

Technology pedagogy content knowledge framework to prepare Indonesian career counselors

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ABSTRACT

Technological pedagogical and content knowledge (TPACK) is one of the smart solutions for implementing learning in accordance with the demands of education by integrating technology. The purpose of the study was to analyze the competency level of counselors in Indonesia in terms of age in terms of age, gender, and level of education. The research design used a cross-sectional survey in a non-experimental quantitative study. Respondents in this study amounted to 420 counselors in Indonesia obtained by using a proportional random sampling technique. Data were collected by questionnaire technological pedagogy content knowledge test for counselors (TPACK-TFC). The results of the study found that the TPACK was owned by counselors with an average score of 46.78 in the low category. Judging from the aspect of technology knowledge (TK), a score of 59.88 was obtained in the medium category, content knowledge (CK), pedagogical knowledge (PK), pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK) was at a relatively low level. The results showed that Indonesian counselors have not fully integrated learning models using aspects namely technology, pedagogy, and content, and need to get attention from the government, higher education institutions, and the community for the development of quality guidance and counseling services and counselor careers in the future.

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1. INTRODUCTION

Technology provides opportunities for teachers to leave or create various contexts and learning environments in the teaching and learning process. Educators must equip themselves with technological knowledge and skills and apply technology in producing a more effective teaching and learning process [1]. The importance of applying technology in the teaching and learning process and also in the current education system has become a policy choice in education development because of teaching and learning strategies and approaches [2]. Technological pedagogical contents knowledge (TPACK) is a model that is used as one of the smart solutions to ensure the implementation of learning in accordance with the demands and changes [3]. TPACK is illustrated as a form of multi-integration and transformation [4], [5] TPACK deals with the knowledge required by teachers to integrate technology into the teaching of certain content.

The teacher has an intuitive understanding of the complex interaction between the three basic components of knowledge (content, pedagogy, technology) by teaching content using appropriate pedagogical and technological methods. TPACK is a truly meaningful and highly skilled teaching base with technology [6]–[12]. There are seven components included in the TPACK framework, in this case a counselor consisting of seven components as: i) Technology knowledge (TK) which sees knowledge about various technologies ranging from standard technology, such as books and teaching aids to digital technologies such as the internet, video, interactive whiteboards, and software programs; ii) Content knowledge (CK) is a form of knowledge about material the actual lesson to be taught. CK is very important for teachers. This knowledge includes knowledge of concepts, theories, ideas, frameworks of thought, real knowledge, evidence, laws, principles, practices and approaches to developing knowledge, especially guidance and counseling; iii) Pedagogical knowledge (PK) is in-depth knowledge of the process and practice in delivering the content to be studied or learning methods that include learning objectives, values, and learning processes; iv) Pedagogical content knowledge (PCK) is different from various types of content, because PCK is a combination of content and pedagogy with the aim of develop the practice of teaching a better content in accordance with the characteristics of the material to be taught. PCK includes core material, learning process, curriculum, assessment, and learning outcomes; v) Technological content knowledge (TCK) is a form of knowledge about the existence of technology and the capabilities of various technologies such as those used in the learning process, knowing how to teach and learning arrangements, knowing how to changes in learning outcomes due to using certain technologies and vice versa; vi) Technological pedagogical knowledge (TPK) is a form of knowledge to improve practical pedagogical abilities which include teaching skills, assessment and learning motivation due to the use of technology applications in the learning process. Teachers need preliminary study data to strengthen the need for technology applications in the learning process; and vii) TPACK relates to the knowledge needed by teachers to integrate technology into teaching certain content [8], [13], [14]. The teacher has an intuitive understanding of the complex interaction between the three basic components of knowledge (content, pedagogy, technology) by teaching content using appropriate pedagogical and technological methods.

