement, current problem, and future involvement. Each theme applied to the transcribed data and analyzed by a

tool called NVivo. NVivo is a software for analyzing unstructured or semi-structured data like interviews, surveys, field notes, web pages and journal articles. The analysis result summarized in Table 2.

Table 2. Summary of the analysis result

Themes	Common Issues
Current involvements	Employee recruitment at university job fair; curriculum suggestions; internship
Current problems	Hard to find qualified candidates; cannot follow-up the curriculum suggestions; lack of data on students' achievement and portfolio
Future involvements	Access on students' achievement and portfolio; active collaboration on curriculum development

The result above has strengthened the problems mentioned by previous research. The industries only can get students' information after they graduated. They also cannot monitor the current curriculum because they did not have the access. The industries want to collaborate actively and have access to the data of students' achievement. The opportunity of the future involvements will be clear after getting the result from the analysis of information system capabilities owned by the institution.

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 individuals who use the hardware and software, interface with it, or use its output (Laudon & Laudon, 2016 and Turban et al., 2013).

Based on the observation and documentation, the current state of SIAk UNLA from the information system (IS) components and the characteristics of Education 3.0 can be shown in Table 3 below.

Table 3. The current state of SIAk UNLA

IS Components	The characteristics of Education 3.0	SIAk UNLA
Hardware	Affordable cost and met the international standard	For both server-side and client-side already met the TIA-942 hardware standard
Software	Low cost and/or open source	Using open source OS and applications
Database	Low cost and/or open source	Using open source database
Procedures	Both learning and administration processes	AIS usage only for academic administration
People	Involve student, lecturer, parent, and industry	Users are lecturer, students and administration staff
Network	Internet activities and mobile	Connected to the intranet and internet

Based on the facts above, the AIS owned by UNLA nearly matched with the characteristics of Education 3.0. The supporting opportunity of future involvements from industry's perspective can be proposed smoothly to the educational institution.

5. Conclusion

The analysis of the interview data has been revealed some interesting facts. The industry has the same point of view and nearly matched with the concept of Education 3.0, even the industry did not aware that the concept of Education 3.0 is existing. The facts proved the concept of Education 3.0 very suitable for 21st-century education from the industry's perspective. Furthermore, the suggestions from industry were aligned with the characteristics of Education 3.0, especially the industry involvement characteristic.

The analysis result of SIAk UNLA can be used as a guide for the AIS to support the implementation of Education 3.0. The future involvements suggested by the industry can be supported by the AIS. The AIS can provide the access to the student's achievement and portfolio. With the access, industry can more active to collaborate with the HEI. Moreover, since e-learning was actively used in Education 3.0 concept and some of the student's achievement and portfolio were stored in the e-learning, this research suggests to integrating the AIS and e-learning system. The integration will be useful to provide more comprehensive data.

Finally, the research suggests to the HEI for preparing the tidy procedures before providing the access to the industry. The HEI must be aware of confidentiality and reliability. The tidy procedures can guide us to identify what kind of data can be shared or not shared. Furthermore, since the users of the AIS will increase time-by-time, therefore the improvement of hardware capability and internet bandwidth capacity must be considered wisely.

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