

NEED ANALYSIS TO DESIGN TEACHERS' MODULE INCORPORATED WAYS OF THINKING AND ICT- COMPETENCES

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Abstract: Globalization and the advancement of technology influence education fields. In current situations, most teachers find difficulties in integrating 21st-century skills; ICT-Competences, and ways of thinking into teaching and learning activities. In other words, teachers and students need to comprehend and prepare themselves with the comprehension ways of thinking and tools for working. Although technology is advancing quickly, some teachers are not prepared for the new reality. Furthermore, the current circumstances of the information era necessitate the use of thinking skills. Qualitative research was conducted in this study. Descriptive analysis was employed as the methodology of this research to determine and analyze the needs analysis to design the teachers' module incorporated by ways of thinking and ICT competencies in English teaching and learning activity. Need analysis was conducted to identify the procedure and the needs in designing the teachers' module. The data was analyzed using a systematic content descriptive text based on ACTS21S framework descriptors, UNESCO ICT-Competences, and the Hutchinson and Waters Need Analysis Process. The result illustrated that there are forty indicators of ways of thinking and ICT competence are formulated and incorporated into the three phases of teaching and learning activity (pre-instructional, instructional, follow-up). There are the target needs and learners' needs that should be formulated to face the 21st-century skills in current education challenges. In short, this study will be helpful for the teacher in preparing students for 21st-century skills.

Keywords: ICT-Competences, Need Analysis, Teachers' Module, Ways of Thinking

INTRODUCTION

In current teaching and learning activities, students need to adapt to the current skills especially 21st-century skills (Soghomonyan & Karapetyan, 2023). Furthermore, technological advancements have an impact on people's lives and also play a role in education including in the teaching and learning activities in the classroom (Shopia & Iskandar, 2019). Besides, the



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ability to appropriately access, assimilate, interpret, and evaluate information is essential for today's society because of the employment of technology so it is needed for everyone to practice thinking skills and ICT competence. In the age of technology, different types of information need to be recognized and their accuracy evaluated (Griffin, Care, & McGaw, 2012).

As stated in Griffin the Assessment and Teaching of Twenty-First Century Skills Project (ATC21S) in January 2009 was introduced at the Learning and Technology World Forum in London, in response to the growing recognition that many nations are transitioning from an industrial to an information-based economy and that education systems need to adapt. The transition from an industrial to an information-based economy is already changing our lives: the tools someone uses for work are nearly unrecognizable from those of fifty years ago, and the methods of working and thinking are evolving (Griffin, McGaw, and Care, 2012).

The movement from industrial to information-based contributes many people to employing technology significantly and explore various information from many resources provided by using the technology (Budiarta, Rahmana, Asrowia, Gunarhadia, Efendia, 2024). This statement demonstrates the need for citizens to practice thinking skills to assess the information presented by technology. Since many people believe that technology can access a vast amount of information, it becomes difficult for people to determine whether the information is accurate or not. Providing the public with the information skills required in an information society presents a new challenge for education. Education systems need to change, placing more of an emphasis on information and technology skills than ones based on production (Eisenberg, 2008). As a teacher, information skills, thinking skills, and ICT-competences should be comprehended fully and practiced so it can prepare the future smart people to accept, evaluate and produce information.

In January 2009, the Learning and Technology World Forum in London hosted the launch of the Assessment and Teaching of Twenty-First Century Skills Project (ATC21S). The original countries of the project were Australia, Finland, Portugal, Singapore, and England. The United States joined the project in 2010. The project was sponsored by three of the largest technology companies in the world: Cisco, Intel, and Microsoft. From that projects stated that some skills should be practiced by society in 21st century skills including the ways of thinking and ICT-Competences (Griffin, Care, & McGaw, 2012). The development of technology and ways of thinking, which are 21st-century skills, are beneficial to education for information access and interpretation as well as daily living. Knowledge and information are the foundation of education. To put it another way, information must be gathered, processed, and communicated for teaching and learning to take place. Based on the study by Yamith Jose, stated that ways of thinking cover critical thinking, problem-solving, and decision-making (Jose, 2013: 195). Then, UNESCO stated that there are three levels of ICT competencies Acquiring Knowledge, Knowledge Deepening, and Knowledge Creation

(UNESCO, 2018). In brief, the educational system, including teachers and students, should prepare and integrate those ways of thinking and ICT competencies into the teaching and learning process.

