Digital-Based Service In Higher Education: A Systematic Literatur Review

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ABSTRACT

The industrial revolution 4.0 has required higher education institutions to follow changes by changing education services to digital-based ones. The aim of this article is to identify and summarize the various types of digital-based services that are taking place in higher education institutions. To answer the research questions, the research method used is a systematic literature review by selecting and reviewing of literature that meet the requirements and are relevant as literature sources for analyzing the types of digital-based services that exist in higher education institutions. Digital-based services can be defined as a service that is carried out using a full technical system, where users call on digital information, computing, communication and automation (ICCAT) technology systems which together can create the desired results. The research findings provide a comprehensive understanding and valuable information for stakeholders regarding the digital-based services that need to be available in a higher education institution.

Keywords: digital-based service, higher education, systematic literatur review

1. Introduction

Long before the COVID-19 pandemic, several universities in Indonesia had implemented online learning or blended learning (mixed online and offline learning). However, with the COVID-19 pandemic there has been a change in the learning system in higher education in Indonesia, where 4,000 higher education institutions in Indonesia, 7 million students and 300,000 lecturers have moved from offline learning methods to online learning methods (Rustandi, 2020). World education leaders are trying hard to improve services and the efficiency of education delivery because government policies have paused (Becker et al., 2017; Manullang et al., 2021).

The COVID-19 pandemic has made universities experience difficulties in the learning process and even academic services in general. Lecturers, academic service employees and students must make new adaptations in carrying out the learning process and academic services to new conditions. New problems such as changes in learning schedules, low attendance, dissatisfaction with academic results, difficulties using technology, students withdrawing from student status, are new challenges that must be provided with solutions. Digital technology is an important and inseparable part of the current training process (Ardiansyah, 2022).

Since the presence of digital technology in higher education institutions, many changes have occurred in academic services through administrative systems that have been integrated with technology (Putra et al., 2020). This has an impact on academic services which previously only relied on work with paper and simple machines, finally transitioning to a fast and instant computing environment (Picciano, 2012). Apart from that, the presence of social media is a reality in higher education institutions where information is instant, as a form of technology that has innovated and changed the way students learn and view education which was initially traditional and has moved into a new era of educational transformation (Fauzi et al., 2018). Ideas and thoughts related to the development of virtual administrative service systems have become a new trend and created a new paradigm in the world of education and other academic services (Pakhomova et al., 2021).

This article provides an overview and summarizes the research results reported through a

systematic literature review of digital-based services that have taken place in higher education. To ascertain whether there has been previous research on digital-based services, higher education or colleges or universities, and a systematic literature review. Based on the search results, no systematic literature review was found regarding digital-based services in higher education. Therefore, it is important to obtain the latest picture of digital-based services in higher education and determine the dimensions or aspects of digital-based services in higher education, so that the author considers it appropriate to conduct a systematic literature review on digital-based services in higher education.

2. Methods

This research uses a systematic literature review method which consists of six main steps, namely: determining data sources, search strategy, study selection, study quality assessment, data extraction, and data synthesis (Benavides, 2020). The explanation of these six steps is as follows:

a. Data Source

The data source in searching for data related to digital-based services in higher education is based on the scientific literature data base on Googe Scholar, with publications from various very significant fields of science (Benavides, 2020), especially related to issues of digital-based services in higher education.

b. Search Strategy

The search strategy allows filtering the information available in the data base, so that the selected articles can answer the questions asked in the research, as presented in Table 1.

Table 1. Inclusion and Exclusion Criteria for the Selection of Resources of Digital-Based Service

Inclusion Criteria	Exclusion Criteria
1) Published in 2013 or later	1) Dissertations and theses
2) Review and meta-analysis studies	2) Conference papers without proceedings
3) Peer-reviewed articles	3) Coference poster papers
4) Articles in English	4) Resources on pre-school education
5) Book Chapter	
6) Governmental reports	
7) Resources on higher education	

c. Study Selection

The study selection process is based on the following criteria: 1) Study Design, which includes studies that identify the service dimensions of digital-based higher education institutions; 2) College population; 3) Intervention, digital transformation-based service quality in higher education; 4) Comparison, where no comparison is projected; 5) Results, dimensions of digital transformation-based services in higher education; and 6) Time (2012 to 2023), because it is considered that the literature must be the latest.