All the opportunities provided by the use of technology, there are unsolved challenges that on the one hand prevent teachers from inculcating the use of technology and sticking to conventional teaching methods or methods. However, as a significant practical problem, most of the technologies considered in the current literature are newer and digital and have some inherent properties that make their implementation in an easy way difficult. Naturally, newer, unstable and opaque digital technologies present new challenges for teachers who are struggling to use more technology in their teaching to avoid misinformation or fake news [15], [16]. Teaching with technology is more complicated considering the new technological challenges present for teachers. Becoming a teacher in the future is a challenge for them that they must be able to face the Gen-Z learning style which is exposed to various technological devices [2], [17]–[20]. New problems will be found more and more because the conditions experienced by Gen-Z children are not the same as baby boomer children, this is evidenced by the behavior of Gen-Z children who are too confident, impatient, tend to solve problems in an instant way so they tend not to be able to wait for the process to be completed. solve the problem. This is a challenge faced by teachers in the learning process. Teachers need to design learning models by integrating three main aspects, namely technology, pedagogy, and content [21]. Teachers must be more creative in teaching. The use of technology by teachers can be integrated into the learning process in accordance with learning materials and appropriate learning strategies according to student characteristics.

The research conclude that teachers who are in teaching need a TPACK model to build, prepare the environment, and facilitate class in problem solving [22]. Teachers can direct students to real-life problem situations, or teachers can create an environment in which students can practice thinking, analyzing, and solving problems [21]–[23]. This study aims to analyze and describe the extent to which the effectiveness of the integration of learning and the use of technology used in counseling services is seen through TPACK for counselor careers in Indonesia.

This is done because there are still many misconceptions regarding the duties and responsibilities of guidance and counseling (BK) teachers in Indonesia, counseling teachers have not fully equipped themselves with technological knowledge and skills and the application of technology in service delivery. Even though technology can provide opportunities for teachers to leave or create various contexts and learning environments in the teaching and learning process so that the competencies possessed by teachers can be released in accordance with life's needs. By explaining the integration of learning and the use of technology used in counseling services, it also opens opportunities for future counselor career planning by using the TPACK model to explore more broadly the potential possessed by counselors or prospective counselors in Indonesia. this is done so that Indonesian graduate counselors have TPACK skills that can be used to provide optimal services for students. The learning material used can be interesting power point slides so that students understand it more easily and use the help of augmented reality technology and artificial intelligence (AI) [22]–[25].

2. RESEARCH METHOD

This study used a cross-sectional survey. This quantitative research design, survey method is used to help researchers describe and events or phenomena in the form of their existence without intervention that affects the results [26]. This study aims to describe TPACK in counselors and counselor candidates in Indonesia. Sampling in this study using a purposive random sampling technique, as many as 420 respondents consisting of guidance and counseling counselor and counselor candidates (guidance and counseling students) spread across Indonesia. The researchers collected data from August 1st to 13rd, 2022. Most of the participants were bachelors (n=197), masters and doctoral (n=28), uncertified guidance and counseling teachers/counselor (n=75), certified guidance and counseling teachers/counselor (n=120), male (n=70) and female (n=350). Age <25 (n=244) as a student, 25-35 (n=158) as a junior teacher, and age >35 (n=18) as a senior teacher. Data collection is done online through the SurveyMonkey application. In the context of the current COVID-19 pandemic, online surveys can be quickly created and distributed with a wide reach [27]. More specifically, the demographic information of the respondents is shown in Table 1.

Table 1. Demographic profile of respondents TPACK test

Variable		Frequency	Mean	SD
Gender	Female	350	34.460	13.600
	Male	70	38.214	9.409
Age	<25	244	36.757	9.648
	25-35	158	38.939	8.643
	>35	18	39.008	8.982
Grade level	College student	197	30.25	7.853
	Magister/Doctoral students	36	36.357	6.499
	Uncertified teacher	75	38.84	9.287
	Certified counselor	120	40.367	11.534

The instrument used is technological pedagogy content knowledge test for counselor (TPACK-TFC) with 75 items with a score of 1 for correct answers, 0 for incorrect answers. The reliability of the TPACK-TFC item has been validated using Rasch modeling item analysis with item reliability 0.9. This shows that the items used are in the very good category [28]. Data collection of TPACK-TFC was carried out as the main data collection tool using the SurveyMonkey application. At the start of the survey, respondents are informed about the purpose of the investigation, the content of the survey, and instructions for completing it. Keep remembering their identity kept secret. Written consent was obtained prior to data collection, as data collection was on a voluntary basis, their participation would not affect their final exam scores. All respondents were allowed to complete the TPACK-TFC at their own place, choosing at a time set for them through a self-administered survey [29]. Data analysis used Jeffrey's Amazing Statistics Program (JASP) analysis application to obtain descriptive statistical data, t-test, and Pearson correlation. this is done to describe the results of inferential statistical analysis and protection against errors in data interpretation.