However, most Indonesian teachers lack the necessary skills to effectively integrate ICT into their lessons (Shopia & Iskandar, 2019; Shopia et al., 2022; Fadhilah & Sulistyaningrum, 2019; Bandan & Dewanti, 2019; Purnawati & Iskandar, 2019). Besides, Furthermore, it has been found in Sulistyaningrum (2021) and reported in PISA that Indonesian children have comparatively low thinking abilities. This is because Indonesian students are ill-prepared to respond to contextual concerns that call for creativity, critical thinking, and reasoning to be resolved. Additionally, Indonesian students continue to perform poorly in question analysis and response when practicing higher-order thinking Skills (HOTS). According to Rothbarr et al. (2021), thinking skills among Indonesian students are low because 21st-century skills have not been implemented in Indonesian educational institutions and teachers still lack knowledge about how to teach students (Kuntarto et al., 2019) (Sulistyaningrum,2021). For those reasons, the purpose of this research is to analyze the need to design a teacher module that integrates ICT competencies and ways of thinking into teaching and learning activities. With the teachers' module, the teacher can get guidance on how to incorporate ways of thinking and ICT competencies in the teaching and learning process.

In the teaching and learning process, teachers play a significant role. Teachers are widely acknowledged as the foundation of any educational system because students learn from their teachers (Rindu, Ignatius & Aryanti, 2017). In integrating ways of thinking and ICT-competence into teaching and learning activities in the classroom, teachers are the main actors that should comprehend ways of thinking and ICT-competences and they have to know the procedure of how to integrate it into teaching and learning activities. Based on (Yamith, 2013) Ways of thinking are thinking skills that consist of critical thinking skills, problem-solving skills, and decision-making. However, as stated by (UNESCO: ICT Competency Framework for Teachers, 2018) consists of knowledge acquisition, knowledge deepening, and knowledge creation. Teaching professionals in the modern era ought to understand both ICT competencies and ways of thinking. From this explanation, it can be inferred that designing teachers' modules for integrating ways of thinking skills and ICT competence is essential for today's educational system.

The beginning process of creating teachers' modules incorporated ways of thinking and ICT competencies needs analysis. It is imperative that needs analysis be done as the first step in a course before choosing learning objectives, establishing the assessment, designing the course, and producing materials (Sari, Wienanda, & Nugraheni, 2020). As the foundation and starting point for determining the needs of students, NA is crucial for curriculum design, text selection, task design, and material

development. In other words, in designing the teachers' module, a need analysis process takes place.

From the situation elaborated above stated that Indonesian children have relatively low thinking skills and are ill-prepared to respond to contextual concerns that require creativity, critical thinking, and reasoning to be resolved. Additionally, the majority of Indonesian teachers are lack the necessary skills to effectively integrate ICT into their lessons, making it difficult for teachers to prepare their students for the demands and challenges of the modern world. So that, need analysis procedures are formulated to design the teachers' module. The powerful technique of needs analysis (NA) aids in the clarification and validation of actual needs. It gives teachers and other professionals the ability to influence the creation of curricula that center language course content related to the needs, desires, and interests of students. Thus, this research is conducted to answer the research questions as follows (1). What components are needed in preparing guidelines for integrating Ways of Thinking and ICT-competencies in English learning activities?, (2). What is the procedure for integrating ways of thinking and tools for working in English learning activities? In short, this need analysis procedure stated in this research can give guidance and the beginning process of designing the prototype guideline for integrating ways of thinking and ICT competencies in English learning activities.

METHODS

This study used descriptive qualitative research. Particularly in qualitative research paradigms, descriptive analysis is frequently regarded as a research methodology. It entails the methodical gathering, evaluating, and interpreting of data in order to offer a comprehensive and precise description of a phenomenon (Denzin & Lincoln, 2005; Maxwell, 2013).

By using descriptive analysis in qualitative research, researchers can convey and capture the richness of social phenomena and human experiences through descriptive analysis. Using this approach, data is thoroughly explored and described in order to determine the what, how, and why of a given subject. In this study, the phenomenon of the advancement technology in daily life and the information era which is growth will be explored in depth. It is caused that some Indonesian people do not ready for the current change so that this descriptive analysis will be used to describe the need analysis in designing teachers' modules incorporated by ways of thinking and tools for working (Sugiyono, 2005).