d. Study Quality Assesment

Assessment of the quality of studies is carried out by verification by reviewers with the following conditions: the eligibility criteria for the articles being reviewed are articles that include the words "digital-based services" and "higher education" in the title and/or abstract. In cases where the title and abstract are not enough to decide, the author will read the entire contents of the article to decide whether the article meets the criteria or not.

e. Data Extraction

The software used in the data extraction process is Microsoft Excel and Mendeley reference manager. Next, the data collection process goes through three stages: 1) Information Analysis, by highlighting the answers to research questions with different colors using Mendeley; 2) Information Classification, by assigning a code label in the form of an acronym to the information to be classified; and 3) Information Extraction, as can be illustrated in Table 2.

Table 2. Acronims to Clasiffy Information

Sources	Acronyms
Definition of digital-based services	Technological (TC)
Digital-based service dimension and characteristics	Sosial (S), Organization (O), Technology (Tech)
Stakeholders involved ini digital-based service in Higher Education Institusion	Students (S), Teachers (T), Alumni (A), University Managers (M), Faculty (F), Departments (D), Parents (P), Digital Platform (DF), Management Information Systems (SIM), Higher Education Institusion (HEIs), Library (L).
Technologies used	Learning Management Systems (LMS), Information Communication Technology (ICT), Software (SW), Flipped Learning (FL), Digital Technology (DT), Blended Learning (BL), Modular Object-Oriented Dynamic Learning Environment (MOODLE), Virtual Reality (VR).

f. Data Syntesis

Data is tabulated and displayed regarding the definition of digital-based services; dimensions and characteristics of digital-based services; stakeholders involved in digital-based services in higher education institutions; and technology used in digital based-service.

3. Result and Discussion

a. Definition of Digital-Based Service that Are Stated in the Literature and Are Applied to HEIs

The exixtence of technology is an innovation and an effort to accelerate the achievement of academic service goals (Dacholfany et al., 2021). Digital learning is the integration of digital technology in learning services, where digital tools can influence learning services. For example, through 'eService-Learning', creating a learning experience through online and hybrid learning. Digital learning services explore how digital technology used in learning services impacts the experiences and outcomes felt by students (Eaton & Leek, 2021).

Service can be interpreted in three ways. First, service is a benefit or assistance provided to other people, where in this case two roles can be identified, namely service provider and service recipient (customer). Second, service is a product or result of work that is useful and is not a tangible merchandise or it can be interpreted as service is something that is intangible and is a result or product that provides benefits from the service provider to the service user. Third, service is a system of labor and material assistance that can be used to complete several routine jobs (Smith dalam Pakkala & Spohrer, 2019).

Digital-based services can be defined as a service that is carried out using a full technical system, where users call on digital information, computing, communication and automation (ICCAT) technology systems which together can create the desired results. Providing digital services is a process that needs to be carried out by digital service providers so that existing digital services provide benefits and results for service users by meeting the value proposition and expectations of service users (Pakkala & Spohrer, 2019).

b. Dimensions and characteristics of Digital-Based Services

Digital transformation has been studied in social, organizational and technological aspects. In these three contexts, the dimensions of higher education institutions that are absorbed in the digital transformation process found from various literature include: teaching, curriculum, infrastructure, administration, research, business processes, counseling, human resources, digital-based service governance, information and marketing.

According to Salminen (2014), digital-based services are offers that combine several characteristics related to the services provided. The foundation of the digital service concept consists of four characteristics of digital services, namely: intangibility, invariance, high tech,

and scalability or better known as the IHIS model.

1) Intangibility. Digital services do not involve physical evidence (real evidence). This can be called a real form of digital which helps customers in formulating initial perceptions, attitudes and intentions towards digital services.

2) Invariance. Services can be standardized both in terms of fees and quality. Some digital services are provided as standardized offerings with high levels of satisfaction and do not change.

3) High Tech. The focus of marketing this service is on services provided through an application interface, where human distance is not an obstacle, such as implementing a live chat component. The desired results are better service, a high level of trust, and the provision of information on questions asked by customers, in this case students.

