

GCNA Development: Integrated Psychological Assessment Application for Diagnosis and Prognosis of Service Needs in Guidance and Counseling Laboratories

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Abstract. The Educational Psychology and Counseling Laboratory at Medan State University has a strategic role in supporting guidance and counseling activities in the university environment, such as the implementation of assessments and the provision of counseling services. Along with technological advances, various aspects of life, including the implementation of psychological assessments, are required to continue to innovate—shifting from paper-based tests to computer-based or online tests. This transformation aims to increase efficiency in the process of working on and processing data. This research is a type of Research and Development (R&D) research, which is a method used to produce a particular product while testing its level of effectiveness. The product developed in this study is the "GCNA" application, which is designed as an online psychological assessment tool to assist the process of diagnosing and prognosticating the need for guidance and counseling services at the Educational Psychology and Counseling Laboratory. The subjects in this study were students of the Guidance and Counseling study program who were randomly selected through the Random Sampling technique. Data analysis was carried out using the Quantitative Descriptive approach.

Keywords: GCNA, Psychological Assessment Application, Diagnosis, Prognosis, and Guidance Counseling Laboratory

1 Introduction

The development of technology at the global level has had an impact on various aspects of life, including economics, politics, culture, art, and education. This development is something that cannot be avoided, because technology grows along with the advancement of science. Every innovation that is born aims to provide a positive impact on human life. These innovations offer various conveniences and introduce new ways of carrying out daily activities. This is especially felt in the realm of information technology which has experienced much progress in the last ten years. Although basically these innovations are made for good purposes, there is still the possibility that technology can be misused for negative interests, which is known as disruption. In education, disruption in all levels of life makes the entire world of education have to adapt to existing technological trends. This reality has resulted in the world of education including the

Counseling Guidance Study Program Laboratory, State University of Medan being under pressure to overcome several changing forces.

The Guidance and Counseling Laboratory of Medan State University has an important role in supporting guidance and counseling activities in the Medan State University environment. The functions and roles of the laboratory can include the following: 1) Place for Guidance and Counseling Practice: The Guidance and Counseling Laboratory is often a place where guidance and counseling practices are carried out. Includes counseling sessions, guidance groups, and other activities that support the development of students' interpersonal and life skills; 2) Student Monitoring and Assessment: This laboratory provides facilities for conducting psychological assessments and evaluations of students. By using tests, observations, and other assessment tools, counselors can understand the needs and characteristics of students, helping to formulate appropriate service recommendations; 3) Guidance and Counseling Program Development: The Guidance and Counseling Laboratory plays a role in developing effective guidance and counseling programs. This includes the preparation of educational materials, workshops, and other activities that can help students develop personal, social, and academic skills; 4) Provision of Information Resources: The laboratory can serve as an information center that provides literature, books, and other resources related to guidance and counseling. This helps students, parents, and educational staff to obtain relevant and accurate information.

In the context of psychological monitoring and assessment, the Guidance and Counseling Laboratory is aware of a number of changes in its implementation. These changes include: (a) the implementation of assessments that were previously carried out in class can now be done anywhere and anytime, (b) the use of paper media has shifted to an online format or digital channel, and (c) from the use of physical facilities to the use of network-based facilities, as explained by Rosenberg [1]. These changes are the impact of the era of disruption (Industry 4.0) which is marked by a shift from conventional technology to digital technology. This shift not only changes the assessment model used, but also forms a new psychological assessment ecosystem that is more innovative, complex, and dynamic. [2] so as to make the organization's work process more effective and efficient. In relation to this, technological developments have encouraged the psychological testing process to be carried out online via the internet, and have been made very familiar with online information technology and communication.

