Development of Smart Digital

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Development of smart digital interactive service as a strategy for guidance and counseling services in higher education

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Abstract:

The digitalization of guidance and counseling services are easy to access and effective in higher education. This study aims to develop Smart Digital Interactive Service as a strategy for guidance and counseling services in higher education. This study is a form of Research and Development (R&D) research that employs the waterfall approach model, which consists of four primary phases: Planning, analysis, design, and implementation. Research subjects were selected by purposive sampling, where subjects were selected based on specific objectives. Smart Digital Interactive Service products are assessed by four phases: information technology experts and guidance and counseling experts and content expers. The effectiveness of the product was evaluated by 15 students on a limited scale, and then by 30 students on a larger scale. Using questionnaires, researchers gathered information on the effectiveness of Smart Digital Interactive Service products as guidance and counseling service strategies in universities. The scores were assessed in percentages and grouped based on the "eligible" category. The outcomes demonstrated that Smart Digital Interactive Service development is "highly practicable." The evaluation is based on the advantages, functions, communication, material content, language, and communication. This study demonstrates that Smart Digital Interactive Service is "feasible" for use in higher education as a strategy for guidance and counseling service delivery.

Keywords:

Guidance and counseling, higher education, smart digital interactive service

Introduction

The global Coronavirus disease 2019 (COVID-19) pandemic has accelerated digital transformation significantly.[1-3] Almost all human activities utilize digital technology, notably communication, due to social restrictions to maintain health protocols.[4-6] In education, the percentage of digital technology used by the population aged 5–24 years for communicating is increasing.[7] This digital use is consistent with the concept of the Industrial Revolution 4.0, in which digitalization is linked to the internet.[8] This digital transformation requires universities to accelerate the transformation of the education system towards digitalization[2,9] Today's rapidly growing digital transformation requires universities to innovate to survive and compete consistently.[10,11] Higher education institutions must integrate all learning services and activities using digital technology.[5,12,13]

Guidance and counseling services, as an essential part of a university, are required to continue to innovate in providing services to students.[14-16] Cyber counseling[17-21] or internet counseling[22,23] or online counseling[24,25] are already prevalent in

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guidance and counseling services. The purpose of digitizing counseling services is to make them more accessible or practicable due to the fact that they are independent of location and time.[26] The digitization of counseling services is one solution for counseling services that are limited by the lack of counseling opportunities (clients) to visit counselors due to the distance and relatively excellent location of counselors[23,27] They are a solution due to clients' anxiety when meeting directly with counselors, a solution for counselors who do not have the opportunity to meet directly with clients, and a solution due to the pandemic's limitations.[28-30]

One of the studies conducted by M. G. Shahamabadi, *et al*.[31] during the COVID-19 pandemic at Imam Jafar Sadegh Hospital in Meybod, Iran, where a study was conducted on 80 women with a history of miscarriage by providing online counseling to them. The results of the study showed that online counseling was effective in reducing the level of anxiety felt by women after miscarriage. In addition, the research conducted by Amini N *et al.l.* xamined 184 health workers and 184 clients at the Health Center at TUMS (Tahenran University of Medical Sciences) from January 20 to May 21, 2021 by providing online training and counseling to them. The results of the study show that online counseling on a healthy lifestyle in primary health services can control the risk factors of non-communicable diseases for clients and improve online counseling skills for health workers.[32] One form of digitizing services for students in higher education is the use of online-based Acceptance and Commitment Therapy (e-ACT) in Malayisa. The study examined the effectiveness of e-ACT on psychological flexibility and mental well-being assessed among 52 Malaysian undergraduate students aged between 18 and 23 years during the pandemic. Participants received two online e-ACT sessions (a total of 5 hours). The results showed that there was a significant increase in mindfulness, psychological flexibility, and well-being among students.[33]

The digitalization of guidance and counseling services in higher education is an effective and efficient means of establishing communication between counselors and service subjects (clients), where counseling or services are typically only provided in the form of relationships within a face-to-face digital academic framework.[13,34-37] However, communication relationships that are framed academically and guidance and counseling service are usually done through social media, Facebook, Instant Messenger (IM), or email.[26] This is unfortunate because online counseling is not made programmatically or deliberately, so the activities of guidance and counseling services are limited to ordinary "online vents" without being framed by the professional ethics of guidance and counseling.

