

Design Model Mix Blended Universal Design Learning In University

Wiwik Dwi Hastuti^{1*}, I Nyoman Sudana Degeng¹, M. Efendi¹, Henry Praherdiono¹

¹Universitas Negeri Malang, Indonesia

* wiwikdwi.fip@um.ac.id

ABSTRACT

Students with special needs can study with regular students at the tertiary level; they need facilities according to their characteristics. Students with visual impairments need audio learning programs, while students with hearing impairments need visual learning. To meet these students' learning needs, it is necessary to develop a learning model that allows them to study thoroughly. The research objective is to develop a mixed, blended universal design learning model that is effective for learning activities. This research uses research and development. The development method uses the ADDIE model. The assessment given by the experts was analyzed using the Content Validity Index (CVI) formula. The conclusion obtained was that the learning design model developed was following the Mix Blended Universal Design Learning (MixBUDL).

Keywords

Blended Learning, UDL, Blind, Deaf

Article Received: 18 October 2020, Revised: 3 November 2020, Accepted: 24 December 2020

Introduction

Inclusive Learning in Indonesia began to be implemented around the 1990s. The implementation of inclusive education is not limited to kindergarten to high school levels. ABK (students with special needs) who graduated from SMA and SMK has a high interest in continuing his studies at Perguruan Tinggi on independence and a future career. State University of Malang (UM) is one of the universities that provide inclusive education. In the even semester of 2019/2020, 28 students with special needs enrolled in various study programs at UM. With the existence of students with special needs who study together with regular students, it needs to be accompanied by real actions that can facilitate the study of students with special needs.

UM has made changes in the management of infrastructure funds to access them with special needs. The accessibility of the facilities and infrastructure sector is mainly applied to the construction of new buildings (Rectorate building, FIS building, FIK building, and PPG building). Simultaneously, several buildings have been rehabilitated with various adjustments for access to students with special needs with ramps, namely the E2 building, E3 building, Building D2,

Building D6, and the Central Library building. Apart from adjustments to the facilities mentioned earlier and infrastructure, preparation for the learning aspects also requires serious thinking so that students with special needs can learn and excel as regular students. To meet student study fluency needs, a Student Activity Unit called the Disability Care Student Movement (UKM Gempita) was formed. UKM Gempita prepares regular students to accompany students with special needs while studying in class and outside the Classroom.

The development of a continuous learning system is essential to do in order to achieve more optimal educational goals. As part of this effort, some researchers have developed an online-based learning system at the University to overcome the limitations of distance and time that have been complained of (Surahman et al., 2019). This is based on the finding that most students in Indonesia tend to be interested in free visual space, which can be overcome through the online learning process (Sudatha, Degeng, & Kamdi, 2018). The next development is the Adaptive learning analytics management system model combined with inquiry-based learning that seeks to accommodate students' adaptive ability in the learning process that has so far been deemed

lacking (Laksana, Dasna, & Degeng, 2019). Conceptually and empirically, this is part of educators' increasing self-regulated learning in students (Midun, Degeng, Kuswandi, & Ulfa, 2019). A good curriculum in integrating student learning is also an important part that needs to be addressed as capital to increase self-regulated learning, which impacts the quality of student learning outcomes (Pionera, Degeng, Widiati, & Setyosari, 2020).

The preparation of Educators and Education Personnel is also a significant focus. In particular, UM has not prepared teaching staff who can serve students' learning needs with special needs in various study programs at UM. To facilitate the learning process, students with special needs rely on the assistance provided by Gempita UKM. UM has had ten years of the unique education study program (PLB) located at FIP UM. The PLB Study Program educates students to become educators for children with special needs in TKLB, SDLB, SMPLB, SMALB, and inclusive schools for kindergarten to high school levels. During the ten years of managing learning, the PLB department has graduated around 600 students. These graduates have devoted their knowledge in various provinces throughout Indonesia, including (Riau Islands, Lampung, West Java, Central Java, East Java, Bali, NTB and NTT, Kalimantan, Sulawesi, Maluku, and Papua). Managing learning to prepare students for education for children with special needs is not an easy job, especially in the learning process; students with special needs study together with regular students. Educators and education staff should provide excellent service to all students so that students with special needs can excel and complete their studies on time. During the ten years of holding the PLB FIP UM learning process, around 12 students with special needs graduated and experienced visual impairments and hearing and speech impediments.

The PLB department's learning process where students with special needs study together with regular students needs their energy in preparing

RPS, learning media, and learning resources to access everything with special needs. Microlearning subjects have different characteristics from other subjects, and the lecture material contains theory, which contains learning videos and learning practice materials. At the level of the delivery of the theory, a video of learning necessary teaching skills is played (Zamroni, Muslihati, Lasan, & Hidayah, 2020). The video is intended for regular students, so there needs to be an adjustment for special needs (visual barriers and audience speech barriers). In the theory presentation so that students with special needs can absorb well, it is necessary to explain from the lecturer and assisted by regular students (Nkansah & Unwin, 2010) regular students to accompany and hint at the lecture material. Students with special needs practice together with regular students in one group at the level of learning practice matter and end with independent learning practices. Student ability is measured through the ability to design lessons (RPP) and practice the lesson plans in learning.

Literature Review

Rebecca M. Majinge (Majinge & Stilwell, 2014) with an article entitled ICT use in information delivery to people with visual impairments and on wheelchairs in Tanzania Academic Libraries: the research results show that *(The study found that ICTs facilitated information provision for people with these disabilities but that there was no adaptive or assistive equipment in Tanzanian academic libraries for them. Academic libraries should install assistive ICT equipment to facilitate information delivery easily, independently, and remotely to people with visual impairments and wheelchairs.* Golfred Bonnah Nkansah & Tim Unwin (Santrock, 2017; Uğur, Akkoyunlu, & Kurbanoglu, 2011) with an article entitled The contribution of ICTs to the delivery of special educational needs in Ghana: practices and potential. States that *all too often people with disabilities are marginalized in discourses and debates about the use of ICT in development*

practice, especially in the poorer countries of the world

Rebekah McPherson, B.F.A., M.S (McPherson, 2010) states *International distance learning in special education: A program evaluation of a US-Ecuador Collaboration*) research aims to perform this formative evaluation on the first two courses by using a model that incorporated the multifaceted nature of assessment, took place at the midpoint of the four-course program, while the final two courses were underway). Susie L Gronset (Zimmerman & Kulikowich, 2016) in the article *Factor impact the use of assistive technologies to support secondary students with mild disabilities*. It was noted that *It was found that about a quarter of the students in the analytic sample use AT. Students in the mathematics classes were four times more likely to than students in other subjects are in classes that incorporated whole class computer-based activities were more than twice likely to uses whole classes that rarely incorporated activities taught general education teacher who disabilities included in their classes were half as likely AT than students taught by general education teachers who felt they adequately prepared.*

Mary Frances Hanline, Rima 1. Hatoum, and Jennifer Riggie (Hanline, Hatoum, & Riggie, 2012) in the article *Impact of online coursework for the education teacher orf student with severe disabilities: Utilization of Knowledge and its relationship to teacher perception of competence*. This research aims to *The first was to explore how practicing teachers of learners with severe disabilities applied in their teaching the information provided in distance learning courses; the second purpose was to explore the relationship between the application of course content and the areas of course content in which teachers perceived themselves to be more competent.*

Suchitporn Lersilp¹, Supawadee Putthinoi¹ & Nopasit Chakpitak, mei,(Lersilp, Putthinoi, & Chakpitak, 2016) in the article *Model of providing assistive technology in special education schools*.