In fact, the Guidance Counseling Laboratory which is competent to provide psychological assessment services does not yet have an online assessment application. Until now, all psychological measurement test tools are still carried out manually or conventionally. From these facts, an initial study has been conducted regarding the shortcomings and weaknesses of implementing psychological measurements manually, including: 1) Cost and Time: the conventional test administration process can be time-consuming and costly, especially if it involves printing, direct supervision, or intensive face-to-face interaction; 2) Limited Access: Participants must be physically present to take a conventional test, which can create accessibility constraints, especially for those who live in remote locations or have limited mobility; 3) Lack of Flexibility: Conventional tests may be less flexible in time and place. This can be an obstacle for participants who have busy schedules or have difficulty attending test sessions at certain times; 4) explaining Measuring Spontaneous: Some aspects of behavior Spontaneous behavior or reactions in real situations may be difficult to measure with conventional tests that tend to focus on structured questions and responses; 5) Limitations in Mass Data Collection: Conventional tests may be difficult to adopt on a mass scale, especially when involving a large population, as the administration process requires more human resources and time.

Seeing the condition of increasingly rapid technological developments like today, the development of psychological assessments should be carried out online. This assessment will

later be combined with the sophistication of information technology, such as being developed in the form of online forms based on applications [3] so that the limitations and weaknesses of its implementation can be minimized. The psychological assessment developed is Guidance and Counseling Need Assessment (GCNA). GCNA refers to the process of collecting, interpreting, and synthesizing information with the aim of making decisions that refer to knowledge about the difference between desired/ought (should/ought to) or expected conditions and existing conditions (as is).

1.1 Instrumentation Needs Assessment

According to Lampah [5], assessment is a process to identify individual abilities, obstacles or difficulties faced, understand the background of the emergence of these obstacles, and determine the type of assistance needed by the individual. Information obtained from the assessment results becomes the basis for designing a learning program that suits the child's needs. Needs assessment is the main task as well as the initial stage that must be carried out by the counselor in compiling the Guidance and Counseling Program. Therefore, needs assessment plays a central role in the development of the program as a whole. In implementing counseling strategies, needs assessment plays a very important role in determining the next steps. Putro [4] states that the general stages in the counseling process include: building relationships, problem assessment, formulating goals, choosing goals, determining strategies, implementing strategies, conducting evaluations and follow-ups, and the termination stage. From this explanation, it can be concluded that assessment is a crucial stage that must be carried out before setting goals in the counseling process. In addition, the Assessment is carried out in various methods used, Assessment is very important. In the Social Research Journal, Need Assessment was also carried out, namely according to Zokaefar, Mirbeigi, Eskash, Dousti, Sedaghatpishie & Shafii [7] explaining that in their research they also needed Assessment steps in collecting data before conducting research. This shows how important Need Assessment is in the implementation in all aspects. Likewise in the implementation of Guidance and Counseling.

According to Prayitno [6], instrumentation application is one of the supporting activities in guidance and counseling which functions as a basis for determining the type and material of services to be provided. The purpose of instrumentation according to Thorin (in Muskarno, 2021) is to obtain information related to students as clients. When connected with the function of understanding in guidance and counseling services, the application of instrumentation functions to obtain data regarding the potential of students (clients) which include talents, interests, personality and social environment, as well as personal problems. Data collection regarding student needs and problems through instrumentation application activities can be done by utilizing various instruments, both in the form of tests and non-tests. The development of various non-test instruments carried out by BK teachers/Counselors by utilizing computer programs has produced various computer-based instrumentation applications to assist in the implementation of guidance and counseling services. The various computer-based instrumentation applications include the Developmental Task Analysis application which is used to identify the level of development of high school students in Singkawang City in terms of the foundation of religious life [8]; IKMS software in Guidance and Counseling management planning [9] and the Problem Revealing Tool which has been further developed in the form of a Microsoft Access-based application and drilled on School Counselors. Thus, the conclusion

is that the Need Assessment Instrumentation is a test tool used to collect data on certain client conditions which is used for information needs of clients and parties in need.