3. RESULTS AND DISCUSSION

3.1. Results

In this section, according to the research objectives, the results of the analysis of all components of TPACK regarding descriptive statistics, t-test, and Pearson correlation are presented. The descriptive statistics (i.e., minimum and maximum scores, mean scores, and standard deviations) for the TPACK-TFC score can be seen in Table 2. Based on the table, the TPACK-TFC score found that Indonesian counselors in integrating technology in learning as a whole are still relatively low.

Table 2. Score TPACK-TFC in Indonesia

TPACK-TFC score	Valid	Missing	Mean	Std. Dev.	Min	Max
College student	197	0	30.26	7.853	6.00	49.00
Magister/Doctoral students	28	0	36.36	6.499	25.00	49.00
Uncertified teacher	75	0	38.84	9.287	11.00	64.00
Certified counselor	120	0	40.37	11.53	15.00	70.00

It can be seen from the average score of counseling guidance undergraduate students who are in field practice (n=197) of 30.26, then Magister/Doctoral students (n=36.36) with an average score of 36.36, then uncertified teachers (n=75) with an average of 38.84, and certified teachers (n=120) with a mean the average

score of 40.37. These results obtained an understanding that the effectiveness of technology integration in learning through TPACK is still relatively low for counselors or counselor candidates in Indonesia. Furthermore, the results of statistical processing were found, in general the average TPACK score of Indonesian counselors based on the seven components of TPACK can be seen in Figure 1.

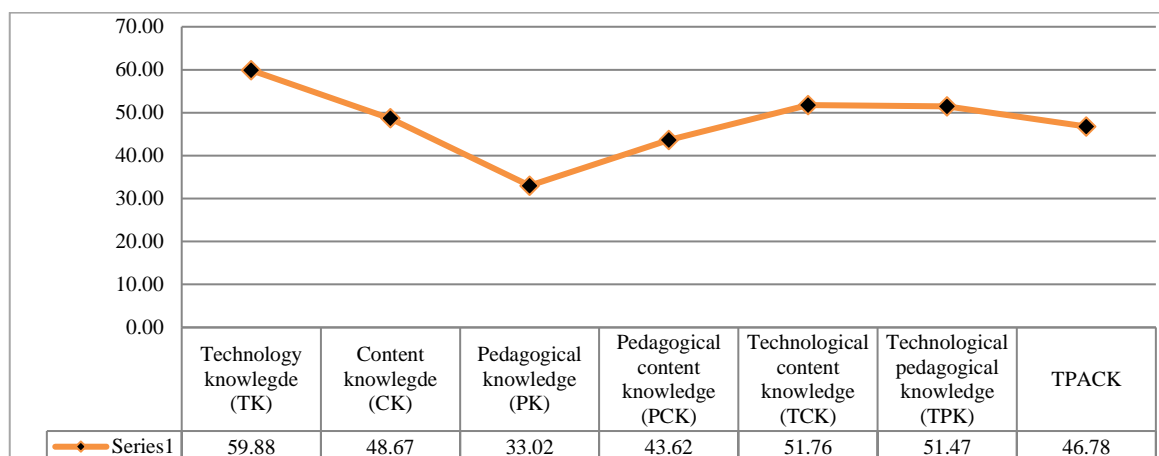


Figure 1. TPACK average score of Indonesian counselors

Based on Figure 1 in this study, it can be seen that the average TPACK score for Indonesian Counselors is weak on PK with a score of 33.01, this indicates the teacher's knowledge of related practices, processes, and methods teaching and learning is still weak. As a general form of knowledge, PK encompasses educational aims, values, and goals, and may apply to more specific areas including understanding student learning styles, classroom management skills, lesson planning, and assessment. This general form of knowledge applies to understanding how students learn, general classroom management skills, lesson planning, and student assessment [16], [30], [31], this includes knowledge of the techniques or methods used in the classroom; the nature of the target audience; and strategies for evaluating student understanding.

