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Personalized Cognitive Counseling Process to Promote Digital Health

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Abstract
The objective of this research was as follows: 1) to synthesise the Personalized Cognitive Counseling Process to Promote Digital Health. 2) to develop the Personalized Cognitive Counseling Process to Promote Digital Health. 3) to evaluate the Personalized Cognitive Counseling Process to Promote Digital Health. The documentary research method was used in this study. 4) to adapt the Personalized Cognitive Counseling model for Digital Health. The results showed a model of Personalized Cognitive Counseling Process to Promote Digital Health which consisted of four steps: Step 1: Synthesis of the Personalized Cognitive Counseling Process to Promote Digital Health. This includes the following three components: Personalized Learning, Cognitive Learning and Counseling. Step 2: The development of the Personalized Cognitive Counseling Process to Promote Digital Health. The researchers found that a model of Personalized Cognitive Counseling Process to Promote Digital Health consists of five processes: 1) Understanding 2) Design 3) Development 4) Choosing and Using Tools 5) Evaluation. Step 3: The evaluation of the Personalized Cognitive Counseling Process to Promote Digital Health. The results of the evaluation in terms of suitability revealed that the design process was deemed to be at the highest level. Step 4: Adapting Result of the Personalized Cognitive Counseling model for Digital Health

Keywords: Personalized Learning, Cognitive Learning, Counseling

1. Introduction

Nowadays, technology development is changing rapidly. It is also complicated. Access to health services is becoming increasingly complicated, causing people to immediately adapt to those changes. (Li et al., 2020) As can be seen from the situation during the COVID-19 outbreak, technology development directly and indirectly affects the lives and well-being of Thai people in many dimensions. both health behaviors Study life - work travel and family relationship. These aspects all affect our quality of life in both the short and long term. (Dunn et al., 2019) People have a low level of self-health management and have insufficient knowledge of health care. This results in people being unable to manage themselves. and can change the behavior of health to be healthy. People want and expect to know if they are sick or have any health problems. What needs to be done to heal the individual

is important with regard to that individual's state of health. People have the right to have access to health and wellness information. including the right to receive accurate and adequate health information in order to provide accurate, safe, and diverse health care options.

In addition, in a hyper-connected society full of sophisticated communication processes, educational operations must adapt to the current era and the conditions w live in. That is counseling that has some form of mentoring must be introduced for best results. Personalized Learning can provide and customize learning approaches to meet learners' needs. (de Campos & Cazella, 2019) This is based on a knowledge base, but is not attached and confined to the framework. There are levels of difficulty that learners can aspire to according to their interest level. Students can learn in a way that is suitable for each of them individually. (Bishop et al., 2020) The Cognitive Counseling Process provides guidelines for patient counseling and treatment (Widya Kirana et al., 2022) which can produce positive outcomes. It can guide students to become lifelong learners in the digital world, who are capable of self-controlled learning (Yang et al., 2017).

2. Objectives

1) To synthesis the Personalized Cognitive Counseling process to Promote Digital Health
2) To develop the Personalized Cognitive Counseling process to Promote Digital Health
3) To evaluate the Personalized Cognitive Counseling process to Promote Digital Health
4) To adapt the Personalized Cognitive Counseling model for Digital Health

3. Literature Review

3.1 Personalized Learning

Personalized learning is a learning strategy and teaching approach that has been adapted to suit the needs of the learner (Chen., 2021) learner by being customized to the strengths and needs of each student. each student unit and flexibility in teaching. (Shemshack et al., 2020) Strategies can be integrated with a personal learning. Each learner is different, and experiences their own experience, knowledge, and understanding (Tang et al., 2020), allowing more flexibility for both learners and teachers. (Roberts-Mahoney et al., 2016) Learning methods and speeds may vary from student to student. However, the final goals and educational standards do not differ. Each student must reach a topic proficiency level by the end of the unit or academic year. (Bishop et al., 2020) Learning objectives, teaching approaches, and teaching content and grading may vary according to the needs of the learner. (Walkington & Bernacki, 2020) The aim is to facilitate the academic success of each student. This is done by first determining the needs, interests and learning aspirations of each student teaching content and grading may vary according to the needs of the learner. A more or less tailored learning experience is then provided for each student (Raj et al., 2021), responding to their particular abilities, interests and needs. This is a practice that adjusts the pace and focus of teaching to meet the needs and goals of each learner. It allows students to speed up or spend additional time according to their level of expertise. Learners work with teachers to set both short- and long-term goals. (Shemshack & Spector, 2021) This process allows learners to take ownership of their own learning. (Bernacki et al., 2021) Learner's work with teachers to set both short- and long-term goals. This process allows learners to take ownership of their own learning. (McCarthy et al., 2020) Teachers should strive to provide a learning environment such that students are able to learn on their own and have diverse learning opportunities. Creating personalized learning involves using of advance innovation such as AI recommendations, machine learning, learning paths, and natural language processing. (Tang et al., 2020)

