

# Identification of Learning Experience in Online Learning with User Persona Techniques Based on Learner-Centered Design Concepts

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## Abstrak

Pembelajaran daring saat ini bukan menjadi hal baru lagi di dunia pendidikan. Akan tetapi, dengan berubahnya sistem pembelajaran yang dilakukan seluruhnya secara daring maka tentu perlu adanya penyesuaian-penyesuaian sehingga kualitas pembelajaran tetap terjaga. Pembelajaran daring telah memberikan kemudahan dalam proses pembelajaran karena bisa dilakukan secara asinkron. Memahami *learning experience* peserta didik sangat penting untuk mengoptimalkan pembelajaran yang berfokus pada *learner-centered design*. *Learning experience* yang baik juga akan berdampak pada hasil belajar peserta didik. Oleh karena itu, perlu dilakukan identifikasi dan analisis kebutuhan peserta didik pada pembelajaran daring sehingga proses pembelajaran menjadi lebih optimal. Penggunaan teknik persona dapat memberikan informasi lebih detail untuk menggali kebutuhan peserta didik dalam proses pembelajaran daring. Penelitian ini dimulai dengan melakukan identifikasi masalah, observasi target pengguna, desain persona dan analisis persona. Hasil penelitian menunjukkan adanya beberapa kekurangan dan kendala yang dihadapi selama pembelajaran daring dan beberapa hal yang perlu diperhatikan untuk pembelajaran daring kedepannya yaitu perkuliahan agar dilakukan sesuai dengan jadwal yang telah ditentukan, memberikan lebih banyak referensi materi dan penjelasan materi yang lebih detail, memberikan video pembelajaran untuk memberikan pemahaman tambahan terkait materi pelajaran, memberikan kuis dan forum diskusi pada *e-learning* di setiap akhir materi, perlu interaksi yang lebih intens membahas materi perkuliahan, lebih sering dilakukan pertemuan *online* untuk memberikan konfirmasi dan pembahasan materi serta pemberian umpan balik pada setiap tugas.

**Kata kunci:** *learning experience*, optimalisasi pembelajaran daring, kebutuhan peserta didik, persona

## Abstract

*Online learning is now not a new thing in the world of education. However, with the change in the learning system that is carried out entirely online, of course, there is a need for adjustments so that the quality of learning is maintained. Online learning has provided convenience in the learning process because it can be done asynchronously. Understanding the learning experience of students is very important to optimize learning that focuses on learner-certified design. A good learning experience will also have an impact on student learning outcomes. Therefore, it is necessary to identify and analyze the needs of students in online learning so that the learning process becomes more optimal. The use of persona techniques can provide more detailed information to explore the needs of students in the online learning process. This research begins by identifying problems, observing target users, persona design, and persona analysis. The results of the study indicate that there are several shortcomings and obstacles faced during online learning and several things that need to be considered for online learning in the future, namely lectures to be carried out according to a predetermined schedule, providing more reference materials and more detailed explanations of material, providing learning videos for providing additional understanding related to lecture material, provide quizzes and discussion forums on e-learning at the end of each material, more*

*intense interaction is needed to discuss learning materials, more frequent online meetings are held to provide confirmation and discussion of material and provide feedback on each assignment.*

**Keywords:** *learning experience, optimization of online learning, student needs, persona*

## 1 Introduction

During the pandemic, the concept of learning has changed to online learning. E-learning is one of the media that can be used to support the teaching and learning process. E-learning is not a new thing in learning, especially in today's digital era. However, during this pandemic, all learning activities have been shifted to online learning. Direct meetings can only be done via video conference, of course, there are still many obstacles, both in terms of connections and limited interaction when compared to direct face-to-face interactions. Therefore, online learning activities are expected to be maximized amid existing limitations. The challenge is how to maintain the quality of education amid the current crisis. Quality standards in learning must be maintained so that the teaching and learning process is in accordance with the learning objectives [1].

Online learning has a flexible time in its implementation. However, students find online teaching boring and uninteresting because sometimes online content is all theoretical and does not provide opportunities for students to practice and learn effectively [2]. Research conducted by Fatoni, et.al, states that the weakness that occurs in online learning today is the lack of interaction between educators and students so unilateral interactions often occur [3]. Some students find it difficult to concentrate during learning and there are dissatisfactions such as insufficient data supply, changes in assignments, obstacles in teamwork, unpreparedness in class design, and dissatisfaction with assessment and administration [3]. Based on this, it is still necessary to make improvements in designing this online teaching and learning process.

