# TPACK Approach in the Context of Special Needs Students: Reflections from the Field

Ika Candra Destiyanti(✉) and Firda Halawati

Faculty of Teacher Training and Education, Universitas Islam Al Ihya Kuningan, Kuningan, Indonesia
ikacandradestiyanti@gmail.com

**Abstract.** Representation of students with special needs who attend school during the covid period by distance learning is a social phenomenon that is a dilemma. Online learning, which requires independent student learning at home by independently accessing learning resources and completing coursework assignments online, becomes a problem for students with special needs who need learning assistance in their daily lives. Research Objectives is Represents the use of TPACK for students with special needs in online and offline classes in a personal dimension. This research was examined using a qualitative narrative method to track technological, pedagogical, and content developments (TPACK) for students with special needs studying in higher education. This study uses a Hargreaves narrative research design, so that it can explore the feelings of students with special needs, especially in the dimensions of physical/personal geography. This geographic dimension affects social interactions which are limited by personal factors where the emotional closeness that occurs in blended learning during the COVID-19 period will affect the emotional geography of students with special needs. The relationship between lecturers and students with special needs, the relationship between students with special needs and parents of students and the relationship between students with special needs students and the relationship between students with special needs and students with special needs becomes a research analysis that will be studied and studied so that it affects the level of understanding of students with special needs to find meaning in each lesson. Learning gained through online and face-to-face media. Using the blended learning learning method after COVID-19, students with special needs experienced obstacles in using digital learning media that were less disability-friendly, thus making them have obstacles in understanding learning materials both in learning at home and in class. The research findings highlight how students with special needs experience obstacles in adapting to individual differences, being friendly with lecturers' learning techniques in online classes, adapting to online and offline class room situations, lack of completeness of disability-friendly learning facilities, so students try to adapt disability-friendly technology transfer that helps them in understanding pedagogy through modified technology as a solution for students with disabilities to understand and reflect on each learning material in the classroom and at home. The TPACK approach for students with special needs involves the educational context of motivation/involvement, assessment, feedback, adaptation, and communication provided by lecturers at campus and parents at home as a study buddy. The implications of this research are modified technology for students with disabilities as a


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creative space to search, find, analyze and reflect on learning through educational content and pedagogical knowledge.

**Keywords:** blended learning · feedback · TPACK · special needs students

## 1 Introduction

During the pandemic, learning used a lot of online media in every education unit from early childhood to tertiary institutions. And according to research results [1] that teachers use a lot of access to technology and communication in learning in this era. However, data in the field shows that optimizing the use of TPACK in online classes is still far from expectations. These barriers are also consistent with the findings [2] Regarding the role of TPACK in classes that are not aligned between technologies in curriculum literacy or teacher feedback in online classes. The role of the teacher is in teaching while digital technology is used in different ways add value to teaching, few do using teaching methods effective in the use of technology in teaching their literacy and content. According to other researchers [3], "teaching is a complex cognitive skill which occur in environment which dynamic and no structured" so that in this covid era learning can be adapted to the covid 19 emergency situation.

Knowledge content pedagogical technology (TPACK). [4] on pedagogical content knowledge (PCK), TPACK, as recommended scientist [5], regarding a conceptual frame work that describes how lecturers can communicate understandings of the interaction of technology, pedagogy, and content when planning instruction learning is done.

The TPACK framework itself has become an interesting title, it has been attracted and dis cussed scientifically by educators and researchers, as evidenced by approximately 600 publications across major disciplines currently indexed in the base data Scopus, as well as approx 350 publications which collected on the Web of Science.

Teaching in era digital more complex with fast development tool and technology digital for learning in the classroom [6]. However, many users do not experience optimal access to learning content [7]. When lecturers who teach in class are able to integrate ICT available, often appear election tool than goals instructional or pedagogical is at in line front taking decision instructional [8]. Though thereby, in view we, use technology which effective depend on strength teacher in plan instructions literacy based standard which strong in whole content field.

TPACK learning for students with disabilities in tertiary institutions is the focus of this research where previous research related to the findings of TPACK learning through the lens of emotional geography the professionalism dimension of students with disabilities in distance learning where campus learning ecosystems are carried out from home that rely on various learning resources to process TPACK starting and motivation/cam pus and Home engagement, assessment, feedback, adaptation, and communication [9] Whereas gifted special needs students who study in public universities are generally seen from a sociocultural lens to be able to adapt to the technology used by lecturers during online learning but for assistance with learning services and careers they need to be ac companied intensively [10].