3.2 Cognitive Learning

Cognitive learning theory deals with the processes involved in learning. (Obergriesser & Stoeger, (2020) It relates to the skills, knowledge, memories, and relevant information that students have obtained in the past. (Palee et al., (2020) It is an proactive learning model that aim at helping learners learn how to maximize their learning ability. It makes it easy to connect with modern information to existing ideas. (Tang et al., 2020) It focuses on using one's brain more efficiently, and to understand the process of cognitive learning. (Thuneberg et al., 2018) Learners have

the ability to absorb and store information through experiences, thoughts and feelings. (Park, & Yun, 2017) Individual learning is influenced by internal and external factors. Learners have the ability to create new understandings based on the information they will receive. (Chen et al., 2018) When learning new things, learners are active participants in the process, with the use of skills, knowledge, experience, and relevant old information of learner. Personalized process and build their self-understanding about various topic based on the experiences and knowledge that the learners have experienced. (Palee et al., 2020) Cognitive learning theory combines learning and cognition to effectively describe the processes involved in learning. (Thuneberg et al., 2018) instructors apply cognitive learning theory by supporting self-review and explaining their reasons. Applying cognitive learning theory to work should take a similar approach, but is implemented differently. (Karapakdee & Piriyasurawong, 2022) Cognitive learning theory can be influenced by both external and internal factors. If the cognitive process works normally, it will be easier to learn. However, if something happens through cognitive processes, difficulties can arise. (Choi et al., 2021)

3.3 Counseling

Counseling means building a good relationship between the adviser and the counselor. Counselors use a range of skills to facilitate positive change in their counselors. (Stonerock & Blumenthal, 2017) They do this through the use of deliberate counseling techniques and an understanding of human nature. (Whicker, J. J., 2020) To aim of counselling is to identify the source of problems and resolve them by making decisions in terms of planning and taking action in order to improve and enhance their status. (Carpenter et al., 2016) as well as being able to find solutions to those problems on their own with a degree of flexibility. (Lancaster & Stead, 2017) Counseling involves helping people make necessary changes in their thinking, feelings, and behavior. It is a goal-driven collaborative process that involves a nonjudgmental, supportive mentor who works with the mentee to allow the mentee to tell their story. It involves setting a possible goal with the aim of achieving it. (Pisano & Miller, (2018) However, consulting does not come in a ready-made form. Typically, each session is tailored to individual problems. (Lambie et al., 2018) This involves helping the counselor see things more clearly, which may result from a consideration of different perspectives. (Hategan, V. P., 2021)

3.4 Personalized Cognitive Counseling

Personalized Cognitive Counseling involves building a good relationship between the counselor (Stonerock & Blumenthal, 2017) and the client using a learning model that focuses on using the brain effectively It can maximize one’s brain's potential to facilitate positive change. (Tang et al., 2020) The process focuses on how the brain processes information and how learning takes place. (Mierdel & Bogner, 2021) his is done through a survey to understand the cause of the problem and the needs of the client. (Stonerock & Blumenthal, 2017) In addition, it encourages the client to be able to find solutions to those problems on their own in a flexible manner, by determining their needs, interests, and inspirations with regard to learning, with an emphasis on flexible individual educational experiences (Lancaster & Stead, 2017) to meet the needs and goals of each client. (Raj et al., 2021) Personalized Cognitive Counseling consists of 5 steps as follows:1) Understand how learners learn best, 2) Designing a personal learning environment 3) Develop lessons 4) Choose and use tools, resources, and strategies 5) Evaluate learning

4. Research Method

4.1 Scope of the Research

This research consisted of the use of 21 experts in 3 areas: educational technology experts, information and communication technology experts, and health care experts, to assess and express opinions on the learning model. The research used in-depth interviews with experts incorporating detailed questions with regard to each issue, based on undergraduate students from Bansomdejchaopraya Rajabhat University, obtained by simple random sampling.