The guidance and counseling service program component of higher education includes essential services, responsive services, individualized planning, and system support.[38,39] Essential services can be done through classical and group strategies by providing orientation and information services programmatically. Responsive services are conducted through individual and group counseling strategies, consultation, handover, and peer guidance. Personal planning services are carried out through individual and group assessment strategies, advisory, placement, and distribution. System support is done through professional development strategies and collaboration. The many types of digitally integrated guidance and counseling service development have not met all components of universities' guidance and counseling service programs and guidance and counseling service strategy. The digitally integrated guidance and counseling service is only limited to individual counseling services that respond to students' needs to escape their problems.

The readiness of guidance and counseling services to take advantage of purposefully created or programmed digital technology is required so that students from generations who are very familiar with digitalization[40,41] can make the most of guidance and counseling services.[42] Digitalized guidance and counseling services are a medium specifically designed to meet the needs of psychological consultation services for students in higher education, provide convenience for students to access services while remaining framed in the professional ethics of guidance and counseling, and offer counselors comfort in archiving data and storing all service records.[26] Digital guidance and counseling services allow students and counselors to communicate asynchronously via chat or email. At any time, students want to ask questions or share their concerns, and counselors can respond. This increases communication flexibility and allows for more frequent interactions.[43]

The process of accrediting higher education institutions includes counseling services. Criterion 3 of the Student Policy[44] addresses counseling services. IAIN Curup, one of the institutions in Bengkulu province, has a guidance and counseling service unit that offers counseling, academic, and development services. This counseling service still employs a conventional system or requires direct meetings with a counselor, resulting in numerous obstacles and challenges.

In conventional counseling services, numerous obstacles exist. There are currently no optimally digitally integrated counseling and guidance services. It is necessary to develop guidance and counseling services that students of the millennial generation can readily access and that meet all components of university guidance and counseling

programs and service strategies. In this study, a digitally integrated guidance and counseling service strategy will be developed with the title "Smart Digital Interactive Service as a Guidance and Counseling Service Strategy for the Millennial Generation in Higher Education." This study is expected to produce a significant finding that can be implemented as a counseling and guidance service strategy in universities today.

Material and Methods

Study design and setting

This research develops Smart Digital Interactive Service with the Hannafin and Pack approach model which consists of four phases, namely the needs assessment phase, the design phase, and the development and implementation phase. In the first phase, the researcher identified the needs of students for digital-based counseling services so that the development of Smart Digital Interactive Service is needed. In the second phase, the researcher prepares a flowchart of program stages and media content in Smart Digital Interactive Service. The third stage of the development of Smart Digital Interactive was tested on experts and then tested on small groups and large groups of student respondents at the State Islamic Institute (IAIN) Curup, Bengkulu Province, which started from July 8, 2022, to October 28, 2022.

Study participants and sampling

The first phase is the phase of identifying student needs for guidance and counseling services in Higher Education. IAIN Curup has 24 study programs consisting of S1, S2, and S3, and the number of active students for the odd semester period of 2022/2023 is 4674 people. For the large number of students, of course, the conventional offline services at the Guidance and Counseling Service Laboratory are not effective where the available counselors are only six people. Therefore, it is important to have digital-based guidance and counseling services that can be accessed online so that guidance and counseling services in higher education can be provided equally to all students. The design phase is based on an analysis of the needs of guidance and counseling services in universities. The system description is designed using process modeling, which functions to determine the user, system input, process, and output generated by the system so that the designed system can run according to the direction and flow of the system using a context diagram. After the development of the menu bar on the Smart Digital Interactive Service product, the Smart Digital Interactive Service product was tested or validated twice by information technology experts and two guidance and counseling experts.