Instructional Design in distance learning for both general students and students with disabilities must meet the rules of a learning experience where they can read, write, study, and collaborate in a manner virtual with person other (for example, [11–13] How-ever, the weakness in online learning is that the lecturer as a transfer of knowledge cannot serve the wishes of students in intensive group discussions in online classes. [14]| Is necessary to prepare teaching staff not only as conveyers of information in online classes but as content literacy teachers and facilitate as moderators of discussions in online classes. [11] and other (for example, [15, 16], criticizing the urgency of online learning in tertiary institutions, how the output of these learning outcomes is being able to be competent in the fields of knowledge they study in online classes so that the expertise in study programs can be used in their professional work when they graduate from college. The purpose of this research is to explore practical practices. Students with disabilities using TPACK in online classes during the pandemic.

## 2 Methods

### 2.1 Prosedure

The method in this study uses a qualitative method in which students with disabilities will be explored in using TPACK in online classes during a pandemic. This research uses a qualitative approach to describe the representation of students with disabilities in colleges in using TPACK ("what" happened) and in-depth ("why" it happened). Play a fundamental role in shaping social reality" [17]. The author uses 3 students with disabilities from 3 study programs at Islamic tertiary institutions using sociocultural theory. Students with disabilities are identified in the use of digital content, pedagogic and instructional design tools in online learning. These students with disabilities have criteria that have adapted to technology that is adapted to their physical condition so they use learning technology with cellphone and computer media adapted to audio besides that they have used learning media for more than 3 years so that they are increasingly proficient in using cellphone and telephone access modified According to the method used [18], we attempted identify students with disabilities in public universities how they carry out TPACK practices in online learning classes during a pandemic. The data presented in this study illustrates how online learning in which one of the students is a special needs student with visual impairments and motion learning practices using TPACK is integrated with technology that is disabled friendly and the teacher's role in providing literacy instructions the content worthy for analyzed with careful. By because that, for article needs this, method studies case descriptive [19].

### 2.2 Source Data

He research team observed participants in the online class for 50 min in 14 meetings. The research team entered the online class of lecturers who teach students with disabilities where the lecturer integrates technology with the learning content of the sociocultural approach of students with disabilities with general students in online learning. This is the main focus, which consists of motivation, discourse, involvement of students with

disabilities, learning experiences and how they actively express opinions in online media. Besides Therefore, focusing on how technology is used in online learning dis course so that they are actively involved in online learning can be more meaningful.

### 2.3 Data Interview Semi-Structured

This study conducted semi-structured interview data with 3 participants, two participants with visual impairments and one participant with movement disorders. Observations were carried out through semi-structured interviews and direct observation with a total duration of 50 minutes per meeting. Interview data recorded use recording next audio and video transcribed based on research objectives the information collected is how the practice of learning practices using TPACK on students with disabilities so that the information obtained is in the form of learning planning and participant decision making, and for clarify and expand findings from data observation. Protocol Interview semi-structured used for guide Interview this.

### 2.4 Data Ingredient Teach

As long as the teaching material data is in the form of learning resources and plan lesson and learning activities during online lectures in class and the research team also reviewed the sources of learning material in online classes observed during 14 material meetings and providing them was not a requirement to participate in this study. However, because ingredient teach this discussed in Interview recording audio, ingredient teach the considered in analysis. The findings obtained from the review of these documents are used to contextualize and add depth data observation and interview.

### 2.5 Data Ingredient Teach

The data that has been transcribed is then analyzed using qualitative analysis theory [20], then coded based on the TPACK. Framework and sociocultural learning theory [21]. Code for TPACK based on factor analysis research redefining the TPACK domain [22]. Consists of TPACK, TK, PK, TPK, and PCK, as well four types of content knowledge: literacy content knowledge (CKL), math content knowledge (CKM), science content knowledge (CKS), and social studies content knowledge (CKSS).

Next, the coding is for proof perspective sociocultural The PLUS code covers the use of technology by lecturers to see student interactions using technology in online classes and how students with disabilities interact with general students in online classes. The technology used by lecturers is not only a learning aid but how to support content and learning discourse such as student involvement in finding learning material through Google Scholar or how students discuss material topics through open blogs. TPACK and sociocultural theory provide an alternative learning where students can express field facts through the use of technology as a navigational tool and how they write public opinion well, this can create context. in the development of social literacy.