4.2 Research Process

Step 1: Synthesis of the Personalized Cognitive Counseling Process to Promote Digital Health.
This involved studies of personalized learning, cognitive learning and counseling from documents, academic journals, concepts, textbooks, and theories of relevant research papers, including analysis and synthesis of the data.

Step 2: Development of the Personalized Cognitive Counseling Process to Promote Digital Health.
From the synthesis step we has developed the Personalized Cognitive Counseling model from analysis and synthesis of relevant data, documents, and research.

Step 3: Evaluation of the Personalized Cognitive Counseling Process to Promote Digital Health.
Assessment as to the suitability of the Personalized Cognitive Counseling Process to Promote Digital Health was based on an in-depth interview with the 21 experts, divided into 3 groups - educational technology experts, information and communication technology experts, and health care experts. This research aimed to determine the validity of the process by analyzing the Index of Item Objective Congruence (IOC) to complete the content of the Personalized Cognitive Counseling Process to Promote Digital Health.

Step 4: Adapting the Personalized Cognitive Counseling model for Digital Health
The researchers studied the effect of using the Personalized Cognitive Counseling model by experimental group-control group research design, with the sample evaluation stage before using and evaluation stage after using. The research tool was the Digital Health Assessment. Thereafter, the researchers compared digital health before and after use using an independent T-test, with statistical significance set at the .01 level.

5. Results

5.1 Conceptual Framework

The synthesis of personalized learning from 14 relevant document, theories, and research is as detailed in Figure 1.

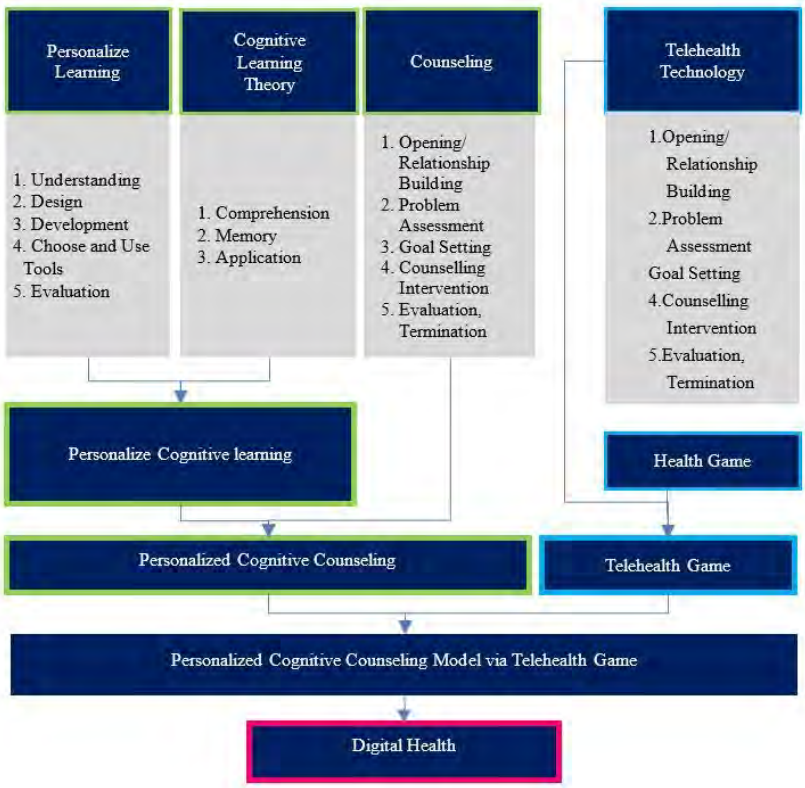

Figure 1: Conceptual Framework

As can be seen from Figure 1, the Personalized Cognitive Counseling Process to Promote Digital Health consists of 3 input elements from Personalized Cognitive Counseling in the form of personalized learning, cognitive learning theory and counseling. The tool that the researchers have chosen for this research is Telehealth Game consists of Telehealth Technology and Game for Health to promote Digital Health.

5.2.1 Synthesis of Personalized Learning.

The synthesis of personalized learning from 14 relevant document, theories, and research is as detailed in Table 1.