Thus, PK requires an understanding of cognitive, social, and developmental learning theories and how they are applied to students in the classroom. This can also be seen from Table 3. The average pedagogical knowledge score of Indonesian counselors based on demographic data.

Table 3. Scores of PK of counselors in Indonesia

	Pedagogical knowledge score			
	College student	Magister/Doctoral students	Uncertified Teacher/Counselor	Certified Counselor
Valid	197	28	75	120
Missing	0	0	0	0
Mean	3.310	3.964	4.333	4.800
Std. Deviation	1.597	1.621	1.818	2.240
Minimum	0.000	1.000	1.000	1.000
Maximum	8.000	7.000	9.000	11.00

Based on Table 3, pedagogical knowledge scores possessed by prospective counselors and counselors in Indonesia, it can be seen that certified teachers have higher scores than uncertified teachers/counselor, magister/doctoral students and college students. This also proves that the pedagogical abilities of certified teachers are higher than those of uncertified teachers, master/doctoral students and undergraduate students. However, this is also a concern because the overall level of pedagogical knowledge possessed by Indonesian counselors is relatively low, only 33.01 out of 100. The pedagogical knowledge possessed by Indonesian counselors should be better because the quality of education is recognized as an important and critical aspect in development [32]–[34], To achieve quality education, there must be effective teachers to ensure that the potential development of young people develops [35], [36]. This is also a concern of educational institutions whose task is to prepare prospective teachers who are equipped with in-depth knowledge and pedagogical competencies and are imbued with ideals, aspirations and traditions of life and culture. If this is not done, perhaps in the next 10 years the teacher will no longer be able to identify the problems of how students learn,

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understand student learning styles, have classroom management skills, lesson planning, and teacher assessments. Furthermore, to identify whether all TPACK domains (TK, CK, PK, PCK, TPK, TPCK) differ by gender. Table 4 presents the results of the analysis.

Table 4. Independent t-test

V	Group	Mean	SD	SE	t	df	p
TK	Male	5.21	2.021	0.168	2.13	418	0.034
	Female	4.70	1.782	0.095			
CK	Male	15.28	5.483	0.454	2.52	418	0.012
	Female	13.88	3.971	0.147			
PK	Male	4.71	2.427	0.201	3.58	418	<.001
	Female	3.81	1.805	0.097			
PCK	Male	6.91	3.161	0.262	1.30	418	0.13
	Female	6.46	2.491	0.092			
TCK	Male	2.61	1.254	0.104	0.14	418	0.58
	Female	2.58	1.157	0.062			
TPK	Male	3.47	1.595	0.132	2.30	418	0.02
	Female	3.01	1.508	0.081			

As visualized in Table 4, male counselors scored slightly higher than women in all domains of the TPACK framework; TK, PK, CK, PCK, TCK, and TPK. Based on the test results, there were no differences between men and women in terms of PCK scores ($t=1.303$; $p=0.134$) and TCK scores ($t=0.142$; $p=0.581$). Furthermore, the largest and smallest differences in mean scores by gender were found in TK ($t=2.130$; $p=0.034$), CK ($t=2.522$; $p=0.012$), PK ($t=3.588$; $p<.001$), and TPK ($t=2.307$; $p=0.022$) respectively. Overall, none of the other domains (i.e., TPACK; TK, PK, CK, PCK, TCK, and TPK) showed a significant difference in terms of gender. Based on the results of this study, it was found that the knowledge of teachers to teach their students in terms of guidance and counseling can be assumed that men are more able to provide services effectively, especially in the use of technology. TPACK is a theory developed to explain the set of knowledge that teachers need to teach their students, to teach effectively, and to use technology [2], [5], [31], [37]. To examine the relationship between variables, the researchers also tested whether grade level was related to TPACK. The results of the correlational analysis are shown in Table 5.