# 3 Result

## 3.1 Context Students Learn in Online Classes

Instructions for reading literacy in online classes are given by lecturers by providing material in PDF form to students to be able to review in discussion via online mode. Reviewing learning materials in the form of articles is suggested so that students can think analytically and critically towards social issues that are currently developing. Each group is given a social issue which will be discussed through a breakout room class with a duration of 30 min and then they will present a review of the article with a duration of 15 min. The research team observed for 50 min students with disabilities who studied in online classes with other general students. They have to prepare for social adaptation with general students and how they adapt to learning material in text form.

Through system talk Back [23] Students with disabilities not only transferred pdf writing through the talk back system to audio the research team also noted in the results of field notes that students with dis- abilities made small notes in audio form and then their group mates transferred the audio results in text form as a review report on [24] review reading literacy through reviewing articles that reading patterns and reviewing readings will better understand the lesson plans that will be conveyed in more depth so that researchers also study the lecturer's learning plans before giving lessons so that when students review the results of the writing the themes presented are in conformity with the lecturer's learning plans.

In the first observation, we focused on observing students with visual impairments how they responded to the reading resources delivered by the lecturer at the beginning of the lecture. The first lecturer started with a brief lecture on learning materials with the theme of educational psychology in teaching. Students with disabilities along with other students are given time to respond to issues previously posted via Google Classroom. The lecture agenda consists of describing issues of educational psychology in schools, then after being described, students who are divided into small groups are instructed to identify based on global issues and local issues by recommending research research related to the theme of educational psychology in teaching after being identified according to global issues and local issues, the next activity is to analyze primary sources with the results of student worksheets so that there is relevance to suit the teaching plan. The next step is students with disabilities with general students to respond to global issues and local issues related to educational psychology themes in teaching and at the end of the activity the lecturer responds from opinions. Opinions conveyed by students in class discussions.

## 3.2 Data

For 50 minutes observing students with disabilities with general students in formulating global issues and local issues, students with disabilities only managed to read one text which he transferred via audio. The duration of transferring text from audio to text takes about 10 minutes and rereading through audio which they speed up to 2 times takes 20 minutes so students with disabilities During class activities students with disabilities have a higher efford to learn the test material compared to general students.

The unavailability of technology that facilitates students with disabilities with visual impairments is an obstacle for students with disabilities to learn learning material faster. Facilitating students to discuss together through Google meet in the breakoutroom class makes students more intensive in expressing opinions and collaborating to find global issues as well as local issues. Lecturer applies differentiation social-emotional while model score collaboration in environment work [25]. Enable students with disabilities to play an active role in small classes. Those with visual impairments are assisted in taking notes.

Through reading literacy in online classes through breakout rooms, general students and students with disabilities collaborate to determine global and local issues according to the themes given by lecturers according to lecture plans. Students with disabilities can contribute their opinions in small classes by being assisted by general students in writing their opinions in text form. TPACK helps students with disabilities understand teaching content and technology in exploring global and local issues of educational psychology in teaching.

### 3.3 Context Students Learn in Online Classes

After the discussion activities the lecturer gives additional assignments that are done outside the classroom. They are given homework whose assignments are given through Google Classroom with a working period of 2 days. From this system it will be seen which students are doing their assignments on time or late. The discipline of students in completing individual assignments will be seen from the time they are done and the work results that are deposited through Google Classroom. This system avoids students copying other students. They have their own personal space to collect individual assignments and the lecturer responds to their individual assignments privately without the knowledge of other students in their class. In its implementation, the lecturer allows assessing student results in a credible manner without being influenced by the responses of other students. During Interview post-observation, the lecturer explains the reflection with this individual assignment is to provide students with the same understanding through feedback given by the lecturer in their individual assignments. They will still be monitored to continue to revise the results of their assignments so that they are in accordance with the same under standing as other students.

Students with disabilities need assistance in their individual assignments [26]. The learning experience in general classes makes students have to learn even more because the available technology cannot yet access audio-based learning. Learning materials in video form are preferred by students with visual impairments (Participant 1, 2022) In numeracy literacy, it is known that 2 out of 3 students with disabilities have a lower achievement index score compared to non-numeracy courses. They have difficulties in understanding arithmetic in college classes. Learning videos for math material are more recommended by them so they can repeat learning material at home.

## 4 Discussion and Implications

Content Literacy for learning materials in tertiary institutions, especially for students with disabilities, is more recommended [11]; because from the field data obtained students with disabilities have many obstacles when taking online classes at home with accompanying family members. They need detailed and clear guidance to understand the learning material so that before they understand the learning material they can also master study skills at home, especially in analyzing learning resources, how to do research, and synthesize information from various sources to draw conclusions.