1.2 Web Based Application

According to Putri [11], an application can be interpreted as a program used by users to run an activity on a computer system. Meanwhile, the term mobile refers to the ability of a device to move easily without disrupting its function, such as a mobile phone that allows users to stay connected without being disconnected when changing locations. Thus, a mobile application system is an application that can still be used optimally even though its users move from one place to another without experiencing disruption or disconnection of communication. Meanwhile, Suryawinata [12] explains that the web is a facility that allows the presentation of data in various formats such as text, images, sound, and other multimedia via the internet network. The World Wide Web (WWW) itself is a large network consisting of thousands of computers divided into two main roles, namely client and server, which are connected through special software to form a client-server network system. In WWW operations, two very important main components are web server software and web browsers.

Palandi [13] explains that web-based applications are computer programs that utilize browsers and web technology to perform various functions over the internet network. This type of application usually uses a combination of server-side scripts, such as Aspects and PHP, to handle the process of storing and retrieving data. On the other hand, client-side scripts such as JavaScript and HTML play a role in presenting information interactively to users. With this technology, users can interact directly with website owners through various features such as online forms, comment columns, and content management systems. In addition, web-based applications allow users, including employees, to create documents, share data, collaborate on projects, and access and edit the same document using various devices—even from different locations.

Enjelina [14] Mentions that web-based applications have several characteristics. This will be shown in the points of advantages and disadvantages of this web-based application. The advantages of web-based applications include:

- a. Web-based applications can be run on various platforms, both operating systems and devices are different as long as the browser application is compatible
- b. Everyone can access the same version of the application, this will eliminate application software compatibility problems
- c. This web-based application is not installed on the Hard Drive or hard disk in the computer. This will solve the problem of hard disk space that usually occurs
- d. Web-based applications reduce the level of piracy of subscription software, for example SaaS
- e. Web-based applications reduce the maintenance costs required for both the company and the client.

Web-based applications also have several weaknesses, including:

- a. To access web-based applications, we generally have to be online or connected to a network. Although there are some web-based applications that can be run on a local server. This will be a little difficult for application users who do not have internet access.

- b. The speed of accessing this web-based application again depends on how fast the client's internet access is. The faster the internet connection, the faster access to web-based applications will be, and vice versa.
- c. Web-based applications are sometimes designed to be accessed optimally in certain browsers. One example is a web-based application that has a Flash file in it. In some browsers, this application cannot run optimally.
- d. Security is still not 100% guaranteed.

2 Research Method

This study uses a development research approach known as Research and Development (R&D). This method aims to produce a particular product while testing the effectiveness of the product. According to Borg and Gall [15], development research in education is a process used to design and validate educational products. This process, often referred to as an R&D course, includes several stages, namely reviewing research results that are relevant to the product to be developed, designing the product based on these findings, conducting field trials according to the context of product use, and making revisions based on deficiencies found during testing. In a more systematic R&D program, this cycle will continue to be repeated until the results of the field trial indicate that the product has met the objectives that have been clearly formulated in the form of behavior [11]. The research and development conducted in this study aims to produce a Web-Based Need Assessment Instrumentation Application that will be used in the Guidance and Counseling Laboratory, Faculty of Education, State University of Medan. The product developed will go through a series of research and refinement stages in order to produce an application that is useful and feasible to use.

3 Results and Discussion

3.1 Define

3.1.1 Initial analysis (*Front-end Analysis*)

Initial analysis was conducted to determine the basic problems in developing a website-based need assessment instrumentation application in the Faculty of Education Universitas Negeri Medan, Guidance and Counseling laboratory. At this stage, facts and alternative solutions emerged, making it easier to determine the initial steps in developing an appropriate application to be developed. At the initial analysis stage, the researcher conducted interviews with Guidance and Counseling students, Lecturers at the BK Study Program. The results obtained were:

- a. The implementation of student assessments carried out by the Guidance and Counseling laboratory still uses paper.
- b. Data processing and analysis of results are carried out manually so that it takes a relatively long time.
- c. The Guidance and Counseling laboratory realizes that assessments will be more effective if they use technology applications
- d. Assessment result data is usually still stored in paper-based document files that are very likely to be lost
- e. Implementation of paper-based assessments usually requires quite a lot of funds

3.1.2 Student Analysis (Community Analysis)

Analysis of students is an important step that needs to be taken in the early stages of planning. This analysis process is carried out by observing the characteristics of students in the Guidance and Counseling study program. In this analysis, the main considerations are the level of smartphone usage and the availability of internet access both individually and in groups. Based on the results of observations in the field, it was found that:

- a. All students use smartphones.
- b. Students have the ability and knowledge to operate mobile phone devices.
- c. The location of the student's residence or activities greatly supports internet access because of the availability of networks from various service providers.