Results of the research known that *a category of assistive technologies was provided for students with disabilities, with the highest being "services," followed by "media" and then "facilities."* Furthermore, most students with physical disabilities were provided with assistive technologies, but those with visual disabilities needed it more. Finally, the model of providing assistive technologies was composed of 5 components: *Collaboration; Holistic perspective; Independent management of schools; Learning systems and a production manual for users; and development of an assistive technology center, driven by three significant sources such as Government and Private organizations, and Schools.*

Some of the relevant literature states that children with special needs (children with visual impairments, children with hearing impairments, children with mild intellectual disabilities, and children with physical and motor impairments who must use wheelchairs) at various levels of education can be managed by offline learning. And online. In online learning, assistive technology, videos, games, and others can be used according to the school level.

The basic philosophy of the model's design is to pay attention to the goals of education in the 21st century, not just mastery of content knowledge or the use of new technology. This is mastery of the learning process. Education must help transform novice learners into skilled learners, individuals who want to learn, who know how to learn strategically, and who are well prepared for lifelong learning in their highly individualized and flexible way. Universal Design for Learning (UDL) helps educators meet this goal by providing a framework for understanding how to create a curriculum that meets all learners' needs from the start. The UDL Guidelines, an articulation of the UDL framework, can help anyone planning lessons/study units or developing curricula (objectives, methods, materials, and assessments) to reduce barriers and optimize challenges and support meet the needs of all learners from the start. They can also help

educators identify barriers found in existing curricula. However, to fully understand these Guidelines, we must first understand what UDL is (Mealha, Pcd, & Version, 2011)

Students with Hearing Disabilities (ECS: Code 30; Grades 1 - 12: Code 55) are students who are identified with mild to moderate hearing disabilities who: 1) Have a hearing condition that affects speech and language development and impairs learning abilities; 2) According to one of the more commonly used classification systems, having a mild hearing loss of 26 to 40 decibels or a moderate hearing loss of 41 to 70 decibels without assistance in the ear is better above the normal speech range of 500 to 4000 Hz⁵. While students with Visual Disabilities (ECS: Code 30; Grades 1–12: Code 56) are students who are identified with mild to moderate visual disabilities who: 1) Have a minimal vision that interferes with their learning abilities and requires modification of the learning environment. ; 2) the child is stated to have a limited vision with a visual acuity of less than 20/70 (6/21 metric) in the eye which is better after correction, and/or reduced field of vision.

Selection of dimensions Universal learning design (UDL) is a set of principles for designing a curriculum that provides equal opportunities for all individuals to learn. UDL is designed to serve all students, regardless of ability, disability, age, gender, or cultural and linguistic background. UDL provides a blueprint for designing objectives, methods, materials, and assessments to reach all students, including those with diverse needs (Rose, 2001)

Grounded in research on student diversity and effective teaching arrangements, UDL principles call for flexible and flexible ways to 1) present or access information, concepts, and ideas ("what" learning); 2) plan and carry out learning tasks ("how" to learn), and 3) engaging - and staying involved - in learning ("why" learning). UDL differs from other approaches to curriculum

design in that educators initiating the design process expect the curriculum to be used by a wide variety of students with diverse skills and abilities (Mardani, Cheraghian, Naeeni, & Zarifsanaiey, 2020; Rose, 2001).

The UDL framework is based on three principles 1) multiple ways of representation using different methods of presenting information, providing multiple means of support; 2) different ways of acting and expressing provide students with alternative ways of acting skillfully and showing what they know; 3) multiple ways of engagement capitalize on learners' interests by offering a choice of content and tools; motivates students by offering a level of challenge that can be adjusted (Majinge & Stilwell, 2014; Rose, 2001; Wang, 2014).

UDL does not conflict with other methods and practices that incorporate and support many of the current research-based approaches to teaching and learning, such as the following: 1) Cooperative learning (group work); 2) Differentiated instructions; 3) performance-based assessment; 4) Project-based learning; 5) Multisensory teaching; 6) The theory of multiple intelligences, and 7) The principles of student-centered learning (Ghabanchi & Behrooznia, 2014; Rose, 2001; Scott, Thoma, Puglia, Temple, & D'Aguilar, 2017). Then in five phases in the integrated dynamic process of UDL implementation, adapted from (Nelson & Specialist, 2014) and smooth and recursive, with three focused objectives. The five phases include: Explore, prepare, integrate, scale, and optimize (Figure 1) Whereas CAST UDL is for 1) knowing how to implement UDL properly? 2) how do we measure the "success" of implementation? 3) how to gain capacity in practice UDL? (Meo, Currie-rubin, & Learning, 2015).

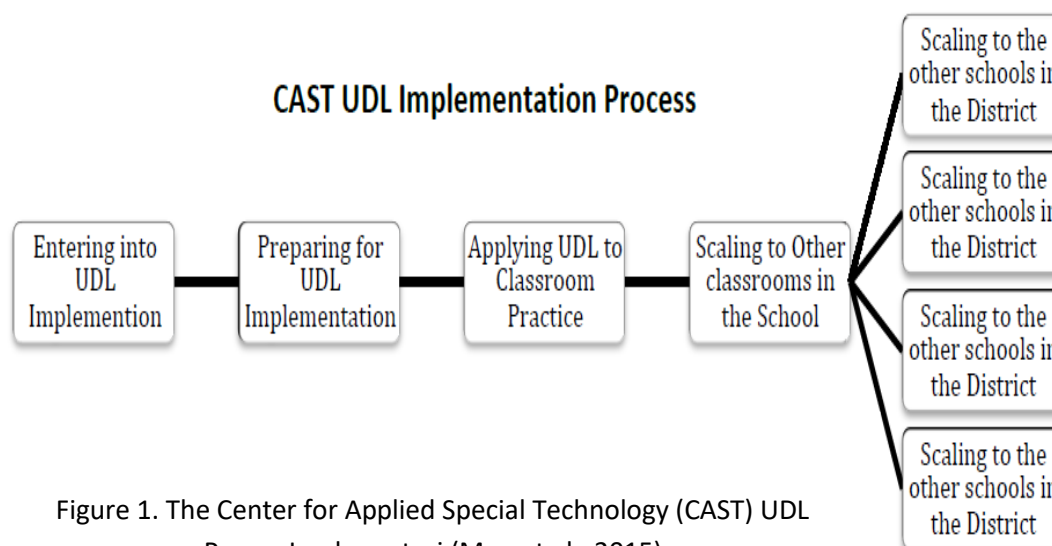


Figure 1. The Center for Applied Special Technology (CAST) UDL
Proses Implementasi (Men et al., 2015)