In the second phase, the researcher prepares a flowchart of program stages and media content for the Smart Digital Interactive Service. The third stage of Smart Digital Interactive development, which is tested on experts (expert judgment) is then tested on small and large groups of student respondents to assess the use of Smart Digital Interactive Service.

The next step to see the extent to which the Smart Digital Interactive Service product can be used by students is to be assessed by students as respondents. The assessment by the respondents was carried out in two stages, the first was a small group of 10 students and a large group of 30 students.

Intervention

To assess the use of IAIN Curup's Smart Digital Interactive Service product, the researcher gave respondents an explanation of how to access IAIN Curup's SmartCounseling account. After that, students register to get a username and password so that students can log in to the Smart Digital Interactive Service IAIN Curup account. Each student has access to online counseling sessions that are arranged periodically for eight weeks via video call or chat with a counselor. They also have access to online discussion forums, where they can interact with their peers and counselors to get social support and share experiences.

Data collection tools and techniques

In this study, a checklist questionnaire with a Likert scale of 28 items was used.

Each questionnaire has three parts: service process, service content, and service communication. In this study, the questionnaire was assessed by two programmers and three guidance and counseling experts. The questionnaire trial was given to 30 students.

Analysis

Data analysis with Chi-square test, one-way, and independent t-variance analysis using SPSS software version 16. Cronbach's alpha calculation yielded a value of 0.82, which indicates that the questionnaire has good internal consistency.

Results

(1) Needs Assessment Phase

The first phase identifies the guidance and counseling requirements of higher education students. IAIN Curup offers 24 degree programs consisting of S1, S2, and S3; the number of active students for the odd semester of 2022/2023 is 4,674 individuals. With only six counselors available, the Guidance and Counseling Service Laboratory's conventional offline services are ineffective for many students. Therefore, the significance of digital guidance and counseling

services that can be accessed online, so that guidance and counseling services can be provided uniformly to all university students, is highlighted.

(2) Design Phase

The design phase is based on analyzing the need for guidance and counseling services in higher education. System depiction is designed using process modeling, which determines users, system inputs, processes, and outputs produced by the system so that the system can run according to the direction and flow of the system using context diagrams. The following describes the context diagram of the *smart digital interactive service* system. The design results are shown in Figure 1 below:

In the system process modeling above, depicted in the form of a system context diagram, it is known that there is an incoming data flow to be processed by the system, and the system provides output to each entity. The Smart Digital Interactive Service Application System consists of the Smart Digital Interactive Service System Process and several entities, including administrator entities, teaching entities, student entities, general entities, and public entities, where all entities are involved in inputting into the Smart Digital Interactive Service system processes. Consequently, each entity will receive the results of The Interactive Service's processing by the Smart Digital system.

The description of the flow of all entities ranging from administrator entities, teaching entities, student entities, general entities, and public entities can be described as follows: a) The Smart Digital Interactive Service system process includes a component that functions as a data processor for requests from entities so that the system process can deliver the intended outputs and regulations for each entity; b) The administrator entity is an entity with full control over the system, including the ability to submit news, categories, announcements, YouTube video lists, counselor lists, and counselor schedules. This administrator is also responsible for adding user accounts for instructors, general users, and students. Users and passwords are generated by the administrator so that the system can process the user and password sent to the user's email. The administrator helps create basic service categories and responsive services consisting of classical, group, and individual use. This administrator also divides the service section into academic learning services, study skills services, or learning training and career development services. The administrator also functions as a control for grouping participant data that will be included in services that have been planned according to the request of counselors; c) Teaching entities are entities that can upload content in the form of pdfs and YouTube videos, create discussion chats, schedule zoom meetings, and upload materials for classics, groups and counseling for learning services, learning training, and career development; d) Student entity is an entity that can receive services that can be accessed according to the intended service designation, such as learning services, learning training services, and career development services for classical, group, and counseling categories, in addition to more interactive responsive services through zoom meetings; e) The general entity is identical to the student entity in that