According to Islam et al, there are five challenges faced by academics related to the success in using e-learning in an academic environment, namely learning styles and culture, pedagogical e-learning, technology, technical training, and time management challenges [4]. Based on this, it is necessary to identify learning experiences in online learning to meet the needs of students during online learning so that the learning process becomes more optimal. In addition, educators are also required to be creative and innovative in delivering material by using learning models and techniques that are in accordance with the subject matter discussed.

In creating a good learning experience in online learning, the learning process must refer to a learner-centered design. The learner-centered design model focuses on meeting the needs of students in improving the quality of learning. The goal is to make students feel comfortable when doing online learning so that learning materials can be delivered properly and students can also understand the material well. Knowing the needs and emotions of students when interacting in online learning is very important to create a good online learning experience. Emotions can affect students' internal motivation based on their interest and curiosity in learning and students' external motivation regarding the achievement of learning outcomes [5].

One method that can be used to understand user needs is the persona method. User personas are the main tool in the user-centered design approach that is used to find out what users need and what functions are best used in the system based on those needs. Personas are narrative descriptions of user groupings that include information about user characteristics, user goals, and needs [6]. The persona description is more focused on the user's behavior, namely the user's beliefs, personality, motivations, and personal desires [7]. This persona technique is used to identify and analyze the needs of users, especially students in online learning so that they can overcome the problems that have been experienced by students in the online learning process.

The persona method can be used throughout a design project to ensure designers and stakeholders stay focused on user needs. Personas are used to communicate various information regarding user behavior and user goals [8]. In this study, data was collected on the problems experienced by students in online learning, the experiences of students in online learning, things that motivate students in conducting online learning activities, how students can learn well, how students interact with other students and what students do when learning new information or mastering new skills. The results of data collection will be identified and analyzed to obtain the needs of students in online learning which is later expected to create a more optimal online learning experience.

## **2 Literature Review**

Several previous studies related to the learning experience, namely research conducted by Asgari, et al [9] found a variety of issues that negatively affect online learning including logistical/technical issues, learning/teaching challenges, privacy and security concerns, and lack of adequate hands-on training. Based on the research conducted most of the students showed a lack of engagement in class, difficulty in maintaining their focus, and Zoom fatigue after attending several online sessions. Several strategies were taken to overcome these problems, namely budget allocation for providing basic online learning equipment for both lecturers and students who need it, creating a virtual desktop environment that allows students to access the required software, organizing training workshops for students to get used to technology more. and online teaching/learning tools, providing syllabus templates for online courses including all necessary information essential as well as the development and organization of a systematic repository of resources related to online instruction.

Research conducted by Naji, et al [10] shows the need to pay attention to four factors that influence students' readiness to change to online learning, namely first, effective communication from instructors helps students understand learning needs that can encourage them to build motivation, positive attitudes, and appreciation of online learning. Second, the pedagogical model can affect students' motivation, attitudes, and self-efficacy in online learning, for example working in a project team can help reduce feelings of loneliness. Third, online independent learning can be supported by teaching activities that involve more participation through interactive activities and teamwork. Fourth, support plays an important role in facilitating successful systemic change, which means programs and instructors must monitor online teaching activities by observing student needs.

Research conducted by Deswal, et al [11] ascertain the impact of the online learning experience dimension on student satisfaction. The dimensions of the online learning experience have a positive effect on the pragmatic-pleasurable experience, use-social experience, hedonistic-exhaustive experience, and sociability experience. So it can be concluded that the dimensions of the online learning experience have a positive impact on student satisfaction.

Furthermore, there are several previous studies related to user personas, namely research conducted by Wahyuni, et al [12] related to layman's perspective in implementing requirements elicitation using user personas. The purpose of this study is to identify some information that is less effective by designing the user persona method so that HCI (Human-Computer Interaction) is more effective. With a persona approach, researchers can design systems with HCI that are more effective to produce quality software.

Then, the research conducted by Kusuma, et al [13] related to the identification of software requirements using a qualitative study with a user persona approach (case study: the process of making a practicum module with students' ability to reduce plagiarism source code cases). This study uses a persona approach to determine the needs and analyze the diversity of users who have differences in terms of age, gender, and knowledge so that it can be used as a reference in system development. The use of a persona approach to solving problems in the preparation of practicum module material with student abilities to reduce source code plagiarism cases during practicum. Data retrieval using a persona approach is then analyzed according to user needs and produces software that can manage practicum modules.

Research by Aziza [14] namely the analysis of application user needs using user personas and user journeys. This study uses a user persona map and a user journey map in designing a personal financial assistant application. User Persona Map can help create user profile categories. A user journey map can map the activities, problems, and needs of users. In addition, the user persona map and user journey map can help see the problems that exist in the user in detail and prioritize the features that must be included in the personal financial assistant application.

