

Cultural Dimensions and Intercultural User Interface Design (IUID) in a Learning Management System: Indonesian and International Student Perspectives

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Abstract. This article discusses how cultural values drive the ways students engage in a Learning Management System (LMS) and perceive its usability from the perspective of Intercultural User Interface Design (IUID). Universities around the world employ LMS as an integral part of online learning but the cultural significance of the interface design remains under debate as it is believed to be an enhancing aid for information processing and learning. Analyzing data from qualitative interviews and usability testing on Indonesian and international students in an international university in Indonesia, this article provides remarkable insights for both students and educators. Evidence shows that nationality-embedded cultural values as reflected in students' personal characteristics regulate their learning behaviors. Cultural dimensions such as individualism versus collectivism, power distance, uncertainty avoidance, and masculinity versus femininity are present in students' attitudes toward online learning. For this reason, this study suggests that the cultural values and backgrounds of LMS users need to be taken into account in designing an online learning platform.

1 Introduction

A Learning Management System (LMS) has been around in learning environments within higher education institutions, but the COVID-19 pandemic pushed universities around the world to enhance and maximize the use of it for the center of remote learning. This situation gave persistent challenges for students worldwide to adapt to new learning environments. The utilization of LMS in online learning approaches can prove to be a significant departure from what students were accustomed to in their home country, thus leading to further challenges and adaptation struggles for these individuals [1]. Whether the innate cultural values indicated in each group will influence the usage of LMS will be analyzed through the methodology of qualitative usability testing and user interviews.

International students have been the subject of prior research regarding their adaptation to online learning, with many finding it difficult to adjust to both cultural and academic means [1]. Furthermore, cultural inclusivity for international students should be strived for in LMS design, to better help them with both cultural adjustment and pride in their academic learning [2]. For this reason, educational service quality through thorough preparation of learning tools is essential to both educational satisfaction as well as long-term learning overall [3].

The discussion in this article is mainly centered around the usability of *Binusmaya*, the LMS utilized in an Indonesian university *Universitas Bina Nusantara* or

Binus. Created in 2013, *Binusmaya* was developed by *Binus* University's Digital Media Development team and was made to incorporate MCL (Multi-Channel Learning) for students on campus. The LMS serves as a one-stop center for students and lecturers as well as supporting staff to exchange information regarding lectures, examinations, internships, graduation, and others.

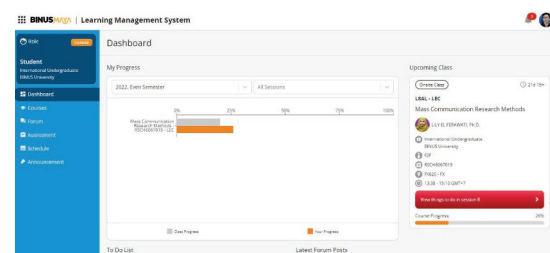


Fig. 1. *Binusmaya* Dashboard

In November 2021, an update was made to *Binusmaya* to better facilitate online learning during the COVID-19 pandemic with simplified design and clean dashboard (as seen in Figure 1). The university's self-built LMS also comes in a mobile app that provides actual reminders about lecture schedules and notifications of discussion forum entries.

Binusmaya as a learning management system utilizes English as a main language with no other language options. Though the English fluency of both international students and Indonesian students has been assessed through *Binus* University's English

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proficiency tests prior to entering. However, according to Alharbi and Smith [4], prior research has indicated that English fluency can remain a considerable factor for international students in their pursuit of higher education. To further this, Hibatullah [5] also considers that a lack of usage for English outside of educational settings could ascertain an international student's deficiency in overall education. For international students studying in Indonesia, English itself, though universally utilized on campus at *Binus*, is not utilized as often as Bahasa Indonesia. This could lead to further issues with adaptation for international students as a whole as language barriers in online learning can present obstacles for both students and lecturers with a mutual goal for satisfaction in higher education [6]. With this understanding the research aims to (a) analyze the cultural values indicated by a pre-existing LMS through user perspective, and (b) understand the possible cultural differences in usage between Indonesian and international students with an LMS.