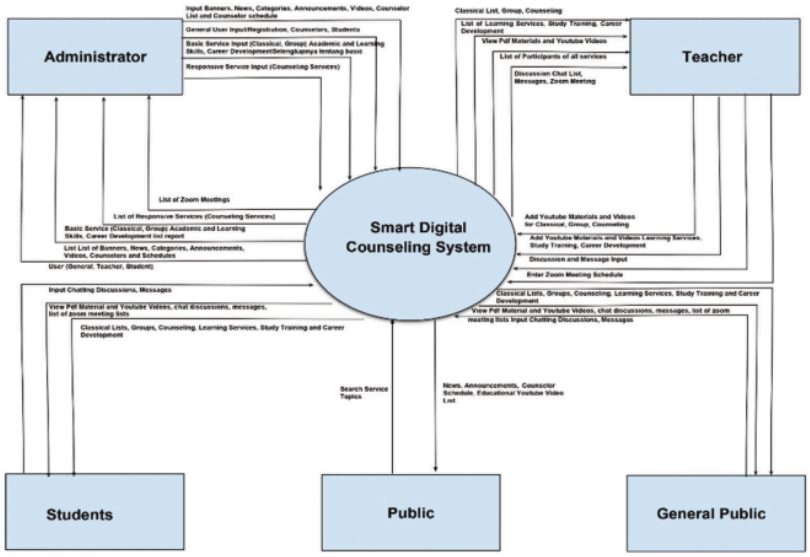

Figure 1: System context diagram

it is an entity that can receive services according to the desired service designation, such as learning services, learning training services, and career development services for classical, group, and counseling categories, as well as more interactive responsive services through Zoom meetings; and f) Public entities are entities that have access to news, announcements, counselor schedules, educational YouTube videos, and can search for counseling-related topics via the Smart Digital Interactive Service website.

(3) Design and Implementation Phase

Researchers consulted expert developers to set the menu bar on the virtual display. The time it takes is quite long. Errors in programming languages, Html, and coding lead to errors in giving commands. In addition, it is necessary to evaluate several parties to collect input in the form of menu bar work functions, colors, design, content, discussion, and communication before validating based on instruments. The results of development are shown in the following design, Figure 2.

Administrators, teachers, students, and general and general users can log in using the username and password the admin sent in their email. The login menu can be seen in Figure 3 below.

Smart Digital Interactive Service products feature a menu bar that includes banners, news, categories, announcements, videos, counselors, messages, and users, as well as an application menu bar that includes basic services, responsive services, and Zoom. The menu bar for the Smart Digital Interactive Service product is shown in Figure 4.

After developing a menu bar for the Smart Digital Interactive Service product, experts in information technology and guidance and counseling conducted two tests or validations of the Smart Digital Interactive Service product. The assessment of information technology experts is based on three domains: the use side, the display side, and the function side. Expert assessment of guidance and counseling encompasses three domains: the design aspect, the content aspect, and the communication process aspect. The results of *Smart Digital Interactive Service* product validation can be seen in the following Table 1.

The results of expert validation revealed that the average score attained by information technology experts was 84.4% and that of guidance and counseling experts was 81.1%. The score falls within the acceptable range. Domain utilization validation by an information technology expert received a score of 82%, the Display domain received a score of 67%, and the Function domain received a score of 70%. The Design domain received a validation score of 82% from guidance and counseling experts, while the Content domain received a validation score of 67% and the Communication domain received a validation score of 79%. From expert validation scores on Smart Digital Interactive Service products, it is possible to conclude that Smart Digital Interactive Service products are "feasible" for use in universities as guidance and counseling services for millennials. The next step will be to determine how well students can use Smart Digital Interactive Service items. Students serve as respondents in an assessment. There were two stages used to assess the respondents. The first consisted of a small group of ten people and a large group of thirty people. The results of the respondents' assessments are shown in Table 2.