Table 1: Synthesis of Personalized Learning

Personalized Learning	Researcher													
	(Roberts-Mahoney et al., 2016)	(Zhang et al., 2020)	(Shemshack et al., 2020)	(Bernacki et al., 2021)	(Shemshack & Spector, 2021)	(McCarthy et al., 2020)	(Tang et al., 2020)	(Bishop et al., 2020)	(Chen., 2021)	(Raj et al., 2021)	(Walkington & Bernacki, 2020)	(Pardo et al., 2018)	(Xie et al., 2019)	(Pane et al., 2017)
Understand how Learners Learn Best	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Design	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Development	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Facilitate Driving and Supporting Questions						√					√		√	
Choose and Use Tools, Resources, and Strategies	√		√	√	√	√	√	√	√	√		√	√	√
Evaluation	√	√	√	√	√	√	√	√	√	√	√		√	√

According to Table 1, this consists of 5 elements: 1) Understanding how learners learn best, 2) Design, 3) Development, 4) Choosing and using tools, resources, and strategies, 5) Evaluation.

5.2.2 Synthesis of Cognitive Learning.

The synthesis of cognitive learning from 10 relevant document, theories, and research is as detailed in Table 2.

Table 2: Synthesis of Cognitive Learning

Cognitive Learning	Researcher									
	(Wu et al., 2021)	(Karapakdee & Piriyasurawong, 2022)	(Palee et al., (2020)	(Chen et al., 2018)	(Mi et al., 2020)	(Shi et al., 2019)	((Mierdel & Bogner, 2021)	(Thuneberg et al., 2018)	(Park, & Yun, 2017)	(Obergriesser & Stoeger, (2020)
Comprehension	√	√	√	√	√	√	√	√	√	√
Memory		√	√	√	√	√	√	√	√	√
Positive and Negative Reinforcement	√						√			
Application	√	√	√	√	√	√	√	√	√	√
Evaluate			√	√		√				
Create			√	√						

According to Table 2, this consists of 3 elements: 1) Comprehension, 2) Memory, 3) Application.

5.2.3 Synthesis of Counseling.

The synthesis of counseling from 9 relevant document, theories, and research is as detailed in Table 3.

Table 3: Synthesis of Counseling

Counseling	Researcher								
	(Stonerock & Blumenthal, 2017)	(Lambie et al., 2018)	(Hategan, V. P., 2021)	(Whicker, J. J., 2020)	(Terrell & Osborne, 2020)	(Carpenter et al., 2016)	(Pisano & Miller, (2018)	(Lancaster & Stead, 2017)	(Dehlendorf et al., 2017)
Opening/ Relationship Building	√	√	√	√	√	√	√	√	√
Problem Assessment	√	√	√	√	√	√	√	√	√
Goal Setting			√		√	√	√	√	√
Counselling Intervention	√	√	√	√	√	√	√	√	√
Termination and follow-up	√				√	√			
Empowering Ability				√					
Evaluation/ Termination			√		√	√	√	√	√

According to Table 3, this consists of 5 elements: 1) Opening/ relationship building, 2) Problem Assessment, 3) Goal setting, 4) Counselling Intervention 5) Evaluation/ Termination.

5.2 The development of the Personalized Cognitive Counseling process to Promote Digital Health

The Personalized Cognitive Counseling Process to Promote Digital Health consists of 5 steps.

1) Understanding

Understanding relates to the understanding of the learner. Measuring each learner's grades is done by building relationships with individual students to build trust. This allows them to disclose preliminary information. They can then explore and understand problems, their causes, and their needs in such a way as to engage learners in exploring the problems that affect them. All learners participate in an appropriate learning experience. This could include whole class or small group activities led by the teacher. The latter can involve working individually with learners or in groups, and engaging students in digital learning activities

2) Design

Designing a Personal Learning Environment involves determining the situation of the person, the environment, and the behavior of the learners. Such a process involves positive and negative reinforcement. It involves assessing the problems students are facing by putting them at the center of the learning process. Determine the student's grades type of learning experience. It is necessary to determine the types of information that can be collected. For example, finding out when students participate in small group activities. Instructors may also ask objective, open-ended questions that will help refine the upcoming elements of the lesson as the technology can continuously measure performance in real time.

3) Development

It is necessary to develop lessons as designed. This will include lesson planning, and teaching and learning in the classroom as it has been planned. This includes the use of teaching materials and various materials and equipment in accordance with the learners' progress. It can relate to concepts, statements of knowledge, attitudes, and process skills in lesson development which are general processes that can be used for a variety of purposes. It will be necessary to adjust the procedures of the operation to suit each learner's context by maintaining the core principles of the process. It will involve determining the issues of lesson development arising from the problematic state of thinking or learning of the learners in terms of actual teaching in the classroom The teacher sets goals or issues for developing lessons. This is done by considering the student's problem situation based on the information available and aiming at the goal of developing lessons that improve the learners' learning.