Next, research by Hashim, et al [15] namely finding the factors that influence the lifestyle of GenZ users for the development of exergame mobile design models. The persona technique is used to find the factors that influence GenZ's sedentary lifestyle, which can help the development of exergame mobile design models. An online survey was conducted to collect data related to the user's level of physical activity and then create a user persona. The user personas created will assist the development of future mobile exergame design models by concentrating on the factors that affect the group of GenZ activity levels.

### 3 Research Method

This research is descriptive and will be carried out with several stages of research, namely problem identification, target user observation, user persona design, and user persona analysis. Details of the research flow can be seen in Figure 1 below.

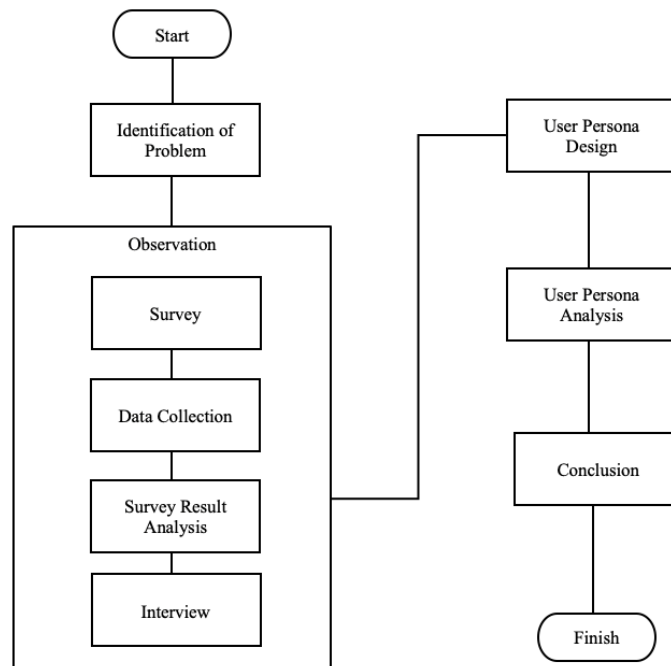


Figure 1. Research Flow

At this stage, the first identification of the problem and determine the techniques or procedures that can be done to solve the problems that have been identified. Furthermore, observations were made on the target user, namely students who became the object of this study. Observations were made through surveys by distributing questionnaires and online interviews to obtain the necessary data. Questionnaires were used to collect data quantitatively and interviews were used to collect data qualitatively. The respondents of this study were students of the Information System Study Program, Universitas Pendidikan Ganesha. After making observations, the next step is to create a user persona design. Personas are created by describing the user's demographics, goals, motivations, frustrations experienced, personality, the user needs and included informal photos. This persona is created based on the results of observations that have been made previously. Then, the next stage is to conduct persona analysis by grouping and analyzing user personas that have been created previously. The analysis is carried out to identify the learning experience of students in online learning so that the needs of students in online learning can be known.

## 4 Results and Analysis

### 4.1 Result

#### 4.1.1 Identification of Problem

The current learning that is done mostly online still poses several obstacles for both educators and students. Therefore, learning becomes not optimal. There are still many educators and students who are not ready to change the current learning system, making online learning obstacles still not resolved. Some of the obstacles that are currently still being faced in online learning are the time management of educators and students in the implementation of online learning, the lack of student motivation to learn, and the lack of interaction in learning so that students lack productive communication skills [16]. The learning experience of students using e-learning is significantly correlated with the success of the learning process [17]. A good learning experience, especially online learning, will affect students' intentions to learn [18]. By paying attention to aspects of the learning

experience of students during online learning, it is hoped that improvements made to online learning based on the learning experience of students can optimize the learning process.

#### 4.1.2 Observation

The number of samples involved to obtain initial information was 57 students of the Information System Study Program, Universitas Pendidikan Ganesha. A sample of 57 students was taken at random with the provision that they have been or are currently running online-based learning. All respondents in the sample are in the age range of 17-22 years. The demographics of the respondents, namely 65% are in Buleleng Regency and 35% are outside Buleleng, namely Badung Regency, Jembrana Regency, Karangasem Regency, Gianyar Regency, Semarapura Regency, Denpasar City, and also outside Bali, namely in Bogor, South Sulawesi, Banyuwangi and Jakarta.

Data collection was carried out quantitatively and qualitatively. Quantitative data were obtained from questionnaires given to respondents and qualitative data was obtained from open questions given to respondents. Several dimensions are used as a reference in analyzing the learning experience of students, namely (1) student self-assessment, (2) the level of student involvement, (3) the quality of feedback given and received by students, and the suitability of the assessment used, and (4) the way the subject matter is presented [19]. Based on these four dimensions, it is translated into 25 statement items. Table 1 shows the results of the calculation of data analysis based on the four dimensions of the learning experience.