In collecting the data, library research, interviews, and observation were employed as the instruments of the research. Library research was used to formulate the framework and theory about ways of thinking and ICT competencies as well as the need analysis process about the procedure in designing the module. ICT-Competences framework is adapted from the UNESCO ICT-Competency framework which organized into three levels

such as knowledge acquisition, knowledge deepening and knowledge creation. The framework of Ways of Thinking is adapted from the Assessment and Teaching of Twenty-First Century Skills Project (ATC21S) by Griffin. Furthermore, the theory of need analysis in designing a module is the Hutchinson and Waters Need Analysis Process

The teacher is the main object of the research so in conducting this research ten selected teachers are observed and interviewed. These are the Tangerang Municipality teachers who do not wish to have their identities made public. In

In collecting the data, there are some steps which are conducted such as; First, conducting library research to make the framework of ways of thinking skills and ICT-Competences, to analyze the component and procedure of need analysis, and to investigate the phase of teaching and learning activity. Secondly, during the observation stage, which is partially involved in the learning process, examine the phase of teaching and learning activity and note how well students can comprehend the material and how the students engage or participate in the learning activity. Thirdly, select students at random who are thought to be representative and capable of answering research questions to know how students understand and comprehend, particularly about ways of thinking skills and ICT competencies. Fourth, gathering information about the need analysis procedure after formulating the framework result of library research and analyzing the data as the result of observation. Furthermore, articles and theses about the requirements for further discussion are needed and the data was analyzed using a systematic content descriptive text based on ACTS21S framework descriptors, UNESCO ICT-Competences, and the Hutchinson and Waters Need Analysis Process.

RESULTS

The results of the study are described from the process of library research, observation and interview. In answering the first research questions such as what components are needed in preparing guidelines for integrating Ways of Thinking and ICT- competencies in English learning activities, library research, and observation were used to get the data.

An international project called the Assessment and Teaching of Twenty-First Century Skills (ATC21S) project aims to identify and develop the skills necessary for success in the twenty-first century. These skills are divided into three primary categories by the ATC21S framework: Tools for Working, Ways of Thinking, and Ways of Working. Every category includes a variety of skills that are necessary for both the workforce and modern education.

In facing the current information era, ways of thinking refers to cognitive processes and strategies that enable individuals to analyze, synthesize and evaluate information to solve problems and generate new ideas. Ways of

thinking skills are essential for the current needs and challenges in technology era for accepting, managing and evaluating the information. The result illustrated that in practicing ways of thinking, students are needed to practice critical thinking skills, problem-solving skills, and decision making skills. "Ways of thinking" describes the various techniques or patterns people employ to absorb information, work through issues, come to conclusions, and comprehend the world. Numerous factors, such as cultural background, education, experiences, and personal disposition, have an impact on these cognitive processes. In the term of ways of thinking, ATC21S stated that Thinking styles include the different ways that people use their minds to make sense of and engage with the world. Besides that, ICT-Competences framework by UNESCO ICT-Competences are formulated to identify what are the components of ICT Competence that should be comprehended and practiced by people. The following figure illustrated the framework;

Figure 1 Framework of Ways of Thinking and ICT-Competences

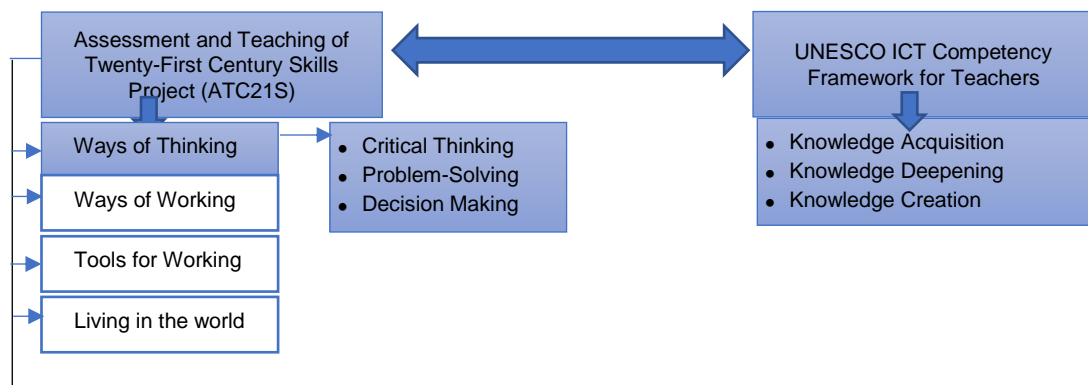


Figure 1 illustrates the framework of ways of thinking and ICT competencies. The ICT-Competences framework's three levels outline a progressive approach to integrating ICT into education, moving from basic skills to advanced, creative, and collaborative uses: (1). Knowledge acquisition build basic ICT literacy and skills, (2). Knowledge Deepening, use ICT to enhance understanding and problem-solving in specific subjects, (3). Knowledge creation, employ ICT for innovative knowledge production and lifelong learning. This framework helps teacher to structure their ICT integration efforts to progressively develop students' digital competencies, preparing them for the demands of the modern technology-driven world. From the result of library research this framework is employed for formulating the component that should be integrated into the teachers' module.