4) Choosing and Using Tools

Selecting and using tools, resources, and strategies for teaching and learning consists of selecting a method and integrating tools, applications, and resources to design instruction and universal learning strategies that support learners in achieving their learning goals. This is done by considering the congruence with the personalized learning experience of each individual learner. The learning experience can be personalized by the instructor or with the use of a personal learning system involving digital technology. Alternatively, it can consist of a combination of both approaches, with learners adjusting the approach themselves.

5) Evaluation

Learning is key for learners who are responsible for their learning. Instructors will design an assessment strategy which will include suggestions. This gives students the opportunity to reflect on what they are learning and how it applies to other formats. This in turn will help them develop the problem-solving skills they need. It will create new connections between what the students are learning in evaluating individual learners. When it is a unique learning Teachers use digital technology to assess learners including a unique consulting channel to improve the learner experience, as well as improved technology-based systems designed to support personalized learning.

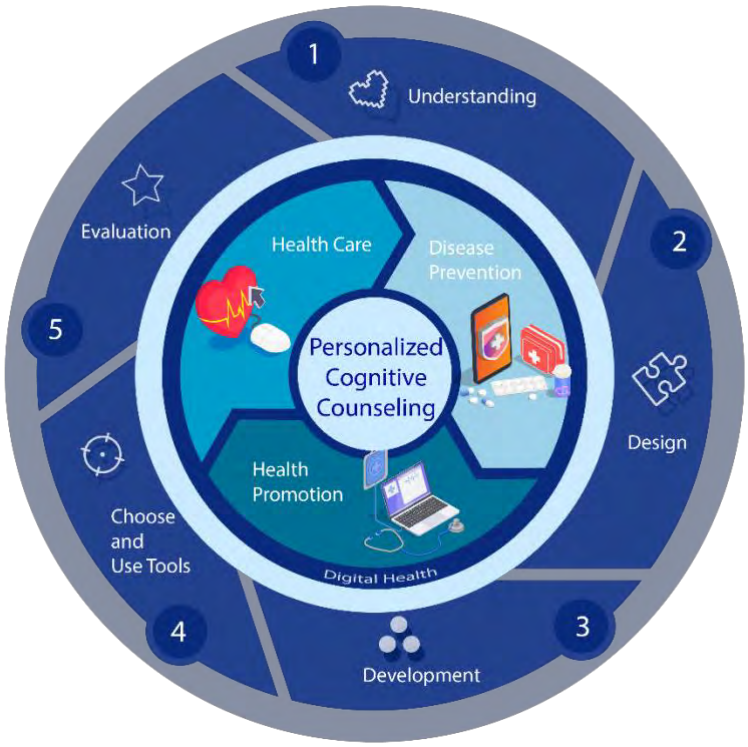

Figure 2: A model of Personalized Cognitive Counseling process to Promote Digital Health

5.3 The Evaluation Results.

According to the literature review related to personalized learning, cognitive learning theory and counseling, the results of the Personalized Cognitive Counseling Process to Promote Digital Health are as shown in Table 4.

Table 4: The result of the suitability of the Personalized Cognitive Counseling process to Promote Digital Health

Details	$\bar{x}$	*S.D.*	Suitability
1. Understanding	4.60	0.63	Highest
2. Design	4.87	0.35	Highest
3. Development	4.80	0.41	Highest
4. Choose and Use Tools	4.60	0.83	Highest
5. Evaluation	4.73	0.46	Highest
Average	4.72	0.56	Highest

The results with regard to the suitability of the Personalized Cognitive Counseling Process to Promote Digital Health indicated that overall, the experts were of the opinion that the process was appropriate at the highest level ($\bar{x}$ = 4.72, S.D. = 0.56). When considering each step, it was found that the highest satisfaction was with the design process (4.87) with a standard deviation of 0.35. This was followed by the development process (4.80) with a standard deviation of 0.41. The satisfaction with the evaluation process achieved 4.73 with a standard deviation of 0.46. The satisfaction with the understanding process achieved 4.60 with a standard deviation of 0.63 while the Choose and Use Tools process attained 4.60 with a standard deviation of 0.83.