**Table 1. Learning Experience Data Analysis Calculation Results**

Dimensions	Item	Percentage
Student Self-Assessment	Asking for support from educators to increase enthusiasm for learning	74,74%
	Request information on performance results	85,26%
	Applying feedback provided by educators	84,21%
	Assess self-progress	83,86%
Student Involvement	Engage in learning to stimulate enthusiasm for learning	84,91%
	Asking justification/proof of the theory given	78,60%
	Asking for alternative explanations to the theory or explanation given	82,46%
	Engage in peer evaluation	78,95%
	Engage in group projects	89,82%
The Quality of the Feedback Given and Received by Students and the Appropriateness of The Assessment Used	Feedback is given during the learning	81,40%
	Feedback is given during discussion	82,46%
	Feedback or revision of assignments before the exam	77,54%
	Feedback on group assignments	76,84%
	Feedback on the product or work	80%
	Educators provide encouragement and enthusiasm to students	82,11%
	Educators appreciate the contribution or work produced by students	84,21%
	Assessment of learning in accordance with learning objectives	83,16%
	Learning assessment is appropriate to evaluate students' understanding	82,46%
	The learning assessment is in accordance with the topic or learning material	83,51%



Dimensions	Item	Percentage
How the Lesson Materials are Presented	Submission of achievement indicators and learning objectives at the beginning of the material topic	88,77%
	Submission of assessment criteria that will be used in the learning assessment process	90,18%
	Giving examples of good assignments/work to students	78,95%
	Giving clear assignments and task objectives for each material	82,81%
	Use of appropriate learning methods	77,89%
	Providing opportunities to discuss and ask material that has not been understood	88,42%

When viewed from each item in Table 1, several aspects have a percentage value below 80%, namely asking for support from educators to increase enthusiasm for learning in the self-assessment dimension of students with a percentage value of 74.74%. In the dimension of student involvement, the aspect of asking for justification/proving of the theory given gets a percentage value of 78.60% and the aspect of engaging in peer evaluation gets a percentage value of 78.95%. In the dimensions of the quality of feedback given and received by students and the suitability of the assessment used, the aspect of feedback or revision of the assignments before the exam obtained a percentage value of 77.54% and the aspect of feedback on group assignments obtained a percentage value of 76.84%. In the dimension of how the lesson materials are presented, the aspect of giving examples of good assignments/work to students gets a percentage value of 78.95% and the aspect of using the appropriate learning methods gets a percentage value of 77.89%. Based on the results of the survey conducted, it shows that there is still a lack of interaction during learning, both interactions between students and lecturers and between students and students. In addition, there is still a lack of use of appropriate learning methods and the lack of feedback given by lecturers to students related to assignments made by students.

Based on the results of data collection using open questions to 57 samples of respondents, the results showed that 29.82% of respondents preferred independent study, 49.12% of respondents preferred group study, and 21.05% of students preferred independent study and adjusted group study with the context of the material or topic of discussion. In the online learning process, 17.5% of students prefer online learning to be done by combining synchronous and asynchronous learning where asynchronous learning is more dominant than synchronous. 31.6% of students choose online learning to be done by combining synchronous and asynchronous learning where synchronous learning is more dominant than asynchronous. 40.4% of students choose online learning to be done by combining synchronous and asynchronous learning where synchronous and asynchronous learning is carried out equally. 7% of students choose online learning to be done fully synchronously and 3.5% of students choose online learning to be done fully asynchronously.

When viewed from the learning methods that students are interested in and make students more familiar with the lecture material, the results of data calculations are 66.7% of students like case study-based learning, 56.1% of students like project-based learning, 64.9% of students like learning-based discussion and 21.1% of students liked lecture-based learning. Meanwhile, based on the learning evaluation process which is preferred by students to assess the level of student understanding of the learning material in each topic, the results obtained are 68.4% of students like the learning evaluation process carried out by giving assignments, 57.9% of students like the learning evaluation process carried out by giving quizzes with multiple-choice questions, 17.5% of students liked the learning evaluation process carried out by giving quizzes with description questions and 26.3% of students liked the learning evaluation process carried out by direct question and answer between lecturers and students.

Based on the results of observations that have been made, some of the shortcomings that still occur in online learning are the lack of material explanations and references provided, the lack of learning videos in the form of direct explanations from lecturers as a complement to the material

provided in e-learning and the lack of providing feedback on student assignments. Learning that is carried out fully online has shortcomings in terms of interaction between lecturers and students and between students and students. This causes learning to be less dancing and monotonous because most of the lecturers only upload material without providing a detailed explanation of the material provided and real case studies as complementary explanations for the material are still lacking. E-learning provides discussion forum facilities as well as quiz facilities as evaluation materials, but they are still not fully utilized. Discussions on e-learning are still dominantly carried out by students without any feedback and explanations from lecturers. Technical matters such as signals are still the main obstacle in online learning that can hinder the learning process. In addition, online learning sometimes makes lecturers often change meeting schedules which can make it difficult for students to set their own schedules.