From Figure 1, forty indicators of ICT competencies and Ways of thinking skills are formulated from the theory in which ICT competencies cover Knowledge Acquisition, Knowledge Deepening, and Knowledge Creation. Meanwhile, Ways of thinking skills cover critical thinking skills, problem-

solving skills, and decision-making. Table 1 below is the result of the indicator of ICT-Competences and Ways of Thinking Skills.

Table 1 Indicators Ways of Thinking and ICT-Competences

Critical Thinking	1	Looks for new information to expand understanding while completing the task; ask questions; search for causes, justifications and significance.	(Critical Thinking Indicators- CTis, 2016)
	2	Analyzes thoughtfully the meaning of the information and interpersonal interactions, solicits feedback, adjusts one's own thinking, aware of possible mistakes made by oneself or others and looks for ways to do the task correctly in the future.	(Critical Thinking Indicators- CTis, 2016)
	3	Demonstrate a through comprehension of the materials or discussion (such as reading task, concept of pedagogical skill, understanding the discourse, etc) when completing the assignment.	(Critical Thinking Indicators- CTis, 2016)
	4	Determine, examine, and assess claims of truth and arguments.	(Gregory, William, Henry, Wallace, 2010)
	5	Determine causes, assess causes, and provide causes	(Gregory, William, Henry, Wallace, 2010)
	6	Understand the concept or the other person's argument clearly, then assess or assert the argument	(Gregory, William, Henry, Wallace, 2010)
	7	Recognize the debates and topics covered in the college courses and textbooks.	(Gregory, William, Henry, Wallace, 2010)
	8	Create your own arguments regarding the specific subjects or problems.	(Gregory, William, Henry, Wallace, 2010)
	9	Make conclusions and present the arguments	(Alec Fisher, 2001)
	10	Formulate logical conclusion (if this is the case, then that follows because....); follows intuition as a guide; acts on intuition only after being aware of the associated risks.	(Critical Thinking Indicators- CTis, 2016)
Problem Solving	11	Recognize the issue; create a plan or approach; carry out the strategy and evaluate the results	(Machdel, Marita, 2019)
	12	Recognize the nature of the issues initially	(Machdel, Marita, 2019)
	13	Recognize the characteristics and the definition of problems.	(Machdel, Marita, 2019)
	14	Encourage students to try new things by coming up with answers and fixing issues.	(Lismayani, Parno, Mahanal, 2017)
	15	Investigate a topic in-depth and apply your understanding to challenging, real-world queries, concerns, and issues	(UNESCO,2011)
	16	Determine the relationship between his or her prior experience (schema) and the issues at hand and take action to address it	(Foshay, Rob & Kirkley, Jamie, 2003)55
	17	Investigate seeks to identify fresh approaches to a problem's solution.	(Lismayani, Parno, Mahanal, 2017)
	18	Determine and talk about the ways in which students acquire and use sophisticated cognitive skills	(UNESCO,2011)
	19	Talk about the traits of the sophisticated cognitive process and how students learn and exhibit them	(UNESCO,2011)
	20	Expand on the conversation about their own cognitive abilities to externalize and explicitly show how they apply these abilities to solve issues in their field of study	(UNESCO,2011)
Decision Making	21	Gather data and create feasible alternative options	(Budi Astuti, Rizqi Lestari, Caraka Putera, 2019)
	22	Establish logical objectives, clearly define issues, evaluate and comprehend inquiries, show responsiveness, and use creativity when solving problems.	(Budi Astuti, Rizqi Lestari, Caraka Putera, 2019)
	23	Analyze the benefits and risks of a choice, consider how decisions will be implemented and base your choice on a number of viable options	(Budi Astuti, Rizqi Lestari, Caraka Putera, 2019)
	24	Plan the execution of decisions and make a commitment to the decisions made	(Budi Astuti, Rizqi Lestari, Caraka Putera, 2019)