5.4 Adapting Result of the Personalized Cognitive Counseling model for Digital Health

The researcher studied two issues: 1) Digital health measurement results before and after using the Personalized Cognitive Counseling model 2) Comparison of digital health before and after using the Personalized Cognitive Counseling model

5.4.1 Comparison of digital health measurement before and after using the Personalized Cognitive Counseling model consist of two groups, control group of 30 people and an experimental group of 30 people, as shown in the Table 5.

Table 5: Comparison of digital health measurement before and after using the Personalized Cognitive Counseling model

Groups	n	Total Score	Pretest		Posttest		t-test	p
			$\bar{x}$	*S.D.*	$\bar{x}$	*S.D.*		
Control Group	30	24	12.63	1.61	16.53	1.48	15.28	.000**
Experimental Group	30	24	15.53	1.48	22.23	1.45	27.86	.000**

***p<.01*

From Table 5, the research findings showed that the results of digital health after learning increased in both groups as follows: 1) Control Group, a group who learns with normal teaching methods After learning, the mean was 16.53, the standard deviation was 1.48, before the study was 12.63, and the standard deviation was 1.61. The difference was statistically significant at the .01 level. 2) The experimental group, the group who studied in the Personalized Cognitive Counseling model after learning had a mean value of 22.23, a standard deviation of 1.45, a mean of 15.53, a standard deviation of 1.48, indicating that knowledge before using and after using the Personalized Cognitive Counseling model was significantly different at the .01 level.

5.4.2 Comparison of digital health before and after using the Personalized Cognitive Counseling model between the control group and the experimental group

Table 6: Comparison of digital health before and after using the Personalized Cognitive Counseling model

Groups	n	$\bar{x}$	*S.D.*	t	sig
Control Group	30	16.53	1.48	15.06	.01
Experimental Group	30	22.23	1.45		

**Statistically significant is at 0.01

The control group had a mean of 16.53, a standard deviation of 1.48, while the experimental group had a mean of 22.23, a standard deviation of 1.45 when testing the difference between the means. It was found that the mean of the experimental group was significantly higher than the control group at the .01 level.

6. Conclusion

Nowadays, Digital Health is important as technology inevitably plays a role in our daily lives. especially in terms of health. The researcher has developed the Personalized Cognitive Counseling model enhance knowledge about Digital Health to be used in educating people about Digital Health. The learning style has been assessed and certified by experts as being at the optimal level. Including the results of the Digital Health assessment, showing a significant improvement in digital health. Because of the assessment results after learning management of the students using the higher form before learning. It is therefore a process that can be used to improve the digital Health of today's learners.

7. Discussion

The researchers synthesized literature with regard to the Personalized Cognitive Counseling Process to Promote Digital Health, and found that the synthesis concludes that Personalized Cognitive Counseling Process to Promote Digital Health consists of five processes: 1) Understanding 2) Design 3) Development 4) Choosing and Using Tools, and 5) Evaluation. From in-depth interviews with 21 experts in three different areas, the evaluation of the suitabilityof the process revealed that each step is performed using the telehealth technology. In terms of the

process of understanding it was found that it is consistent with the recommendations of those (Tang et al., 2020) who discussed individual learning approaches in that each learner is different and has his or her own experiences, knowledge, and perceptions. This has a great influence on how to interpret and use new information to create a personalized learning experience based on the individual's personalised knowledge. It encourages students to finding new solutions, derive the best results and develop efficiency. The whole process will encourage learners in terms of digital health. Learning digital health is a challenge in the 21st century. Integrating digital health in personalized cognitive counseling can involve combining digital technology in health, coupled with relying on and developing digital health in daily activities. This is especially important in an era in which technology is rapidly evolving.

From Digital Health Results of Learners that uses the Personalized Cognitive Counseling model. Based on the findings of research in the field of digital health. Learners who learn with the Personalized Cognitive Counseling model compared to traditional learning management can be summarized as follows. the Personalized Cognitive Counseling model can improve digital health literacy for learners. Learners who study with the normal pattern Compared with the learners who studied using the Personalized Cognitive Counseling model found that There was a statistically significant difference in digital health literacy at .05 level. Learners who study with normal learning management methods. From the results of using the Personalized Cognitive Counseling model, it can be concluded that the Personalized Cognitive Counseling model can improve digital health. Different learning styles affected the digital health of the control group and the experimental group. clearly the group of learners who studied the Personalized Cognitive Counseling model had higher digital health than those who studied the normal learning model.

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