The use of CAST in the design of learning models to support educators as they are involved in learning about and applying Universal Design for learning into everyday educational practices to maximize the learning experience for all (Scott et al., 2017). UDL does not have to be linear, which means these steps can be read independently, or the reader can choose to review all

of them at once. In addition to following an effective lesson planning cycle (Figure 2) (Landau, Nelson, & Keefer, 2015; Nelson & Specialist, 2014), the actual use of the UDL framework becomes the practice of reviewing guidelines and identifying support and strategies that are in line with those guidelines with a focus on creating the most accessible environment possible. For all students.

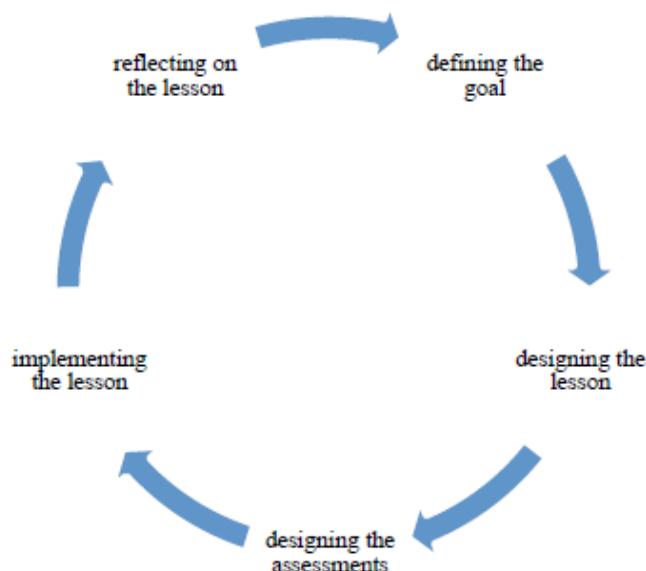


Figure 2. Effective lesson planning cycle (Nelson & Specialist, 2014)

By creating teaching, the environment is usually defined by the four walls of the Classroom. The environment expands when we consider any space in which learning takes place. This may include hallways, libraries, cafeterias, outdoor settings, and even with or without the technology embodied in instructional media. Through the principles of Engagement, Representation, and Action and Expression, UDL helps to consider all the ways to create a learning environment that is as accessible as possible for all students (Mealha et al., 2011; Plagens, 2011; Scharff, 2004).

To make it easier for students to take part in learning, the design of the CAST UDL model that uses an effective planning cycle is combined with Blended Learning: Not just a combination with Blended learning; in general, it is understood as a learning process that combines face-to-face and online learning. According to Thorne, there is a basis that blended learning is a response to the existence of advances in online technology with traditional learning best practices. He stated that blended learning is an opportunity to integrate innovation and technological advances offered online with the interaction and participation offered in traditional learning (Anis Chaeruman, Wibawa, & Syahril, 2018; Chaeruman, 2019)

Watson explains blended learning as the convergence between online learning and face-to-face learning. He firmly states that blended learning combines the best components of online learning and face-to-face learning (Anis Chaeruman et al., 2018; Uğur et al., 2011). The same thing was also expressed by Graham, who defined blended learning as a combination of learning from two historically different models of the teaching and learning process, namely between the traditional learning system (face-to-face) and the distributed learning system (Chaeruman, 2019; Tempelaar, Rienties, & Giesbers, 2009). The distributed learning system occurs because of the utilization of the tremendous potential of electronic technology,

especially computers, and the internet, making it possible for anyone to learn anytime and anywhere. Furthermore, Bonk and Graham stated that blended learning combines the positive aspects of two types of learning environments, namely classroom learning and e-learning (Arung, Rafli, & Dewanti, 2019; Language & Teacher, 2011). So, just as previously stated, in blended learning, the weaknesses in face-to-face learning can be overcome by online learning advantages. Likewise, the weakness of online learning can be overcome by the advantages of face-to-face learning. Between the two, face-to-face learning and online learning, is a historical continuity between the traditional and modern ways.

Khan, explained blended learning from a broader perspective. He stated that blended learning is a combination of strategies for delivering the right material in the right format to the right people at the right time. Blended learning combines various delivery media designed to complement one another and encourage an optimal learning process (Smith & Basham, 2019). Thus, in designing blended learning, the accuracy of choosing a combination of delivery media in both traditional and online learning settings is essential. Where the main focus is learning optimally. Besides, Khan stated that blended learning includes various activities, including face-to-face in class, live e-learning, and independent learning. All of them are a combination of traditional learning (guided by teachers/lecturers), synchronous online learning, asynchronous independent learning, and structured learning based on learners and mentors (Chaeruman, 2019; Parker, Donato, Cardone, & Cerulli, 2017).

Howard explained that blended learning is exactly two learning settings, namely asynchronous learning, and synchronous learning. Synchronous learning is a learning process that co-occurs between learners and tutors/teachers/lecturers, although it does not have to occur in the same place (Anis Chaeruman et al., 2018). Synchronous learning consists of two types. The first type is

face-to-face learning in class (Anis Chaeruman et al., 2018). Khan termed it synchronous physical format learning (McPherson, 2010; OLIVER & TRIGWELL, 2005; Smith & Basham, 2019).

Face-to-face synchronous or physically synchronous types co-occur at the same time at the same place. Examples are face-to-face learning in class, laboratory research, field trips, in-class group presentations and discussions, and other traditional learning methods. The second type is synchronous online), called synchronous virtual collaboration (C. GALCERAN & C. MUGOT, 2019), such as audio/video conferencing, chatting, live online learning,

instant messengers, and others. Asynchronous learning allows different learners to experience the same teaching material at different times and places (Chaeruman, 2019). Staley classifies asynchronous learning activities into two categories, namely collaborative asynchronous (such as online discussion forums, mailing lists, e-mail, etc.) and independent asynchronous (such as simulations, online tests, material searching, materials in the form of pdf, doc, HTML, video, etc.) animation, etc.) (C. GALCERAN & C. MUGOT, 2019). If illustrated in a table, the settings and learning activities are in the context of blended learning.