Based on the assessment results of a small group of student respondents (10 persons), the average score received by Smart Digital Interactive Service items is 91.35%, which places them in the very good category. Similarly, the results of the big group evaluation (30 persons) yielded an average score of 89.01%, which falls into the category of very good. Based on the assessment of student responses, it is possible to conclude that the Smart Digital Interactive Service product can be used as a method for delivering guidance and counseling services to the millennial generation in higher education.

Figure 2: Smart digital interactive service initial display

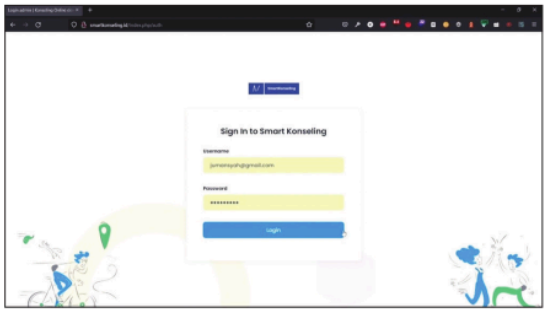

Figure 3: Login menu on smart digital interactive service

Table 1: Validation of information technology experts and guidance and counseling experts

Members	Variable	Total	ST	S	TK	TS	STS	Total	Average	Category
Information Technology Expert (2)	Use	100 (10)	10	63	3	0	0	82%	84.4%	Proper
	Display	80 (8)	15	52	0	0	0	67%		
	Function	80 (8)	30	40	0	0	0	70%		
Guidance and Counseling Expert (2)	Design	100 (10)	5	76	7	0	0	82%	81.5%	Proper
	Accounts	80 (8)	15	52	4	0	0	67%		
	Communication	100 (10)	0	76	3	0	0	79%		

ST=strongly agree, S=agree, TK=no decision, TS=disagree, STS=strongly disagree. Source: Prepared by the author, (2023)

Table 2: Student response to smart digital interactive service products

Respondent variables	Number of items	Score	%	Average	Category
10 Student Respondents					
Service Process (10)	100	435	88.4%	91.35%	Very Worth It
Content of Services (8)	80	373	93.2%		
Service Communication (10)	100	462	92.4%		
30 Student Respondents					
Service Process (10)	300	1305	87%	89.01%	Very Worth It
Content of Services (8)	240	1119	93.25%		
Service Communication (10)	300	1302	86.8%		

Source: Prepared by the author (2023)

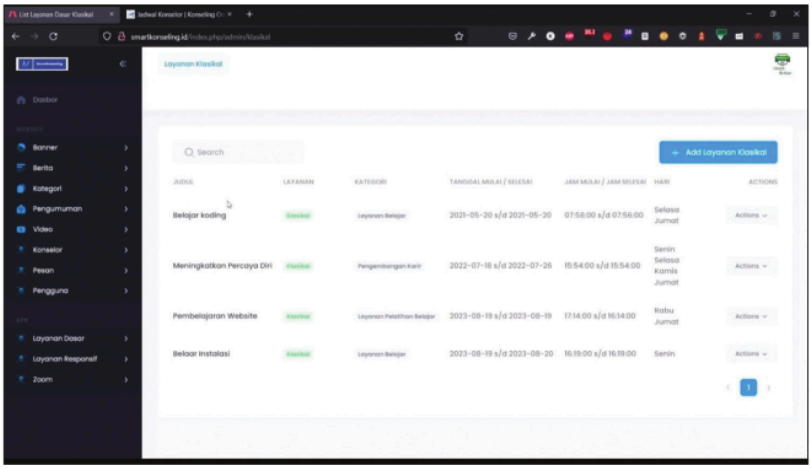

Figure 4: Smart digital interactive service product menu bar

Discussion

Based on the research results of Smart Digital Interactive Service product development, it is strongly advised to adopt Smart Digital Interactive Service products at universities. Students require supervision and direction to conduct daily activities well and effectively in order to develop optimally and prevent academic problems.[39,45] They can gain guidance and direction without having to meet with a counselor or enroll in a specific class. This makes it very easy for people to gain access to services that are available instantaneously through digital media.[1,12,46-49] However, smart digital interactive service is still only a complement to university guidance and counseling activities. Face-to-face service activities must still be carried out.[50]