3.1.3 Task Analysis

Task analysis aims to identify the main tasks that will be carried out by the Guidance and Counseling Laboratory as the main unit of the BK Study Program in supporting practical scientific activities. Task analysis is an analysis of student expectations related to the application to be developed.

3.1.4 Concept Analysis

Concept analysis is conducted to identify and understand the content of the application to be developed. This stage is a crucial part in ensuring that the development of features and menus in the application is in accordance with the principles that support the achievement of goals. This analysis also aims to make the application an effective means of meeting the needs and expectations of students as users of the Guidance and Counseling Laboratory.

3.1.5 Objective Analysis (Determining Objectives)

Objective analysis was conducted to determine the indicators of success in developing a website-based need assessment instrumentation application in the Faculty of Education Universitas Negeri Medan Counseling Guidance laboratory. By listing the objectives of developing a website-based need assessment instrumentation application in the Faculty of Education Universitas Negeri Medan Counseling Guidance laboratory, researchers can find out what studies will be displayed in the applications, and determine how much the objectives of developing a website-based need assessment instrumentation application in the Faculty of Education Universitas Negeri Medan Counseling Guidance laboratory have been achieved.

3.2 Design

The purpose of this stage is to prepare a prototype for the development of a website-based needs assessment instrumentation application in the Faculty of Education Universitas Negeri Medan Counseling Guidance laboratory. The format of the existing device and the one that has been developed first. After getting the problem from the definition stage, the next step is the planning stage. This planning stage aims to design application media that can be used in the website-based needs assessment instrumentation application in the Faculty of Education Universitas Negeri Medan Counseling Guidance laboratory. This planning stage includes:

3.2.1 Criterion-Test Construction

The preparation of test instruments is based on the preparation of application objectives that are the benchmarks for developing website-based need assessment instrumentation applications in the Faculty of Education Universitas Negeri Medan Guidance and Counseling laboratory. This study used a material expert questionnaire, a media expert questionnaire, and a trained participant questionnaire to test whether the application was good or not.

Table 1. Application User Response Instrument

No	Aspect	Question	Score			
			1	2	3	4
1	Software Engineering	a. Usability (simple application and easy to operate) b. Reliability (application is reliable, not easy to crash and lag, responds to commands) c. Application can be accessed from various devices d. Application can be accessed from various search engine software e. Application viewport display can adjust to the device to access				
2	Assessment Material	a. The material is in accordance with the needs of the Guidance and Counseling Laboratory b. The instrument items provided measure current psychological aspects c. The instruments provided are easy to understand d. The application provides an opportunity to be active in				
3	Visual Communication	a. The application layout is easy to understand b. The layout is attractive c. The color combination is harmonious d. Provides encouragement in the orientation service process e. Provides encouragement for independent learning				

Table 2. Media Expert Instrument

No	Aspect	Question	Score			
			1	2	3	4
1	Software Engineering	a. The application responds well				
		b. The application does not hang easily				
		c. Can be maintained				
		d. <i>The application can be accessed from various search engine software.</i>				
		e. The application viewport display can be adjusted to the device to access it				
		f. Can be installed without a special device				
		g. Can be reused				
2	Visual Communication	a. Communicative				
		b. Creative and innovative				
		c. Attractive layout				
		d. Easy to understand application typography				
		e. Easy to understand navigation				
		f. Clear application icon				