2 Literature review

Cultural inclusivity in the implementation of a Learning Management System (LMS) becomes a central question in a higher education environment where students come from different cultural backgrounds. Current literature points out that LMS is often engineered to promote individual self-learning and self-assessment and neglects the culturally diverse backgrounds of students which leads to the digital divide [7-8]. Reviewing policies and guidelines for LMS in Australian higher education institutions, Dreamson [8] identifies that inclusive learning principles and strategies on an LMS for indigenous students remain less significant.

Yalamu [9] shows that positive feedback is apparent for an LMS that is engineered to accommodate user preference and the cultural background of students in Papua New Guinea. Engaging in positive cultural interactions through online learning has also been found to impact international students' satisfaction with their experience with higher education [3]. Though international students have been found to have more internal motivation to utilize possibly unfamiliar e-learning technology like LMS [10], Sleeman, Lang and Dakich [11] mentions that international students would prefer to use social networking sites (SNSs) instead of proper utilization of academic tools like LMS for the aspect of social interactions with their fellow peers. This shows that adaptation to current usage of LMS can be difficult for international students. Furthermore, cultural adaptation in regard to online learning in particular can prove to be difficult for international students, and possible preparation for tools like LMS should be considered greatly beforehand [1].

Studies focusing on international students regarding LMS usability and the possible cultural implications remain underrepresented. One such case by Young [12] specifies the need for usability of online platforms created by universities for international students. This study, however, focuses on the university's website in particular and not on the specific pedagogical usage of

the online materials that universities provide. This emphasizes the importance of understanding the usability of LMS and its relations to the cultural implications that international students might have towards it.

In some studies, the application of cultural dimensions in LMS appears to be a significant consideration. Tinmaz and Lee [13] state that LMS design in particular should consider Hofstede's cultural dimensions. Hofstede's six cultural dimensions framework serves to understand how cultural values embedded in nationality drive people's behaviors in various aspects of life including learning [14]. The six dimensions include power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, long-term versus short-term orientation, and indulgence versus restraint [14]. Recent studies show that cultural dimensions—especially uncertainty avoidance, collectivism, and long-term orientation—influence knowledge-sharing [15-16]. In the context of online learning, Sadykova and Meskill [17] specify the importance of understanding online learning accommodation for international students in cultural dimensions such as power distance in course design and culturally specific learning practices for online learning environments.

With that context in mind, the role of cultural dimensions has been established as playing a large role in both pedagogy and online learning, whether it be for user interface design or user experience matters. For this research, and for international students currently studying in Indonesia, there is a possibility that Indonesian cultural values are reflected in the design of the online learning in Indonesian universities. This is implied by studies [18-19], wherein design as well as online learning curriculum follows Indonesian cultural dimensions. Furthermore, Usman et al. [20] finds that current learning culture of online learning in Indonesia is prevalently affected by the cultural values adopted by the country as a whole, such as having high power distance and a high uncertainty index. Hanoum and Silvana [21] confirm this by mentioning that due to the influence of cultural values like high power distance, collectivism as well as high uncertainty avoidance, Indonesian students can face problems in online learning, and solutions through instructional needs should therefore be supplemented. Studies in regard to Indonesian LMS analysis in particular are lacking, however, which furthers the need for this research.

Aside from that, user interface design has also been found to be culturally relevant in the creation of LMS according to studies [22-25], with distinct cultural values corresponding to the design of a webpage's attributes such as uncertainty avoidance and even power distance. As a matter of fact, intercultural user interface design frameworks like IUID (Intercultural User Interface Design) encourage the prominence of these cultural values to appear in the design of pedagogical tools or websites, inciting cultural inclusivity [26]. Guidelines have already been published regarding the possible usage of a culturally inclusive website or learning management system [27]. However, regarding this concept, LMS usability must also be considered in

a cultural context as well, citing the importance of LMS being both cultural and functional in design [28]. Alexander [29] creates a guideline based on how websites from varying countries differed in web attributes and user interface design, which can correlate to positive experiences in each respective country considering which website is designed for. Significant findings show that most universities in China use Western-based design in their LMS, resulting in digital confusion among users which leads to using local websites for their online learning preference users [30-31].

3 Theoretical framework

Within Heimgärtner's research and assumption of IUID, the establishment of HCI (Human-Computer Interactions) refers to how people interact with computers as well as user systems [26]. IUID also stipulates the concepts of HCI styles, implying that the relationship between users and user systems could lead to patterns and methods of user system use that are personal in nature [34].