Table 1. Adopted from Khan (2005) and Staley (2007) by Chaeruman, 2013(Chaeruman, 2019)

Synchronous Learning		Asynchronous Learning	
Face to face	Virtual Synchronous	Asynchronous	Asynchronous Own
Lecturer lecture	Audio conference	Discussion forum	Online
Research in the Lab	Video conferencing	e-mail	test/assessment
group discussion	Chating	Maillingst	Doing task
		Blog	Searching material
		Wiki	Study teaching materials in various formats (text, graphics, audio, video, animation, etc.)

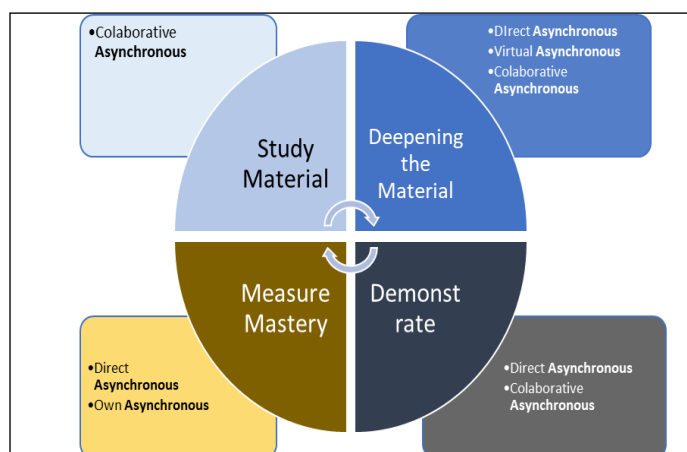
Learning strategies can be classified into various categories in different ways according to different expert opinions. In this paper, the authors refer to the classification of learning strategies according to Smaldino et al., which divides them into two categories: student-centered learning strategies and teacher-centered learning strategies (Chaeruman, 2019; Heikoop, 2013; Liou & Chang, 2008). Examples of other learning strategies, explained by Smaldino, are when these learning strategies are suitable, such as teacher-centered presentations, demonstrations, drill and practice, tutorials. While the strategy is centered on student discussions, games and simulations,

problem-solving, cooperative learning (Ahmad, Muliani, & Hardianti, 2020; Handayani & Puspitasari, 2008).

Blended learning is the right combination of selecting and determining suitable methods and tools and technology in synchronous and asynchronous learning settings according to the competencies. The next question is, what standard is the basis for choosing which one should be synchronous and asynchronous. In this context, the authors recommend using the four-quadrant concept of learning settings according to Noord, cited by Staley (Dakduk, Santalla-Banderali, & van der Woude, 2018; Santrock, 2017) and the classification of learning strategies according to

Smaldino et al. and standards of the learning process in the context of an e-learning environment that the author adapts from Horton (Gerbing, 1984).

The four quadrants of learning settings, the author of the adaptation of Noord in (Chaeruman, 2019; Wells, Warelow, & Jackson, 2009) as illustrated in diagram 1. Referring to the diagram above, it is



clear that there are four quadrants of learning settings: Direct synchronous (live synchronous), a condition where learning occurs at a time and place. Synchronous direct (live synchronous); a condition where learning co-occurs and place cooperatively. Judging from the dimensions of place and time occur at the same time. Learning settings like this occur in conventional learning, where the participants learn, and the teacher/lecturer/tutor is at the same place and at the same time, learning in class. Examples of learning methods in this context are lectures, group discussions, laboratory practices, field trips, and others.

Virtual synchronous; a condition where learning occurs at the same time (real-time) in a place that is different from one another (Zimmerman & Kulikowich, 2016). In this context, learning co-occurs, but space/place dimensions are different from one another. Examples of learning methods in this context are presentations, discussions, demonstrations, tutorials, and others using communication technology and tools such as teleconferencing: video-conferencing, audio-conferencing, or perhaps chatting (text-based conference).

Asynchronous Mandiri (Self-paced Asynchronous); a condition where learning occurs independently, anytime, anywhere according to the conditions and speed of learning. In this context, learning occurs independently of time and place. It is more open and flexible through independent learning methods. For independent learning to occur, learning participants are facilitated with digital teaching materials known as learning objects in various media formats, whether based on text, audio, video, animation, simulation, games, or a combination of these (hypermedia). Asynchronous Collaborative (Collaborative Asynchronous); a condition where learning occurs anytime and anywhere through collaboration between two or more people. Examples of learning methods in this context are discussion methods, tutorials, and questions and answers through online discussion forums, problem-solving methods, and collaborative learning through online assignments.

Strategies in learning are applied when (Poncela, 2013) ..., 1) Presentation: learners need general explanation; 2) Demonstration: learners need a process of observing before trying or implementing 3) Drill & Practice: learners need to review, repeat, imitate and practice; 4) Tutorial: learners need special guidance in some issues; 5) Discussion: learners need to think critically, explore concepts or principles; 6) Games and Simulation: learners need to review, apply and practice or apply in real situations; 7) Problem Solving: learners need to practice applying concepts and principles to solve problems; 8) Cooperative learning learners need to practice applying concepts, principles to solve problems collaboratively.

Figure 3. Learning Strategies of Blended Learning (Chaeruman, 2019)

Experiencing events are the key to a process called learning. Therefore, e-learning facilitates an optimal learning experience by properly utilizing appropriate information and communication technology to achieve the learning objectives. This learning experience can be pursued through

two continua of learning strategies, namely: 1) teacher-oriented learning (such as tutorials, presentations, demonstrations, etc.) and student-oriented learning (such as discussions, games, collaborative learning, cooperative learning, etc.). In the context of e-learning, the learning experience can be optimized with four standard learning processes, namely: 1) learning; 2) deepening; 3) applying; and 4) measuring learning success (measuring). These things can be facilitated by using ICT appropriately in four quadrants of learning settings: 1) direct synchronously; 2) virtual synchronous; 3) self-synchronous; and 4) collaborative synchronous. These four elements can be used as a framework for designing appropriate blended learning.

Method

This research uses research and development. The development method uses the ADDIE model (Lee & Jang, 2014). The purpose of this study is to produce a quality mixed blended universal design learning model design in improving students' ability to implement concepts in the second and third meeting material necessary teaching skills to close the lesson. This research focuses on the development process, the mixed, blended universal design learning model (Cheung, 2016). The research and development process is divided into three phases, namely: (1) a preliminary study including a literature review and field observation; (2) the development of model designs includes the process of developing designs, developing learning devices, learning outcomes test instruments. (3) model validation and revision includes a feasibility test from an expert's point of view.