Based on the identification of the problems experienced by students during online learning, the following is a grouping of learning experiences that are mostly experienced by students. Table 2 shows the learning experience of students regarding the lecture schedule during online learning. Table 3 shows the learning experience of students related to learning materials and reference materials. Table 4 shows the learning experience of students related to learning videos. Table 5 shows the learning experience of students related to quizzes and discussion forums on e-learning. Table 6 shows the learning experience of students related to interactions in lectures. Table 7 shows the learning experience of students related to synchronous meetings via video conference. Table 8 shows the learning experience of students regarding feedback and assessment.

**Table 2. Class Schedule**

<b>Interviewees</b>	<b>Comment</b>
Dina	Class hours that sometimes change suddenly move, so sometimes we have to cancel activities that were scheduled at the beginning.
Ukki	The meeting schedule should be adjusted to the predetermined schedule.
Winda	Learning is carried out more scheduled and face-to-face learning is carried out more often so that students can carry out discussions more easily.
Diva	Please for the learning schedule to be carried out according to a predetermined schedule so that it does not change at any time.
Wawan	My suggestion is maybe the lecture time can be more precise according to the schedule.

**Table 3. Explanation of Learning Materials and Reference Materials**

<b>Interviewees</b>	<b>Comment</b>
Dwita	The problem that I experience is that it is sometimes difficult to understand the material in e-learning before seeing case studies or examples related to the material.
Arista	Tasks that are a little difficult to understand and reference material that is sometimes a little hard to come by. The limitation of getting online learning materials where when reading the material provided is sometimes difficult to understand due to the lack of available material.
Dwi	There are still some materials delivered by lecturers that are difficult for students to understand when done online.
Kusuma	From previous experience, in asynchronous learning (e-learning) some lecturers only send youtube links to explain the material at the meeting, the video does not explain how to complete a task/case but only introduces the material. Meanwhile, the lecturer in charge of the course sent an assignment so that it was difficult for us to complete the task.
Listiana	My suggestion is that in the future the lecturers will provide a lot of reference material for us.
Ayu Suputri	Lecturers are expected to provide book recommendations that are used as references in learning.

**Table 4. Learning Videos**

<b>Interviewees</b>	<b>Comment</b>
Dina	In my opinion, online learning has been running according to the needs of the students. However, it would be even better if the lecturers presented more learning videos in e-learning.
Dwita	The advice I can give is that it would be better if the material was added with videos or case studies related to the material provided to make it easier to understand the material given in e-learning.
Triarta	My suggestion for e-learning content, during asynchronous lectures, the material is given not only in the form of modules and discussions but it is also hoped that an explanation video made by the lecturer or from other sources can help students better understand the material.
Yudi	My suggestion is that lecturers might be able to fill in the material with short video content when there are no online meetings and encourage students to look for lots of references related to lecture material.
Tirana	Provide interesting e-learning content such as modified learning videos so that they are easier to understand.
Decky	Please add more e-learning content to educational videos.
Callysta	Provide learning videos from the lecturers themselves and are equipped with reading sources.

**Table 5. Quiz and Discussion Forums on E-learning**

<b>Interviewees</b>	<b>Comment</b>
Dwita	In my opinion, what is still lacking is that several lecturers have not facilitated discussion forums for students on e-learning.
Dina	The content in e-learning should be made more varied, for example, presenting video material and forums for discussion.
Yudi	I feel that there are lecturers who do not fully upload material on e-learning. What is lacking is that not all courses provide quiz sessions which for me are good for measuring students' level of understanding per material and can be evaluated and improved as soon as possible.
Ely	My advice, if possible, don't close the discussion form on e-learning because if it's closed I can't see other friends' opinions on what was discussed. For quizzes in each material, it is necessary to make an answer key after we finish answering because if there is no answer key how will we know the right answer.
Kartika	Lack of interactive discussion during learning.

**Table 6. Interaction in Lectures**

<b>Interviewees</b>	<b>Comment</b>
Callysta	What I feel is the lack of interaction between lecturers and students.
Rosila	Lack of interaction between lecturers and students due to frequent lectures asynchronously.
Mila	Lack of lively interaction and discussion in every meeting. Even though it is more influenced by the enthusiasm of students to discuss the material given by the lecturer.
Kartika	Interaction between lecturers and students during online lectures is still lacking and learning is less interactive.