Table 5. Pearson's correlations

Variable		TK	CK	PK	PCK	TPK	TCK
TK	Pearson's r	—					
	p-value	—					
CK	Pearson's r	0.379	—				
	p-value	<.001	—				
PK	Pearson's r	0.287	0.428	—			
	p-value	<.001	<.001	—			
PCK	Pearson's r	0.268	0.406	0.354	—		
	p-value	<.001	<.001	<.001	—		
TPK	Pearson's r	0.259	0.358	0.336	0.325	—	
	p-value	<.001	<.001	<.001	<.001	—	
TCK	Pearson's r	0.184	0.297	0.243	0.286	0.216	—
	p-value	<.001	<.001	<.001	<.001	<.001	—
TPACK	Pearson's r	0.688	0.904	0.761	0.779	0.676	0.557
	p-value	<.001	<.001	<.001	<.001	<.001	<.001

The correlations between the six TPACK factors are all very positive. The results also showed that there was a significant correlation between all TPACK perception domains ($p<0.05$). It is assumed that the six TPACK factors in learning have a significant relationship so that they cannot be separated from one another. This is because the resulting six factors are highly correlated with TPACK with TK ($r=0.688$; $p=0.001$), it is assumed that the implementation of TPACK is associated with TK has a strong relationship because knowledge of various technologies ranging from standard technology, such as books and teaching aids to digital technology such as the internet, videos, interactive whiteboards, and software programs can help students in their learning.

TPACK with CK ($r=0.904$; $p=0.001$) it is proven that TPACK is associated with CK. CK is a form of knowledge about the actual subject matter that will be taught. CK is very important for teachers. These results also prove that counselors in Indonesia already have very good skills related to knowledge of concepts, theories,

ideas, frameworks of thought, real knowledge, evidence, law, principles, practices and approaches to knowledge development, especially guidance and counseling. Furthermore, it can be seen from the TPACK with PK ($r=0.761$; $p=0.001$). This result also proves that knowledge about processes and practices in delivering the content to be studied or learning methods that include learning objectives, values, and the learning process carried out by counselors is quite good. Further to see TPACK with PCK ($r=0.761$; $p=0.001$). These results also prove that the PCK possessed by counselors is good because in the learning process they can combine various types of content and pedagogy with the aim of developing teaching practices for a better content in accordance with the characteristics of the material to be taught including the core material, the learning process, curriculum, assessment, and learning outcomes, then viewed TPACK with TPK ($r=0.676$; $p=0.001$).

These results found that the counselor's knowledge related to TPACK in the form of knowledge to improve practical pedagogical abilities which include teaching skills, assessment and learning motivation because the use of technology applications in the learning process is still quite relevant. Technology in the learning process. Then TPACK with TCK ($r=0.557$; $p=0.001$), these results find that counselors have not combined the existence of technology and the ability of various technologies as used in the learning process, know how to teach and study arrangements, know how learning outcomes change due to using certain technologies. even though today's technology can make it easier for counselors to provide services to be provided.

3.2. Discussion

The purpose of this research is to obtain information regarding the analysis and description regarding the extent to which the effectiveness of the integration of learning and the use of technology used in counseling services is seen through TPACK for counselor careers in Indonesia. The results of this study indicate that low teaching experience had a positive effect on the teachers' low TPACK. This also proves that certified guidance and counseling teachers can improve TPACK competencies more than others, this also strengthens that teacher certification activities also increase the potential of teachers, especially guidance and counseling teachers/counselor. Viewed from various countries such as Pakistan, Philippines, China found that there is a strong relationship between technology proficiency and teacher's ability to present learning [38]–[41]. This also strengthens that guidance and counseling services; counselors need to integrate technology in the implementation of learning. The transformation that has taken place in Indonesia shows the community's need for someone who has the ability to set goals and achieve them independently [7], [12], [31], [42]. In this regard, education is faced with the task of forming the personality of prospective teachers or educators who are able to diagnose the process and results of learning activities. However, the educational technology used today still often alienates prospective educators from educational activities [42]–[44].