Data Analysis

The data analysis technique is divided into three stages. First, analyzing data from expert test results on the developed product model. Expert assessment data were analyzed using the Content Validity Index (CVI) formula (Zamanzadeh et al., 2015). This analysis calculates two types of CVI.

The first type involves the content validity of individual items (i-CVI), and the second involves the content validity of the overall scale (s-CVI). The measurement scale uses a scale of 4 to avoid neutral and ambivalent midpoints. Scale used: 1 = irrelevant, 2 = somewhat relevant, 3 = moderately relevant, 4 = highly relevant (Wilson, Pan, & Schumsky, 2012). Then, for each item, the I-CVI counts the number of experts who gave the relevant assessment, namely 3 or 4. Thus, the ordinal scale dichotomization becomes relevant = 1 and irrelevant = 0, divided by the total number of experts (Christensen, Johnson, & Turner, 2014; Creswel, 2009).

Results

In accordance with the ADDIE model's development stage, before doing development, first, carry out an analysis. At this stage of the analysis, identifying student characteristics and material learning characteristics is carried out. Based on the analysis results, it can be seen that Malang State University students have good learning independence. Has facilities such as smartphones to support the mixed, blended universal design learning model. Furthermore, they have learning experiences outside the Classroom (community environment). Micro Teaching learning materials consist of theoretical and empirical materials. This Micro Teaching material has a broad scope. Micro Teaching learning aims to understand the concept of the second and third meeting material for teaching the necessary skills to open and close the lesson in daily life. This course weights two credits, 4 Js (200 minutes), meaning that the time used in learning activities is very little compared to the material's comprehensive coverage. Therefore, it needs to be supported by offline and online learning in preparing the material.

Based on the ADDIE model, the development stage is carried out after going through the analysis stage. Before developing the mix blended universal design learning model, a study of various learning theories and learning model theories was carried out to produce a mix-blended

universal design learning model integrated with Micro Teaching-learning. The development stage

of this model is described in the form of the following model design.

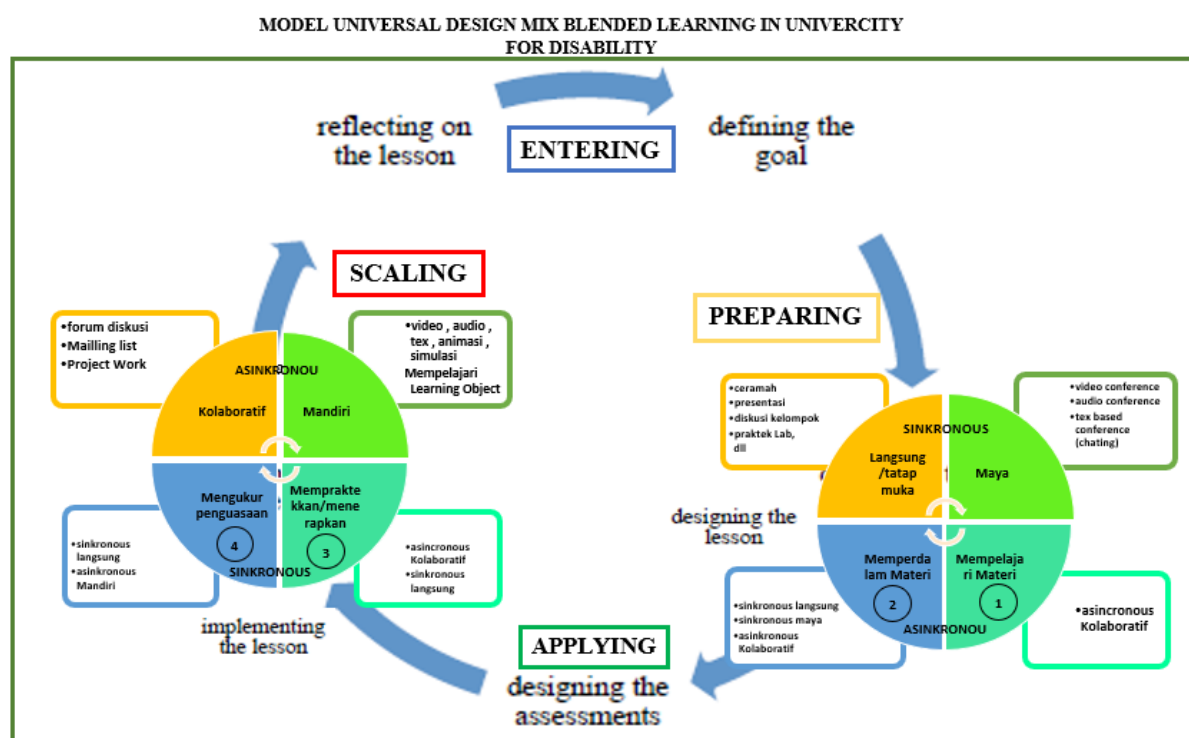


Figure 2. model mix blended universal design learning

The mixed, blended universal design learning model has four different application scenarios at each meeting. In the first scenario, online learning (students access learning materials and carry out evaluations 1 and 2). In the second scenario, face-to-face learning is developed with attention to learning progress in the first scenario. In the third scenario, the online self-learning process is developed by utilizing instructional videos as supporting learning. In the fourth scenario, face-to-face learning by discussing learning videos and students compiling lesson plans, namely the

presentation of the final results of the task of compiling lesson plans and learning practices. The implementation process of the mix-blended universal design learning model emphasizes students' active and creative thinking skills. This means that students can learn in a context that follows the material provided so that in the learning planning, offline and online designs are prepared. Because in learning activities between students have different learning styles in learning knowledge. The detailed learning steps for the mix blended universal design learning model can be seen in Table 1 below.