	25	Analyze the outcomes of the decisions made, assess the impact of putting the resolution into action and be prepared to make decisions going forward.	(Budi Astuti, Rizqi Lestari, Caraka Putera, 2019)
	26	Examine the circumstances. As soon as you realize that "what is" and "what could be" differ from one another, closely examine the circumstances to ascertain the precise reason behind the difference	(Doris "Katey" Walker, 1987)
	27	Think about the aim or goals you wish to accomplish. Your values- what you think is significant- have an impact on the objectives you select	(Doris "Katey" Walker, 1987)
	28	Instead of focusing only on the obvious or routine solutions, consider all available options when trying to solve your issue. Thinking outside the box, reading and interacting with others could reveal more opportunities	(Doris "Katey" Walker, 1987)
	29	Think about the repercussions. Considering the future and asking yourself "what might happen if I do this" is one of the most important aspects of decision-making.	(Doris "Katey" Walker, 1987)
	30	Determine which of several alternative option is the best.	(Paul Brest, Linda Hamilton, 2010)
ICT Competence	31	Understand how a browser functions and where to look for necessary resources.	(UNESCO, 2011)
	32	Utilize the search engines on your computes to aid in your lesson plans and students learning	(UNESCO, 2011)
	33	Choose the relevant internet and the World Wide Web to utilize in teaching and learning process.	(UNESCO, 2011)
	34	To view a website, use the relevant URL	(UNESCO, 2011)
	35	Look online for possible instructional resources that may be required.	(UNESCO, 2011)
	36	Utilize digital resources and presentation software when conducting lessons in the classroom.	(UNESCO, 2011)
	37	Facilitate the students' acquisition of academic subject matter knowledge, include relevant ICT activities in lesson plans.	(UNESCO, 2011)
	38	Create study plans and instructional activities that incorporate a variety of ICT tools and devices to help students develop their critical thinking, planning, reflective learning, knowledge construction and communication skills.	(UNESCO, 2011)
	39	Provide online resources and exercises that encourage group problem-solving, research and artistic expression among students.	(UNESCO, 2011)
	40	Use the digital resources and presentation software during the class activity	(UNESCO, 2011)

Other components are formulated in answering this research besides the framework of ways of thinking and ICT competencies. The sets of teaching and learning were observed by five teachers who conducted teaching and learning activities in the classroom. The result illustrated that three aspects should be considered by the teacher if they incorporate ways of thinking and ICT competencies such as pre-instructional, instructional, and follow-up. In the process of need analysis, two need types should be identified such as target needs and learner needs. Besides, to identify the need types, teachers in EFL classes should get information about learners' necessities, lacks, and wants Figure 2 illustrates the procedure of need analysis in designing the prototype of teachers' module incorporating Ways of thinking and ICT-Competences.