Previous literature studies have recognized the importance of implementing the learning process, so that teaching effectively and using technology can be integrated. The survey results also showed that students tend to appreciate, want the use of technology in classroom learning [31], [45]–[49]. This is because it can make it easier to understand the learning material. However, the results of this study prove that not all educators can effectively deliver lessons with the integration of technology. There needs to be a special and ongoing program for prospective counselors in higher education to increase the effectiveness of technology integration in learning so that prospective counselors and counselors can later integrate learning using TPACK. This is necessary because the rapidly changing technological developments make today's learning only the history of tomorrow. If teachers only focus on conventional learning, they will be left behind. Learning by integrating technology must always be updated [31].

Several studies that have been carried out by previous experts can provide teachers with five stages of TPACK development. The first is to recognize or knowledge. This stage is where a teacher is able to use technology [2]. The second stage is accepting or persuasive. At this stage the teacher chooses certain parts of the teaching and learning process to be integrated with technology, while some are maintained with traditional approaches or other approaches that are considered more effective without the help of technological devices. The third stage is adaptation or decision making where teachers start to engage in classroom activities with topics they choose and think will be more meaningful with the integration of technology while the rest stay with other appropriate approaches. The fourth stage is exploration or implementation. At this stage, the teacher is considered more advanced in the application of technology because at this stage the teacher actively integrates appropriate technology in the teaching and learning process. The last stage is confirmation or decision. It is when the teachers look back at their teaching and learning process what they have done with the integration of technology tools and evaluate the results of the decisions [46], [50], [51].

Ideally a teacher with deep pedagogical knowledge understands how students build knowledge and acquire skills and how they develop habitual thoughts and positive dispositions towards learning. The results of this study indicate the problem of PCK, where the average score possessed by counselors in Indonesia is 43.61 from level 100. PCK is teacher knowledge about the basic areas of teaching and learning, including

curriculum development, student assessment, and reporting results. PCK focuses on promoting learning and exploring the relationship between pedagogy and its supporting practices such as curriculum and assessment [52]–[54]. Ideally a teacher with deep pedagogical knowledge understands how students build knowledge and acquire skills and how they develop habitual thoughts and positive dispositions towards learning. The results of this study indicate the problem of PCK, where the average score possessed by counselors in Indonesia is 43.61 from level 100. PCK is teacher knowledge about the basic areas of teaching and learning, including curriculum development, student assessment, and reporting results. PCK focuses on promoting learning and exploring the relationship between pedagogy and its supporting practices such as curriculum and assessment [16]. When faced with this problem, educational institutions need to review again regarding PCK more deeply through the current curriculum, must focus more on PCK such as management skills in counseling need to be done with more in-depth field practice, micro teaching, field studies, diagnosis of student learning difficulties. This can be given input to improve the existing PCK of prospective counselors in the future. This needs to be done to reduce the impact on future counselors in overcoming problems that occur in students later.

The next problem lies in CK which has an average score of 48.66 at level 100. CK describes the teacher's own knowledge about the service material provided. CK can include knowledge of concepts, theories, evidence, and organizational frameworks in certain subject matter; it can also include best practices in the field and established approaches to communicating this information to students [55]–[57]. In general, counselors in Indonesia do not all understand about the CK that is in them, CK should be the thing that is most favored by all existing educators. This is done to ensure that the implementation of this activity will not be separated from the CK that has been taught so far. Moreover, this CK problem is the core of learning activities, where CK will also differ according to discipline and grade level. CK is the teacher's knowledge of the subject matter to be studied or taught. The content that will be discussed with one client is different from the content that will be discussed in the same issue or with different clients. Knowledge of content is very important for teachers or counselors to provide appropriate services in alleviating problems that occur. This knowledge will include knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence and evidence, and appropriate practices and approaches for the services provided. CK is very different between fields of inquiry, and teachers must understand the foundations of deeper knowledge of the disciplines in which they teach.