Table 5. Learning Design mix blended universal design learning in Micro Teaching Learning

No .	Learning Activities	Lecturer	Student	Learning Settings
------	---------------------	----------	---------	-------------------

No .	Learning Activities	Lecturer	Student	Learning Settings
1	ENTERING:	DEFINING THE GOAL:	1. 1Students can determine the appropriate methods and media to achieve specific learning objectives	1. Synchronous, 2. Virtual Synchronous 3. Own Asinkrounus 4. Collaborative Asyncrounus
		<ul style="list-style-type: none"> Formulate appropriate learning with the UDL Mix Blended Carry out an initial assessment 	2. Students can determine the appropriate learning method following the objectives to be achieved	
		SYNCHRONOUS :	Problem-solving in the Classroom as a group selects and determines the appropriate methods and media for specific given learning objectives	Synchronous Direct: Case studies in Classroom
		1. Presentation 2. Practice solving problems		
		VIRTUAL SYNKRONOUS :	Discuss cases of determining methods and media to achieve specific learning objectives via video conferencing	Virtual Synkronous: - Asynkronous Kolaboratif
		1. Presentation 2. Practice solving problems		
		OWN ASYNKRONOUS MANDIRI :	Study examples of appropriate methods and media for specific learning objectives in the text (pdf)	Own Asynkronous; Studying learning strategies in forms pdf (which can be downloaded on the web)
		1. Presentation 2. Practice solving problems		
		ASYNCHRONOUS COLLABORATIVE :	Doing individual assignments determines the appropriate methods and media to achieve specific predetermined learning goals	Assignment: group assignments (each given several cases of learning objectives to be achieved)

No .	Learning Activities	Lecturer	Student	Learning Settings
2	PREPARING	DESIGNING THE LESSON: <ul style="list-style-type: none"> Identifying student needs by providing a questionnaire Develop a learning framework following the results of the questionnaire Preparing RPP Prepare material according to student needs Creating media Develop an implementation schedule 	1. Learning; Can be achieved through presentation and demonstration strategies that can be studied independently in an independent asynchronous setting by studying digital teaching materials in various media formats. So that it can be studied anytime and anywhere 2. Go deep; This can be achieved through demonstration strategies, drill & practice, and tutorials in direct synchronous learning (demonstration and hands-on practice), asynchronous self-learning (studying video tutorials or online drill & practice). 3. Applying; This can be achieved through problem-solving strategies and collaborative learning that occur in direct and collaborative synchronous learning settings (through assignments).	Synchronous Direct: Case studies in the Classroom Virtual Synchronous and Asynchronous Collaborative Own Asynkronous Learn learning strategies in pdf format (which can be downloaded on the web)

No .	Learning Activities	Lecturer	Student	Learning Settings
3	APPLYING	DESIGNING THE ASSESSMENT: <ul style="list-style-type: none"> • Develop assessment tools • Develop an assessment schedule 	4. Measuring learning outcomes; This can be achieved through a learning outcome evaluation strategy that can occur in direct synchronous learning settings (such as performance assessments and pencil on paper tests in class) and occurs in independent asynchronous learning settings (such as taking online tests).	Assignment: group assignments (each given several cases of learning objectives to be achieved)
		IMPLEMENTING THE LESSON:	Implementing the four strategies in the four settings according to the objectives in learning with the UDL Mix Blended	
4	SCALING	REFLECTING ON THE LESSON:	Reflexing the results of the learning process to be able to conclude the learning experience with Mix Blended UDL	

The results of the development of this design are then validated by learning design experts. Learning design experts provide assessments, comments, and suggestions for revisions related to aspects of learning 1) Identify learning objectives with Mix Blended UDL. 2) UDL's Mix Blended learning approach to improving student learning

achievement in microlearning subjects. 3) Evaluation system for microlearning. 4) The learning environment in the UDL Mix Blended learning process. 5) Learning tools as facilities in the UDL Mix Blended learning process. 6) UDL Mix Blended learning process with media development.

Table 6. Expert Validation Result

Item	Expert				total	I-CVI
	1	2	3	4		
Formulate appropriate learning with the UDL Mix Blended	1	0	1	1	3	3/4 = 0,75

Item	Expert				total	I-CVI
	1	2	3	4		
Conduct initial assessment	1	1	1	1	4	4/4 = 1,00
Methods carry out the learning process	1	1	1	1	4	4/4 = 1,00
• Lecturer lectures						
• Research in the Laboratory						
• Group discussion						
Methods carry out the learning process	1	1	1	1	4	4/4 = 1,00
• Presentation						
• Practice solving problems						
Learning activities are carried out independently	1	1	1	1	4	4/4 = 1,00
Learning activities are carried out in groups	1	1	1	1	4	4/4 = 1,00
There is interaction between lecturers and students	1	1	1	1	4	4/4 = 1,00
There is interaction between students and students	1	1	1	1	4	4/4 = 1,00
Activities carried out with	1	1	1	0	3	3/4= 0,75
• Audio conference						
• Video conferencing						
• Chat						
Activities carried out with assistance, especially for students with special needs	1	1	1	1	4	4/4 = 1,00
Identifying student needs by providing a questionnaire	1	1	1	1	4	4/4 = 1,00
Develop a learning framework that is following the results of the questionnaire	1	1	1	1	4	4/4 = 1,00
Prepare RPP	1	1	1	1	4	4/4 = 1,00
Prepare material according to student needs	1	1	1	1	4	4/4 = 1,00
Create media	1	1	1	1	4	4/4 = 1,00
Develop an implementation schedule	1	1	1	1	4	4/4 = 1,00
Develop assessment tools	1	1	1	1	4	4/4 = 1,00
Arrange meetings in strategy with Asynchronous Maya settings	1	1	1	1	4	4/4= 1,00
• Students access learning videos on the link found on SIPEJAR						
• Working on pretest questions and sending answers via email						
	1	1	1	0	3	3/4= 0,75

Item	Expert				total	I-CVI
	1	2	3	4		
Arrange meetings in strategy with Synchronous settings 1 • Brainstorming necessary skills learning videos about opening and closing lessons • Planning learning in groups	1	1	1	1	4	4/4 = 1,00
Arrange meetings in strategy with Asynchronous settings • In groups to finish making learning tools	1	1	1	1	4	4/4 = 1,00
Arrange meetings in strategy with Synchronous settings 2 • Practicing basic skills learning opens and closes group learning	1	1	1	1	4	4/4 = 1,00
Reflect on the results of the presentation of learning basic skills about opening and closing lessons	1	1	1	1	4	4/4 = 1,00
Summarize and follow up on the results of each meeting	0	1	1	1	3	3/4 = 0,75
Work on the posttest using a strategy with Asinkrounus virtual settings and send answers via e-mail	1	1	1	1	4	4/4 = 1,00
Σ	2	2	2	2	Mean	0.96
	4	4	5	3	I-CVI	
Relevant Proportion	0.960.961.000.92					

Based on the data in Table 2, the I-CVI results can be seen (each item's relevance). The I-CVI calculations for the relevance of each item are shown in Table 1. Twenty-five items were marked as relevant, and the I-CVI ranged from 0.75 to 1.00. Twenty-five items have I-CVI = 1.00, and four items have ICVI = 0.75. Based on these results, it can be concluded that 25 items are considered relevant because they are more significant than 0.78. So it can be concluded that the learning design developed follows the Mix Blended Universal Design Learning (MixBUDL).