Lecturer activities in the educational psychology class illustrate that students understand learning content by selecting and sorting out which global issues and which local issues.

Furthermore, with TPACK instructions, students have learning experience by discussing and collaborating with other students and expressing their opinions through online classes. This has a tendency for students disability can study and participation community which meaningful. General and disabled students in the same class are able to collaborate determined by three element content, pedagogy, and technology and interaction complex in Among element- element this in context certain" [27].

Findings from study this have implications related to reading literacy, especially for students with disabilities, how lecturers illustrate learning material in online classes and how to instruct content with the technology used. While technology as a means of learning in online classes is available, it is still inadequate for students with disabilities, especially those with visual impairments. They need a span of time translating text content into audio and reviewing it into text content manually. This hinders students with disabilities from submitting their coursework on time. Although the lecturer demonstrates knowledge technology, pedagogical, and content by using tools digital which available but still not able to facilitate students with disabilities to understand learning materials according to the vulnerable time provided to general students. Lecturers must give a longer time dispensation to students with disabilities.

Through inclusive education in tertiary institutions, students with disabilities have the same right to get an education in tertiary institutions but in reality on the ground. Only a few use this inclusive education. Those who graduate from Special Schools generally work that can be accessed by workers with disabilities, one of which is doing business, being a shop assistant, being a singer, or being an entrepreneur. The small number of people with disabilities who continue their education to tertiary institutions is due to several factors ranging from financial problems, social adaptation, lack of disability-friendly access to bullying. For students with disabilities, they are very close to the 3 big sins in the world of education. Students with disabilities are vulnerable to bullying in class, sexual violence and issues of intolerance. So that students with disabilities are included in vulnerable groups in society.

TPACK and disability are a new paradigm that few experts study. For people with disabilities with visual impairments, technology is a tool for them to help solve problems in their daily lives. Students with disabilities usually use gadgets with the Talkback application to inform their relatives or colleagues with disabilities. The silent world for them will ripple with the use of technology in their daily lives. Technology for

students with disabilities with speech impairments is a social color for them. They can still communicate in cyberspace just like other students.

TPACK makes it easy for them to communicate and interact with their peers without barriers and access to technology to collaborate will enable them to catch up in accessing information in the form of digital reading. Disability-friendly TPACK how access to audio in the form of PDF books is still inaccessible, even for students with disabilities who take civil engineering, mathematics, and graphic design, there is no software that can read and translate images to sound. Symbol to sound, graphic to sound and chart to sound. So this creates barriers to students with disabilities accessing learning. Special assistants for students with disabilities, especially those with speech and visual impairments, are still very much needed by them in accessing technology-based information.

The hope is that students with disabilities can access all information easily without the help of special companions so that they can be further independent in learning. Students with disabilities currently try to understand material in technology more than 2 to 3 times because they not only have to download the material in PDF form, but the document must be transferred in voice form and respond to the document in written form again before finally sending it to lecturer as a coursework.

**a.** ***Research Limitations***

This study looks at how students with disabilities practice in general classes using TPACK in their learning practices and shows how lecturer instructions play an important role for students with disabilities and general students understand learning content, but further research is needed on how technology is suitable for students with disabilities in general classes so that students with disabilities are not have a different time frame than general students in understanding learning material.

Like which suggested [30, Technology as a digital tool changes the nature of social interaction in order to provide more humane learning so that it is more likely for students to collaborate and have a good learning experience. With digital technology, general students and students with disabilities have equal opportunities to get better learning, contribute more and participate more strongly.

## 5 Conclusion

The TPACK design in learning provides recommendations to lecturers as teaching guidelines that synergize with technology and how students can interact using digital devices so that the learning atmosphere during a pandemic is more meaningful even though using online learning with a home atmosphere

This research provides a positive response to online learning difficulties during a pandemic because TPACK has enormous potential to help those experiencing learning difficulties at home online and lecturers can focus on content literacy by demonstrating their ability to carry out learning humanely and in synergy with technology that is right on target. With the needs of students with disabilities. With TPACK learning Students with disabilities understand learning material without experiencing difficulties because the role of the lecturer actively providing disability services is the same as the active role of the lecturer face-to-face in class with the lecture method. Through technology, lecturers continue to show their role in guiding and motivating students with disabilities

in general classes to keep trying like students in general. The next recommendation is that the role of TPACK bridging the world of business and industry for students with disabilities in getting a position in their job after graduation is a suggestion for further research.

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