The next problem for counselors lies in TPK which is at an average score of 51.46 from level 100. TPK This explains the teacher's understanding of how certain technologies can change the teaching and learning experience by introducing skills and new pedagogical constraints. TPK is the understanding of how teaching and learning can change when certain technologies are used in certain ways [31], [37], [49], [58]. Based on these findings, prospective counselors are sufficient to use technology in learning, because it can be assumed that counselors in the Technological pedagogical knowledge aspect discuss understanding how the tools or technology used can be integrated with pedagogy in a way that is appropriate to the discipline and development of existing lessons. This can be in line if the PK owned by the teacher can be implemented properly through the teacher's knowledge of practices, processes, and methods related to teaching and learning. To build TPK, a deeper understanding of the constraints and affordability of technologies and the disciplinary context in which they function is required. For example, TPK becomes very important because most popular software programs are not designed for educational purposes. Software programs such as Word, PowerPoint, Excel, Learning Management Systems, web-based technologies such as blogs or podcasts designed for entertainment, communication, and social networking purposes [2], [16], [31], [49], [58]. Teachers need to develop skills to look beyond the most common uses for technology, reconfiguring it for tailored pedagogical purposes. Thus, Technological pedagogical knowledge requires seeking forward-looking, creative, and open-minded use of technology, not for its own sake but to advance student learning and understanding. Today's use of technology is related to understanding the affordability of technologies and how they can be utilized differently according to with changing contexts and goals.

The next level of the condition of counselor TPACK in Indonesia lies in TCK with an average score of 51.76 at level 100. TCK is this explains the teacher's understanding of how technology and content can influence and encourage each other. other. Understanding the impact of technology on the practice and knowledge of a particular discipline is critical to developing appropriate technological tools for educational purposes. Technology options provide content ideas that can be taught. Likewise, certain content decisions may limit the types of technology that can be used. Technology can limit the types of representations that are possible, but it is also capable of constructing newer and more varied representations. In addition, technological tools can provide a greater degree of flexibility in navigating these entire representations. So TCK involves understanding how subject matter can be communicated through different technology offerings, and considering which specific technology tools are best suited for a particular subject matter or classroom. The form of knowledge about the existence of technology and the capabilities of various technologies such as those used in the learning process, knowing how to teach and learning arrangements, knowing how learning outcomes change due to using certain technologies and vice versa.

The results of the next score on the TPACK score on the TK component obtained a score of 59.88 at level 100. On average it can be said that current counselors already have knowledge regarding technology, but have not been able to integrate their abilities with existing technology. there is. TK describes teachers' knowledge of, and ability to use, various technologies, technology tools, and related resources. TK concerns understanding technology in a particular subject area or class, learning to recognize when technology will help or hinder learning, and continually learn and adapt to new technology offerings. TK is no longer a serious problem for the millennial community, this is because the millennial community is already using sophisticated technology at this time so that problems related to TK are not so meaningful for the millennial community, but the core problem in This research focuses more on PK, PCK, and CK. The results of this study indicate that there is a need for career planning for counselors and prospective counselors based on TPACK competencies. The curriculum in higher education institutions in the future will not only focus on the scientific content of counseling guidance, but will prioritize a combination of scientific content, PK and technology which will be integrated into the TPACK competencies.

4. CONCLUSION

In summary, TPACK is one of the smart solutions to ensure the implementation of learning is in accordance with demands and changes to integrate technology into education. In addition, a curriculum that contains TPACK competencies is important for higher education to prepare career planning for counselors and prospective counselors in the future. The results of this study indicate that school counselors have not fully implemented technology integration in service delivery through TPACK. There is a significant difference in TPACK in terms of gender where men are more likely to apply TPACK than women. These findings are of particular concern to educational institutions, especially tertiary institutions, in increasing PK, PCK and CK, particularly in the areas of guidance and counseling. The limitation of this study is using a sample that still measures the condition of the guidance and counseling teacher profession and has not yet measured the professional competence of educators as a whole. Future researchers can conduct research by looking at the professional conditions of teachers in more depth and Educational Institutions for Education Personnel (LPTK) can provide understanding, knowledge, and practices that are appropriate to current conditions, for example teaching pedagogic content to teachers or aspiring counselors, providing practical training. Learning activities using smart technology that can facilitate the learning process as well as curriculum innovation in improving the implementation of learning in accordance with the times.

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