Discussions

Based on the results of data analysis, the learning design is following the dimensions of the Mix Blended Universal Design Learning, according to the advice of experts, namely: 1) in offline learning, students with special needs (students with visual and hearing impairments) are still accompanied by paying attention to their learning styles so that achievement study is equivalent to regular students. This is following the opinion of Susie L. Gronset (Santrock, 2017) that students with special needs will be able to learn and perform well if facilitated with assistive

technology according to their needs. Students with visual impairments are facilitated with audio media, and students with hearing impairments are maximized visual learning with sign language and supporting reading texts. During online and offline learning, there is still assistance such as special services for students with special needs, so that the difficulties experienced by students are detected so that solutions will be given immediately, this is following the opinion of Smaldino et al. (Heikoop, 2013) that in offline learning, 1) Presentation: learners need a general explanation; 2) Demonstration: learners need a process of observing before trying or implementing 3) Drill & Practice: learners need to review, repeat, imitate and practice; 4) Tutorial: learners need special guidance in some issues.

Conclusion

Based on the data analysis, it was obtained a score of 0.88 on an average of five validated aspects, it can be stated that the learning design developed is following the dimensions of the Mix Blended Universal Design Learning (MixBUDL). This research is still limited to developing a hypothetical model that gets evaluations from curriculum experts and learning models.

Furthermore, it is hoped that there will be efforts to apply the model directly with students' main subjects from primary education to tertiary education so that this model is genuinely fully validated both in an expert construct and empirically. Researchers suggest that subjects with hearing and vision disabilities criteria so that designs can be applied more effectively.

References

- [1] Ahmad, J., Muliani, S., & Hardianti. (2020). Millennial generation and digitization: Implementation of higher education functions. *International Journal of Scientific and Technology Research*, 9(4), 1168–1172.
- [2] Anis Chaeruman, U., Wibawa, B., & Syahril, Z. (2018). Creating a Blended Learning Model for Online Learning System in Indonesia. *International Journal of Engineering & Technology*, 7(3.36), 156. <https://doi.org/10.14419/ijet.v7i3.36.29098>
- [3] Arung, F., Rafli, Z., & Dewanti, R. (2019). I Prefer My Own Ways to Acquire My English Speaking Skills: A Grounded Research. *International Journal of Higher Education*, 9(1), 32. <https://doi.org/10.5430/ijhe.v9n1p32>
- [4] C. GALCERAN, G., & C. MUGOT, B. (2019). Three Step Interview as a Strategy on the Performance in Science of Grade 8 Students. *Journal of Education & Social Policy*, 6(1), 75–86. <https://doi.org/10.30845/jesp.v6n1p12>
- [5] Chaeruman, U. A. (2019). Merancang Model Blended Learning Designing Blended Learning Model. *Jurnal Teknodik*, 17(4), 053. <https://doi.org/10.32550/teknodik.v17i4.577>
- [6] Cheung, L. (2016). Using the ADDIE Model of Instructional Design to Teach Chest Radiograph Interpretation. *Journal of Biomedical Education*, 2016, 1–6. <https://doi.org/10.1155/2016/9502572>
- [7] Christensen, L. B., Johnson, R. B., & Turner, L. A. (2014). *Research Methods, Design, and Analysis*. <https://doi.org/10.1017/CBO9781107415324.004>
- [8] Creswel, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches. *Los Angeles: University of Nebraska–Lincoln*.
- [9] Dakduk, S., Santalla-Banderali, Z., & van der Woude, D. (2018). Acceptance of Blended Learning in Executive Education. *SAGE Open*, 8(3). <https://doi.org/10.1177/2158244018800647>
- [10] Gerbing, D. W. (1984). Campbell and Stanley for Undergraduates. In *Contemporary Psychology: A Journal of Reviews* (Vol. 29). <https://doi.org/10.1037/022808>
- [11] Ghabanchi, Z., & Behrooznia, S. (2014). The Impact of Brainstorming on Reading Comprehension and Critical Thinking Ability of EFL Learners. *Procedia - Social and Behavioral Sciences*, 98, 513–521. <https://doi.org/10.1016/j.sbspro.2014.03.447>
- [12] Handayani, R. D., & Puspitasari, N. P. D. (2008). Pengaruh terapi bermain terhadap tingkat kooperatif selama menjalani perawatan pada anak usia pra sekolah (3 – 5 tahun) di rumah sakit panti rapih yogyakarta. *Jurnal Kesehatan Surya Medika Yogyakarta*, 3(2).
- [13] Hanline, M. F., Hatoum, R. J., & Riggie, J. (2012). Impact of online coursework for teachers of students with severe disabilities: Utilization of knowledge and its relationship to teacher perception of competence. *Research and Practice for Persons with Severe Disabilities*, 37(4), 247–262. <https://doi.org/10.2511/027494813805327269>
- [14] Heikoo, W. (2013). Blended identities: Identity work, equity and marginalization in blended learning. *E-Learning and Digital Media*, 10(1), 53–67. <https://doi.org/10.2304/elea.2013.10.1.53>
- [15] Laksana, D. N. L., Dasna, I. W., & Degeng, I. N. S. (2019). The effects of inquiry-based