**Table 7. Synchronous Meetings via Video Conference**

<b>Interviewees</b>	<b>Comment</b>
Setiari	It is necessary to hold video calls for some lecture materials which are complex and difficult for students to understand just by reading.
Dhanu	It would be better if video conferencing was done more often so that the atmosphere of the lecture was more pronounced.
Bagus	In my opinion, coming directly to campus might increase my enthusiasm for learning. However, for conditions like today, the thing that makes me excited is discussing with friends via zoom/meet.
Ayu Suputri	My suggestion is that learning by meeting needs to be done more often because if I am only given assignments without explanations it will make me less understanding of the material being discussed.

**Table 8. Feedback and Evaluation**

<b>Interviewees</b>	<b>Comment</b>
Triarta	In my opinion, the lack of online learning in the information systems study program is that in discussions in e-learning not all lecturers provide feedback or answers related to questions asked by students. Then the value of each assignment that students have collected in e-learning is also rarely shown to students.
Mila	Maybe the lecturer can add feedback in the form of grades or comments for assignments that have been made by students.
Diva	As long as online learning has been done quite well, the lack is a discussion or giving each other feedback like an offline class.
Yudi	The drawback is that there is no feedback on each submitted task.
Kartika	There needs to be feedback in the form of assessments or comments on assignments that have been made by students.

#### **4.1.3 User Persona Design**

User personas are grouped based on the characteristics of the same user group. The following are the personas of online learning users, namely Figure 2 is the persona of Dina, the 7<sup>th</sup>-semester student, Figure 3 is the persona of Dwita, the 5<sup>th</sup>-semester student, Figure 4 is the persona of Kartika, the 3<sup>rd</sup>-semester student, and Figure 5 is the persona of Ayu, the 1<sup>st</sup>-semester student.