3.2.2 Format Selection

The selection format is done in the initial step. The selection of the format is done so that the selected format is in accordance with social norms that are oriented to the function and role of the Faculty of Education Universitas Negeri Medan Counseling Guidance laboratory. The selection of the presentation form is adjusted to the application used. The selection of the format in the development consists of designing the contents of the website-based need assessment material in the Faculty of Education Universitas Negeri Medan Counseling Guidance laboratory, selecting the application used, creating an application design, which includes layout design, images and writing. The results at this stage are:

- a. GCC Learning Needs Assessment containing: Home, Learning, Career, Personal, Social, Vision and Mission, Organization Structure, Parties Involved, Facilities and Amenities.
- b. Register Now
- c. Home contains application description
- d. Learning: Contains a Description of Individual Development Assessment in the Field of Learning
- e. Career: Contains a Description of Individual Development Assessment in the Field of Career
- f. Personal: Contains a Description of Individual Development Assessment in the Field of Personal
- g. Social: Contains a Description of Individual Development Assessment in the Field of Social

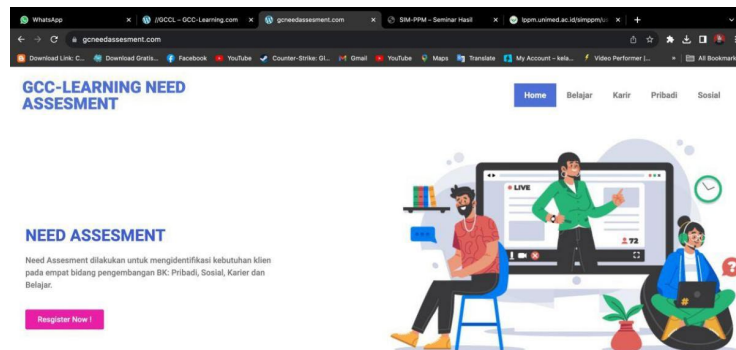


Fig. 1. Application View

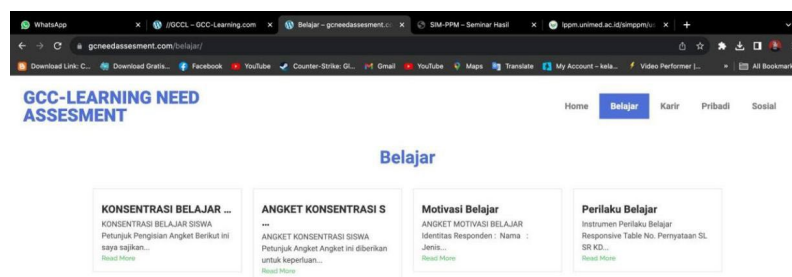


Fig. 2. Features on The Application

3.3 Develop

The development stage is a process to create a product that is carried out through two main steps, namely: (1) evaluation by experts which is then continued with improvements, and (2) testing the product results of the development (development testing). This process is described in the development scheme of a web-based needs assessment application implemented in the Guidance and Counseling Laboratory, Faculty of Education, State University of Medan.

3.4 Expert Validation

Validation by experts aims to assess the feasibility of the material in the application before the trial phase is carried out. The results of this validation process are the basis for revising the initial product. The application that has been developed will be evaluated by expert lecturers in the field of material and media to determine the extent to which the application is feasible to be implemented. The findings from this validation are then used as input in refining the application. After the refinement process, the application will be tested on a limited basis to users at the field trial stage.

3.5 Development Testing

After expert validation was carried out, a limited field trial was carried out to determine the results of the application of website-based need assessment instrumentation in the Faculty of Education Universitas Negeri Medan Counseling Guidance laboratory.

4 Conclusion

The research product developed in this study is the “GCNA” application that can be used as an online psychological assessment in diagnosing and predicting the need for guidance and counseling services in the Guidance and Counseling Laboratory. The Integrated Online Psychological Assessment (GCNA) application can be used for the Diagnosis and Prognosis of Guidance and Counseling Service Needs in Guidance and Counseling Laboratory produced in this study will provide a direct contribution to the performance of the Guidance and Counseling Laboratory by becoming a means or facility provided by the Guidance and Counseling Laboratory to students and other users.

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