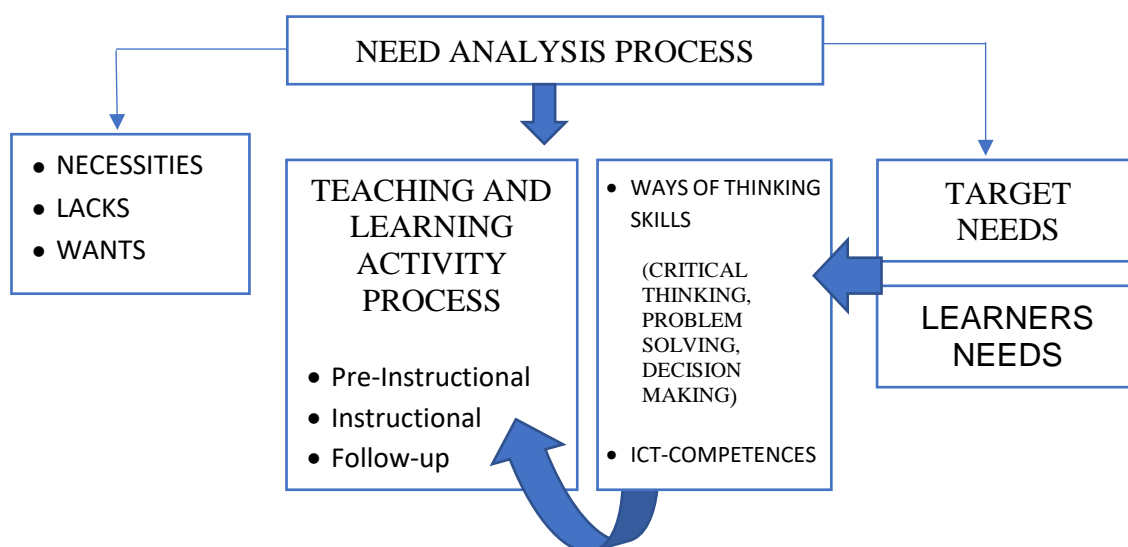


Figure 2 The Procedure of Need Analysis

DISCUSSION

The result of this research confirmed by (Shopia & Iskandar, 2019; Shopia et al., 2022; Fadhilah Hamid & Sulistyaningrum, 2019; Bandan & Dewanti, 2019; Purnawati & Iskandar, 2019) that ICT-competences can be incorporated into the curriculum. The results of those previous studies confirmed that integrating ICT competencies into the curriculum can be conducted by formulating the indicators of ICT competencies. From this result, an indicator of ICT competencies is formulated to be integrated into the teaching and learning process so that the teacher can get guidance on how to integrate ICT-Competence.

Both ICT-Competences and Thinking skills which cover critical thinking, problem-solving skills, and decision making can be incorporated into the teaching and learning activity by formulating the indicators. After formulating the indicators of ways of thinking skills and ICT competence. The learner's needs in the process of teaching and learning activity should be formulated. It is confirmed by (Sulistiyaningrum, D, S., & Shopia, Khilda., 2024) that in incorporating thinking skills into the syllabuses and the process of teaching and learning activity, indicators of thinking skills should be formulated. However, the previous research conducted by (Sulistiyaningrum, D, S., & Shopia, Khilda., 2024) stated that the cognitive process dimension of higher-order thinking skills (HOTS) should be integrated into the indicators in the process of teaching and learning activity, if critical thinking skills, problem-solving skill, and decision making involve into the curriculum or teaching and learning activity. It is also supported by Sulistyaningrum, Siti Drivoka, & Putri, and Rosevinda Nabila, 2021) that thinking skills can be fostered in the learning activities on lesson plans by formulating indicators in the level of higher-order thinking skills (HOTS) based on Anderson and Krathwohl's Taxonomy's cognitive levels and ACTS21S framework descriptors. The researcher also stated the procedure incorporating thinking skills in lesson plans as follows; analyzing first means breaking down a

material into its constituent parts and figuring out how those parts relate to each other and a bigger structure. This category includes cognitive tasks like organizing, differentiating, and attributing. Second, evaluation is the process of forming conclusions using standards and criteria. The most often used criteria are consistency, quality, efficacy, and efficiency. Under the category of assessment (judgments based on external criteria), the cognitive processes of checking (internal consistency judgments) and criticizing are included. Thirdly, creating entails assembling parts to form a logical or useful whole. Students must mentally arrange some materials or parts into a pattern or structure that was not previously obvious to create a new product for the objectives. Thus, the creative process can be conceptualized as starting with a divergent phase where the learner attempts to understand the task and considers several possible solutions (generating). The learner then proceeds to a convergent phase where they formulate a solution approach and turn it into a plan of action (planning). Lastly, the learner executes the plan after creating the solution (producing).

From the explanation above, it can be inferred that incorporating ways of thinking skills and ICT competence can be investigated by formulating the indicators of both of them. Then, in investigating the need analysis to design the prototype of teachers' module incorporated ways of thinking and ICT-Competences, target needs and learner needs also should be identified. The main focus of target needs is on what the learner must accomplish in the target situation. The target situation for this research is the education challenges in 21st-century skills by practicing thinking skills and ICT-Competences (Assessment and Teaching of Twenty-First Century Skills Project (ATC21S), 2012). Additionally, the researcher should learn about the necessities, lack, and wants of their students in the procedure of need analysis. The requirements of the target situation, whether academic or professional, are known as necessities. These are the things a learner must know to perform well in the target situation. What students already know and what they lack are their shortcomings. Meanwhile, wants refers to the learners' expectations and hopes towards acquiring the knowledge.

CONCLUSION

In conclusion, before designing the teachers' module integrated ways of thinking and ICT competencies, a need analysis procedure was conducted to make the prototype and analyze the components needed as well as the procedure that should be completed. In analyzing the need analysis, the target need and learner needs should be formulated as well as the indicators of ways of thinking and ICT competencies. Indicators are formulated because they can be incorporated into the teaching and learning process in which there are three phases of teaching and learning activity (pre-instructional, instructional, and follow-up). The indicators of ways of thinking (Critical thinking skills, problem-solving skills, and decision making) and ICT-Competences are formulated and integrated into the three phase of teaching and learning process. In short, this research is expected can be

useful for the teacher in incorporating ways of thinking skills and ICT competencies into teaching and learning activity.

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