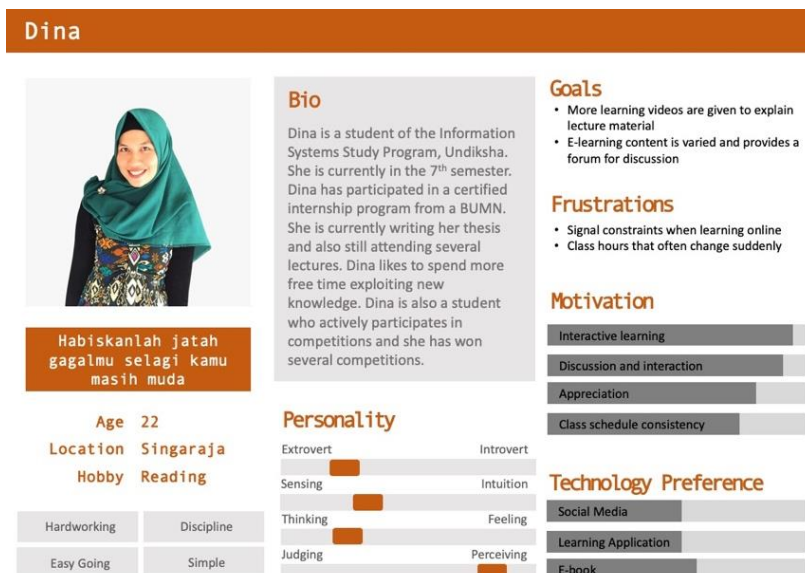


Figure 2. User Persona of 7<sup>th</sup>-Semester Student

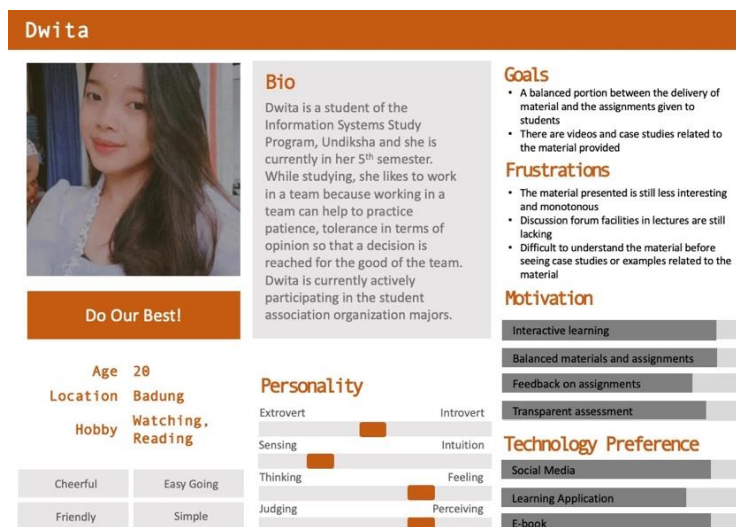


Figure 3. User Persona of 5<sup>th</sup>-Semester Student



Figure 4. User Persona of 3<sup>rd</sup>-Semester Student

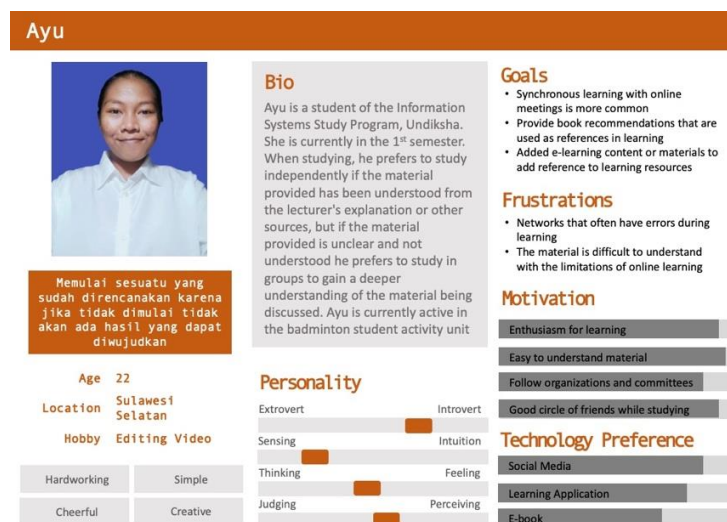


Figure 5. User Persona of 1<sup>st</sup>-Semester Student

Mapping the user into the four personas can be used to understand the problems and conditions of the user in detail. Figure 2 is Dina's persona that having goals more learning videos are given to explain lecture material and e-learning content is varied and provides a forum for discussion. Figure 3 is Dwita's persona that has goals, namely a balanced portion between the delivery of material and the assignments given to students and there are videos and case studies related to the material provided. Figure 4 is Kartika's persona that having goals, namely getting feedback in the form of grades or comments for assignments that have been made by students and directing the learning process to be more interesting and stimulate students' curiosity to learn. Figure 5 is Ayu's persona that having goals, namely synchronous learning with online meetings is more common, providing book recommendations that are used as references in learning, and adding e-learning content or materials to add a reference to learning resources.

#### 4.1.4 User Persona Analysis

Based on the results of identification through observation by distributing questionnaires and also the persona design that has been carried out, the results of the analysis of the learning experience in online learning are as follows.

1. Online lectures must be carried out according to a predetermined or mutually agreed schedule by not making changes to the schedule from time to time continuously.
2. Providing consistent material to students in e-learning and accordance with learning outcomes in the course. The provision of material can be added by providing several reference sources of learning as a reference for students in studying the topic of the material discussed.
3. Explanations related to lecture materials are not only done by providing material in the form of texts or reading books but also additional explanations in the form of learning videos to facilitate student understanding regarding the material discussed. The learning video needed is a learning video in the form of a direct explanation from the lecturer in charge of the course related to the material provided.
4. Giving quizzes and discussion forums on e-learning in each material is very necessary as an evaluation and reflection material for students regarding their understanding of the subject matter. In addition, discussion forums can be used as a medium of communication between students and lecturers or between students and students even though it is carried out asynchronously.
5. Intense interaction is also needed both synchronously and asynchronously to confirm and discuss material that is difficult or not understood by students.

6. Although learning is entirely done online, it is necessary to schedule meetings synchronously via online meet to be able to interact directly with students discussing lecture material between students and lecturers.
7. Provide assessment and feedback to students on the tasks they are doing so that students know if they make mistakes and misconceptions about the lecture material.

## **4.2 Analysis**

The analysis technique with personas has the advantage that it can explore complex and in-depth user behavior by providing an understanding of the user's personal experience, emotions, empathy, personalization, and user specifications [20]. Personas provide information regarding user needs and the decision process is focused on user needs [21]. This persona technique is used to identify and analyze the learning experience of students in the use of online learning because until now there are still many obstacles experienced in online learning that can affect the learning experience of students. Several findings from previous research related to the learning experience in online learning are research conducted by Kuong [22] stated that online learning is more flexible and allows students to get more time to reflect on the subject matter. However, there is a lack of face-to-face interaction, personal relationships, and feedback given in learning. Research conducted by Yang [23], stated several challenges in online learning, namely lack of interaction with teachers, lack of virtual classes and feeling isolated, difficulty to stay focused, preferring to study in class because they can do social interaction, technical problems such as internet connection, more difficult to work in virtual teams, communication and support from teachers which is difficult to do in online meetings, and access to facilities that cannot be enjoyed such as using the study room in the library. While research by Vargas, et. al [24] stated that several things are being considered to improve the student experience in online learning, namely assimilation of digital experiences, providing more time for reflection, and application of new knowledge assimilated in a subject through project-based learning (PBL) models and the need to produce alternative strategies to support mentoring students, taking into account their diverse learning needs and socio-cultural characteristics.