4) Scalability. Digital services are characterized by unlimited seats meaning that services can be tailored to demand. For example, when 10 customers use a product today and 100 customers tomorrow, this increase does not require additional action from the service provider because the service system is scalable.

c. Stakeholders Involved in Digital-Based Services in Higher Education Institutions

The stakeholders involved in digital-based services are digital service providers and digital service recipients. Students, lecturers, higher education management staff, alumni, scholars, IT company leaders, digital services, family members, content producers, information systems, are some of the stakeholders who have been identified as having participated in digital processes in higher education institutions, both as beneficiaries or as a leader (Alenezi, 2023).

d. Technology Used in Digital-Based Services

The existence of information and communication technology in higher education institutions has brought reforms in higher education to complete activities and processes to improve teaching, administration and service quality (Pessôa & Trabasso, 2017). Since the emergence of technology, virtual software for higher education administration services is a tool that can reach all existing networks, starting from the student registration process to assessment and evaluation (Ghavifekr et al. 2013). The implementation of student exams used to be carried out using a complex mechanism, now through online exams, implementation has become easier (Elmoselhy, 2013). Technology offers a fast, accurate, flexible service which is the dream of all students because systems and services are getting better, apart from that the management of student data in faculties and student attendance is carried out electronically (Huang & Lin, 2017).

Digital learning design can partially or fully integrate digital learning resources and tools such as video tutorials, and has the potential to change traditional teaching into active learning in the classroom (Prince in Ødegaard et al., 2021). Digital learning design includes various technologies such as applications, virtual reality, podcasts, educational games, videos and animation. Digital learning design can be divided into two, namely: mixed learning and distance learning. Blended learning combines face-to-face learning with online learning or often combines asynchronous learning (online, flexible time) with synchronous learning (online, face-to-face, real time), while distance learning is a term for learning that is completely online and the teaching and learning process is facilitated by a web-based system that can connect students with lecturers, and can also be completely asynchronous (Simonson dalam Ødegaard et al., 2021).

According to Jaakkola et al. (2016), digitalization of the learning process can be done with various alternatives, including: 1). Blended learning: learning with mixed methods and media – includes several elements such as classroom studies, archived video lectures, shortened video-based lecture materials, combining Massively Open Online Courses (MOOC) materials into studies, broadcasting online video lectures, etc. . 2). Flipped learning: supports students' independent learning with a variety of materials (see item above) and focuses on face-to-face

learning resources for collaborative problem solving; 3). Use of MOOCs (which are available globally) as substitute or supporting materials for local course delivery; 4). Use of groupware facilities - chat, online group sessions, network-supported collaborative problem solving, various tools for distributed development, and some additional methods (2016). The blended learning design that utilizes flipped classes is expected to allow students to complete pre-class activities (asynchronous online learning) before the teaching and learning process in class (Coviil & Cook, 2019; Day, 2018; Deprey, 2018; Murray, 2014).

The digital learning process is carried out with visualization and interaction between lecturers and students. The concept of visualization and interaction can be done with certain applications such as Modular Object-Oriented Dynamic Learning Environment (MOODLE). The interaction aspect is supported by knowledge testing features (assignment, lesson, survey, quiz) and communicating among students (forum, glossary, webinar, chat, workshop). Meanwhile, the visualization aspect is supported by external applications such as biteable.com, canva.com, mindomo.com and wordArd.com (Ardiansyah, 2022). Some digital teaching and learning technologies that are often used in higher education institutions include: Learning Management Systems (LMS), synchronous technology, multimedia applications, collaborative applications, cloud-based technology, and emerging technologies (Alenezi, 2023).

4. Conclusions, Limitations, and Implications

In the conclusion section at the end of this article the author will convey several points based on the results of the systematic literature review that has been carried out. Digital-based services can be defined as a service that is carried out using a full technical system, where users call on digital information, computing, communication and automation (ICCAT) technology systems which together can create the desired results. There are four characteristics of digital services, namely: intangibility, invariance, high tech, and scalability. Students, lecturers, higher education management staff, alumni, scholars, IT company leaders, digital services, family members, content producers, information systems, are some of the stakeholders who have been identified as having participated in digital processes in higher education institutions. Some digital teaching and learning technologies that are often used in higher education institutions include: Learning Management Systems (LMS), synchronous technology, multimedia applications, collaborative applications, cloud-based technology, and emerging technologies. The author believes that the presentation of data related to digital-based services in higher education institutions will provide enlightenment for readers. The author also believes that these secondary data findings also have limitations and weaknesses. Therefore, the author hopes for constructive criticism and suggestions so that further research will receive meaningful input.

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