Smart digital interactive service products have the following advantages: 1) Save time and money by avoiding requiring students to devote additional time to accessing or receiving guidance and counseling services[51]; 2) Students have the ability to contact guidance and counseling services at any time and from any location as long as they have an internet connection,[52] and they can decide when it is suitable to do so; 3) The standardization of services obtained by students is not much different from the standard of services carried out face-to-face.[47,53] Through this intelligent digital interactive service site, students get

the same counseling services as face-to-face counseling services. Students' academic abilities can be improved through services on smart digital interactive service sites, and student problems can also be addressed through smart digital interactive service sites. The activities of guidance and counseling services through intelligent digital interactive service sites follow the mandate of the international counseling service association, which can maintain confidentiality and are easy to use.

The smart digital interactive service product has a "discussion" feature that allows students to form a community of support where they can share experiences, get emotional support, and overcome problems together. The experience and perspective of their friends can help them understand the problem and find a solution. The discussion feature supports multi-directional interaction, where students and counselors can interact with each other and with multiple teachers at once. This creates an ever-changing environment and where people work together. Students can undertake projects or group assignments, work together to find solutions, and share helpful resources.[54]

Previous studies on the benefits of technology in guidance and counseling services are in line with the findings of this study. For example, one of the studies conducted by M.G. Shahamabadi, *et al*.[31] during the COVID-19 pandemic at Imam Jafar Sadegh Hospital in Meybod, Iran where a study was conducted on 80 women with a history of miscarriage by providing them with online counseling. The results of the study showed that online counseling was effective in reducing the level of anxiety felt by women after miscarriage. In addition, a study conducted by Ramezankhani, *et al*. examined 184 health workers and 184 clients at the Puskesmas of TUMS (Tahenran University of Medical Sciences) from January 20 to May 21, 2021 by providing them with online training and counseling. The results of the study show that online counseling for a healthy lifestyle in primary health care can control the risk factors of non-communicable diseases in clients and improve online counseling skills in health workers.[32]

This research also supports research conducted by Rahmati, which shows that there is an increase in awareness and attitudes towards fertility and fertility counseling skills of health workers, both using face-to-face training methods and through virtual training.[55] In addition, Eysenbach stated that online communities and support groups can provide significant psychosocial benefits.[56] It was also found in the study, where students reported the benefits of the group discussion feature, which allowed them to interact in real time with counselors and peers.

Limitation and recommendation

In terms of guidance and counseling services in universities, the development and implementation of smart interactive services has many advantages, namely 1) Scalability where when compared to face-to-face services, digital services are cheaper. This allows more students to receive counselling support, 2) Personalization where interactive technology allows services to be better personalized to meet the unique needs of students, 3) Data Collection where digital platforms make data collection and analysis faster, which makes it easier for counsellors to track student progress and tailor interventions in real time.

Based on this study, some suggestions for the next research. To increase the generalization of research results, it is necessary to conduct research with a larger and more diverse sample. Long-term research is needed to observe the sustainable impact of digital guidance and counseling services in higher education.

Conclusion

The Smart Digital Interactive Service product design is geared to the guiding and counseling service strategy of basic, responsive, and system support services. Smart Digital Interactive Service products are created by merging websites and applications, which may be accessed via http://smartcounseling.iaincurup.ac.id/pages. Smart Digital Interactive Service products are accessible to administrators and users, who include counselors, students, and general users.

The data shows that the accessibility of guidance and counseling services through digital platforms is increasing, and the level of student satisfaction with guidance and counseling services is also increasing. Users say that interactive features such as discussion forums, chats, and video calls help them feel more supported and more actively involved in the process of guidance and counseling services.

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Conflicts of interest

There are no conflicts of interest.

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