The results of the user persona analysis that have been carried out show that there are still some things that need to be improved in the online learning process to provide a better learning experience for students. Based on the results of grouping the learning experience of students in online learning, 7 important aspects need to be considered in the learning process. The first aspect is related to the lecture schedule that changes frequently. Online learning makes the teaching and learning process more flexible. However, this sometimes makes it easy for lecturers to change the meeting schedule not according to a predetermined schedule, so this makes it difficult for students to set their own schedule. The second aspect relates to the provision of inconsistent and incomplete material and reference material. If learning is carried out asynchronously through e-learning, the material provided by the lecturer is sometimes limited and incomplete, for example only providing material in the form of power points. The obstacle that is often experienced is that students may be able to understand the material, but it is not comprehensive because students understand the material based on their own interpretation or their point of view [25]. In addition, sometimes the material given is not on time according to the class schedule, making learning hampered. Students want the lecturer to provide a reference for learning resources on the topic of the material discussed so that the explanation obtained can be more complete.

The third aspect is related to learning videos that are needed by students to complete the explanation of the material in visual form. Videos and animations can make it easier for students to understand learning content related to complex concepts or theories [26]. The fourth aspect is related to quizzes and discussions on e-learning which are used as evaluation materials in learning. Students want a quiz on each material to measure their level of understanding of the material. In addition, students also want a discussion forum on e-learning so that students can exchange ideas in discussing a material topic. Evaluation and assessment play an important role in learning to align what is assessed in the course, determine what students are expected to learn and validate the student learning experience [27]. Evaluation for each lecture material can be done by giving a quiz or test at the end of the material. With assignments or quizzes, students will be more enthusiastic in learning the material because they are worried if the assignment or quiz is not completed. On the other hand, if the lecturer

provides material without any assignments or quizzes, students are not enthusiastic about learning it because there are no obligations to be completed [25]. While online discussion can facilitate student learning to be able to think critically collaboratively, articulate thoughts, negotiate meaning, and build knowledge socially [27]. The fifth aspect is related to interactions in lectures that are less interactive. This is because learning is more often done asynchronously so that students do not get an explanation of the material directly from the lecturer. The lack of diverse classroom activities is another factor that causes students to lose interest in online courses [26].

The sixth aspect relates to the need for synchronous meetings via video conference regularly. Synchronous meetings help students to interact directly with lecturers and other students and directly discuss material that is still not understood. Synchronous meetings that are held regularly can overcome misconceptions that occur in students regarding a material. Direct interaction between lecturers and students which is carried out in real-time at synchronous meetings can increase student learning motivation because students receive direct feedback from the lecturer [28]. The seventh aspect is related to feedback and assessment on assignments, exams, and tests conducted by students. Transparent feedback and assessment are needed by students as material for reflection and self-evaluation of a topic or subject matter. With clear feedback, it will be easier for students to find out the shortcomings and mistakes made on assignments, exams, and tests given by lecturers. Feedback provides insights to help students achieve learning goals and improve self-regulation skills [29].

## 5 Conclusion

Based on the results of the research conducted, the persona technique can be used to explore more detailed data related to user needs in this case is to explore the needs of students related to online learning in accordance with their wishes and expectations. The observation phase by conducting a survey was carried out to explore initial information related to the learning experience of students in conducting online learning. Based on the results of the analysis of the survey conducted, it was found that there was still a lack of interaction during learning, both interactions between students and lecturers and between students and students. In addition, there is still a lack of use of appropriate learning methods and the lack of feedback given by lecturers to students related to assignments made by students. Then students who have the same obstacles related to the learning experience in online learning are grouped and further interviews are carried out. The results of the interviews were analyzed to describe in the form of user charms by grouping users by semester, namely 7<sup>th</sup>-semester students, 5<sup>th</sup>-semester students, 3<sup>rd</sup>-semester students, and 1<sup>st</sup>-semester students.

Based on the description and analysis of personas, the results show that there are still some shortcomings and obstacles faced in online learning and several things that need to be considered for online learning in the future, namely the lectures carried out should be in accordance with a predetermined schedule, providing more reference material and explanation of the material provided. provide more detail, provide learning videos to provide additional understanding regarding lecture material, provide quizzes and discussion forums on e-learning at the end of each material, more intense interaction is needed to discuss lecture material between lecturers and students, more frequent online meetings are held to provide confirmation and discussion of the material as well as providing feedback on each task that students do.

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