Thus, this relationship of how specific user patterns can interlope with the use of a system, leads to the idea and concept that Hofstede's cultural dimensions can be associated with these very same HCI styles made up of specific dimensions [26]. These dimensions (found in Table 1) correlated directly with specific indicators to better understand how to develop systems in accordance with user needs.

Table 1. HCI Dimensions and Indicators

HCI Dimension	Specifics	Indicator
Interaction frequency	Number of interactions per time unit	Mouse clicks and mouse movements
Information density	Number of information units per space unit	Number of words per message or on the display
Information/ interaction order	Sequence of appearance of information units	Number and sequence of dialog steps (e.g. number of message boxes used to indicate one system error)

Heimgärtner proposes that in prior research, these cultural interaction indicators (CII) in as part of the correlation with Hofstede's cultural dimensions to be associated with these HCI dimensions could be data-driven or hypothesis-driven as well as a mixture of both [26]. These CII are retrieved and conceptualized based on user analysis and interaction, which drives intercultural HCI research towards a more user-centric approach.

Table 2. HCI Dimensions and Indicators

HCI dimensions	Cultural interaction indicators	Characteristic of user-based	Cultural dimensions/ variables of
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		cultural interactions	cultural models
Interaction frequency	Numbers of interactions per time unit	Mouse clicks and mouse movement	Uncertainty avoidance, power distance
Information density	Number of information units per space unit	Types of messages that users pay attention to	Uncertainty avoidance
Information / interaction order	Sequence and appearance of information units	Number and specific sequence of steps users needed to complete a task	Individualism vs. collectivism, power distance

Table 2 shows how cultural interaction indicators in the case of this research are analyzed according to user analysis and the researcher's own interpretive concept of HCI dimensions. Furthermore, this study acknowledges that both qualitative and quantitative measures can be taken to analyze the cultural impact that users might have on their use of systems like LMS [36].

For this study, understanding how the cultural backgrounds of Indonesian and international students influence their usage of learning management systems is essential to the current body of literature on the topic. Furthermore, studies on the usage of concepts like IUID or any culture-centric human-computer interaction-based model on LMS. This research aims to understand to what extent both Indonesian and international students' cultural backgrounds play some role in their exploration of LMS through a usability study.

4 Method

This research investigated the individual learning preference of international students and the overall usability of the LMS known as *Binusmaya* through one-on-one semi-structured qualitative interviews, usability testing as well as an opinion-based interview from a key interviewee. The individual learning preferences referred to the correlation between Hofstede's cultural dimensions [14] and the usage of LMS. Overall usability of *Binusmaya* was analyzed according to the 'Thinking Aloud' [32] protocol for usability testing, by which users were encouraged to point out potential flaws or corrections necessary for the LMS out loud during testing.

This study involved two different groups of students studying at an international campus of an Indonesian university – *Universitas Bina Nusantara*. The first group was composed of five Indonesian students. The second was comprised of five international students of different nationalities – France, Pakistan, Jordan, and The Philippines. Both groups' opinions on the LMS were compared to understand the possibility of cultural implications in their motivations for and use of LMS. Prior to the study, consent forms were sent to willing participants and signed by them accordingly. This study was conducted through moderated Zoom interviews,

wherein participants joined with their own accounts throughout March of 2023. Participants were requested to turn on their cameras during the usability testing phase of the research. Interview transcripts as well as video recordings of the session were then produced for data analysis.

The data obtained from the interviews were analyzed through the approach of thematic analysis [33]. The discussion of the findings revolves around two main themes: Cultural dimensions in e-learning and personal take on IUID usability. In the discussion, the participants are addressed as Indonesian-1, Indonesian-2, Indonesian-3, and onwards while the international students are coded as International-1, International-2, and so on. The data from the key interviewee was analyzed accordingly and summarized according to feedback that best fit the topic of this study.

5 Results and discussion

The results of the study are discussed around the thesis of cultural dimensions in online learning and culturally influenced Human Computer Interactions (HCI).