- learning and learning styles on primary school students' conceptual understanding in multimedia learning environment. *Journal of Baltic Science Education*, 18(1), 51–62. <https://doi.org/10.33225/jbse/19.18.51>
- [16] Landau, M. J., Nelson, N. M., & Keefer, L. A. (2015). Divergent Effects of Metaphoric Company Logos: Do They Convey What the Company Does or What I Need? *Metaphor and Symbol*, 30(4), 314–338. <https://doi.org/10.1080/10926488.2015.1074806>
- [17] Language, F., & Teacher, K. F. L. (2011). 혼합 학습 (Blended Learning) 을 적용한 한국어 교원 양성 방안* 진정관.
- [18] Lee, J., & Jang, S. (2014). A methodological framework for instructional design model development: Critical dimensions and synthesized procedures. *Educational Technology Research and Development*, 62(6), 743–765. <https://doi.org/10.1007/s11423-014-9352-7>
- [19] Lersilp, S., Putthinoi, S., & Chakpitak, N. (2016). Model of Providing Assistive Technologies in Special Education Schools. *Global Journal of Health Science*, 8(1), 36–44. <https://doi.org/10.5539/gjhs.v8n1p36>
- [20] Liou, T.-Y., & Chang, N.-Y. (2008). The Applications of Social Capital Theory in Education. *Hsiuping Journal of Humanities and Social Sciences*, 11(September), 99–122.
- [21] Majinge, R. M., & Stilwell, C. (2014). Ict use in information delivery to people with visual impairment and on wheelchairs in tanzanian academic libraries. *African Journal of Library Archives and Information Science*, 24(2), 151–159.
- [22] Mardani, M., Cheraghian, S., Naeeni, S. K., & Zarifsanaiey, N. (2020). Effectiveness of virtual patients in teaching clinical decision-making skills to dental students. *Journal of Dental Education*, (December 2019), 1–9. <https://doi.org/10.1002/jdd.12045>
- [23] McPherson, R. (2010). International distance learning in special education: A program evaluation of a US-Ecuador collaboration. *ProQuest Dissertations and Theses*, 211.
- [24] Mealha, Ó., Pcd, P. D., & Version, U. D. L. G. (2011). Universal Design for Learning (UDL) Guidelines : Full-Text Representation WHAT IS UNIVERSAL DESIGN FOR LEARNING ? *Education*, 1–35.
- [25] Meo, G., Currie-rubin, R., & Learning, P. (2015). *CAST ' s UDL Implementation Phases*. 2014–2016.
- [26] Midun, H., Degeng, I. N. S., Kuswandi, D., & Ulfa, S. (2019). Effects of inverted classroom and self-regulated learning on conceptual learning. *International Journal of Innovation, Creativity and Change*, 8(2), 181–201.
- [27] Nelson, B. L. L., & Specialist, S. U. D. L. (2014). *Five Steps to Get Started Using UDL*.
- [28] Nkansah, G. B., & Unwin, T. (2010). The contribution of ICTs to the delivery of special educational needs in Ghana: Practices and potential. *Information Technology for Development*, 16(3), 191–211. <https://doi.org/10.1080/02681102.2010.497273>
- [29] OLIVER, M., & TRIGWELL, K. (2005). Can “Blended Learning” Be Redeemed? *E-Learning*, 2(1), 17. <https://doi.org/10.2304/elea.2005.2.1.2>
- [30] Parker, W. M., Donato, K. M., Cardone, K. E., & Cerulli, J. (2017). Experiential Education Builds Student Self-Confidence in Delivering Medication Therapy Management. *Pharmacy*, 5(3), 39. <https://doi.org/10.3390/pharmacy5030039>
- [31] Pionera, M., Degeng, I. N. S., Widiati, U., & Setyosari, P. (2020). Instructional methods and self-regulated learning in writing. *International Journal of Instruction*, 13(3), 43–60. <https://doi.org/10.29333/iji.2020.1334a>
- [32] Plagens, G. K. (2011). Social Capital and Education: Implications for Student and

- School Performance. *Education and Culture*, 27(1), 40–64. <https://doi.org/10.1353/eac.2011.0007>
- [33] Poncela, A. (2013). A blended learning approach for an electronic instrumentation course. *International Journal of Electrical Engineering Education*, 50(1), 1–18. <https://doi.org/10.7227/IJEEE.50.1.1>
- [34] Rose, D. (2001). Universal Design for Learning. *Journal of Special Education Technology*, 16(3), 57–58. <https://doi.org/10.1177/016264340101600308>
- [35] Santrock, J. W. (2017). Educational Psychology. In *BMC Public Health* (Vol. 15). Retrieved from <https://ejournal.poltektegale.ac.id/index.php/siklus/article/view/298%0Ahttp://repositorio.unan.edu.ni/2986/1/5624.pdf%0Ahttp://dx.doi.org/10.1016/j.jana.2015.10.005%0Ahttp://www.biomedcentral.com/1471-2458/12/58%0Ahttp://ovidsp.ovid.com/ovidweb.cgi?T=JS&P>
- [36] Scharff, J. S. (2004). Play and very young children in object relations family therapy. *International Journal of Applied Psychoanalytic Studies*, 1(3), 259–268. <https://doi.org/10.1002/aps.77>
- [37] Scott, L. A., Thoma, C. A., Puglia, L., Temple, P., & D'Aguilar, A. (2017). Implementing a UDL framework: A study of current personnel preparation practices. *Intellectual and Developmental Disabilities*, 55(1), 25–36. <https://doi.org/10.1352/1934-9556-55.1.25>
- [38] Smith, S. J., & Basham, J. (2019). Designing Online Learning Opportunities for Students With Disabilities. *Teaching Exceptional Children*, 127–137. <https://doi.org/10.1177/0040059914530102>
- [39] Sudatha, I. G. W., Degeng, I. N. S., & Kamdi, W. (2018). The effect of visualization type and student spatial abilities on learning achievement. *Journal of Baltic Science Education*, 17(4), 551–563. <https://doi.org/10.33225/jbse/18.17.551>
- [40] Surahman, E., Kuswandi, D., Wedi, A., Degeng, I. N. S., Setyanti, D. A., & Thaariq, Z. Z. A. (2019). Adaptive learning analytics management system (Alams): An innovative online learning approach. *International Journal of Innovation, Creativity and Change*, 5(4), 413–430.
- [41] Tempelaar, D. T., Rienties, B., & Giesbers, B. (2009). Who Profits Most from Blended Learning? *Industry and Higher Education*, 23(4), 285–292. <https://doi.org/10.5367/000000009789346130>
- [42] Uğur, B., Akkoyunlu, B., & Kurbanoglu, S. (2011). Students' opinions on blended learning and its implementation in terms of their learning styles. *Education and Information Technologies*, 16(1), 5–23. <https://doi.org/10.1007/s10639-009-9109-9>
- [43] Wang, Y. D. (2014). Building student trust in online learning environments. *Distance Education*, 35(3), 345–359. <https://doi.org/10.1080/01587919.2015.955267>
- [44] Wells, S. H., Warelow, P. J., & Jackson, K. L. (2009). Problem based learning (PBL): A conundrum. *Contemporary Nurse*, 33(2), 191–201. <https://doi.org/10.5172/conu.2009.33.2.191>
- [45] Wilson, F. R., Pan, W., & Schumsky, D. A. (2012). Recalculation of the critical values for Lawshe's content validity ratio. *Measurement and Evaluation in Counseling and Development*, 45(3), 197–210. <https://doi.org/10.1177/0748175612440286>
- [46] Zamanzadeh, V., Ghahramanian, A., Rassouli, M., Abbaszadeh, A., Alavi-Majd, H., & Nikanfar, A.-R. (2015). Design and Implementation Content Validity Study: Development of an instrument for measuring Patient-Centered Communication. *Journal of Caring Sciences*, 4(2), 165–178. <https://doi.org/10.15171/jcs.2015.017>
- [47] Zamroni, E., Muslihati, Lasan, B. B., & Hidayah, N. (2020). Blended Learning based

on Problem Based Learning to Improve Critical Thinking Ability of Prospective Counselors. *Journal of Physics: Conference Series*, 1539(1).
<https://doi.org/10.1088/1742-6596/1539/1/012039>

- [48] Zimmerman, W. A., & Kulikowich, J. M. (2016). Online Learning Self-Efficacy in Students With and Without Online Learning Experience. *American Journal of Distance Education*, 30(3), 180–191.
<https://doi.org/10.1080/08923647.2016.1193801>