5.1 Cultural dimensions in online learning

This study believes that cultural dimensions play a significant role in the ways students engage in online learning, particularly in the use of a Learning Management System (LMS). Referring to Hofstede's six cultural dimensions [14], this study suggests that nationality-embedded cultural values as reflected in students' personal characteristics regulate their learning behaviors. Evidence from qualitative interviews and usability testing shows that individualism versus collectivism, power distance, uncertainty avoidance, and masculinity versus femininity are present in their attitudes toward online learning. These findings correspond to previous studies which point out the significance of cultural dimension in understanding information and knowledge sharing in the age of technology [13-17].

5.1.1 Individualism and collectivism

This cultural dimension implies the extent to which members of a society are incorporated into groups [14]. Most of the Indonesian students under study showed some form of collectivistic behavior, as seen in how content they were with the current information found on the LMS. Furthermore, some also entertained the concept of a discussion forum that seeks to increase collaboration among students. Statements from the informants below are the proof.

"It depends on the lecturer as well, like the material is mostly dependent on the lecturer. They have PowerPoints, and whatnot as well and I think that it's pretty sufficient for me" (Indonesian 2).

"Everybody has a different opinion, and information, and getting better perspective can really help for a better understanding. So yeah, I prefer to have

a lot of information and to understand it which a proper discussion could help" (Indonesian 3).

For the international students, it was found that they indicated more collectivistic behavior through their preference for discussion on forums and the adequate amount of information currently accessed through the LMS. Two international students have their opinion on this.

"For what I use currently, I believe that it (the discussion forum) is enough for the time being" (International 1).

"I think it's actually very, very useful, only because if you're genuinely interested in the subject that the lecture is trying to teach you, right, then having a discussion forum allows you to delve deeper into something productive" (International 3).

However, some of the Indonesian students were found to exhibit a form of individualistic behavior from their learning preferences on an LMS. This is indicated in their preference for self-study as well as moving away from collaborating and discussing with others in forum discussions. The evidence is presented below.

"I think I need more [research]. And that's why I do much more research, rather than just relying on *Binus* themselves, I guess" (Indonesian 1).

"As a whole, educational material and educational learning in forums I find a bit awkward. Because I find that just from holding discussions with people, I would be afraid to have some terrible opinion out there on the forums" (Indonesian 3).

5.1.2 Power distance

This cultural dimension explores the degree to which a society accepts unequal power distribution amongst people [14]. For the Indonesian students, it was indicated that they display high power distance behaviors from their negative reaction to peer evaluation and the care they take when contacting their lecturers regarding missing material, such as considering a polite time of day and medium of communication. This is shown from their statements:

"I think that it's quite flawed. Because it really depends on the person's empathy and how they view their groupmates" (Indonesian-3).

"Depending on the time, like, maybe if it's at night, I would just wait until tomorrow morning or sometime then. But if it's still reasonable to contact them at that time then it should be okay to do so" (Indonesian-2).

However, some do find that power distance might not play a part in how they communicate with lecturers, highlighting the student-lecturer relationship as a factor, and possibly exhibiting lower power distance compared to the other Indonesian students. As one of the informants stated:

"In most cases I would ask my lecturer directly. In my experience, my lecturers are quite responsive" (Indonesian 4).

The international students exhibit high power distance by deciding that peer evaluation was a negative concept and cited conflict as a major factor to cause problems in rating. Some international students also considered mediums considered polite like emails

before contacting lecturers, showing high power distance as well. The informants expressed their opinions below.

"I really don't believe in it at all. Because imagine if there's any drama. Usually, if you're in a group, there's usually someone who's not doing much. It could honestly affect how you would view that person. And if it's anonymized, they might use that against you" (International 3).

"I would usually wait for at least a day. If I notice that it's still not there, I usually would like email them already, like, hey, can I get like the PowerPoint from like this session?" (International 5).

However, some international students also mentioned that they would also prefer to just contact the lecturer directly instead of simply waiting for the missing lecture material to be uploaded, exhibiting some form of lower power distance behavior. As an informant stated,

"Me personally, I would be the kind of person to message the lecturer, but I definitely want a response too from the lecturer, you know?" (International 2).

5.1.3 Uncertainty avoidance

Uncertainty avoidance refers to the cultural dimension for the tolerance of structured and unstructured situations [14]. For Indonesian students, it was found that they exhibited high uncertainty avoidance in how they prioritize efficiency in the foundation of good structure in the LMS for a better education. One informant stated,

"Yeah, it will help me to learn better cause if the structure is proper, I guess I can learn in a much more effective way and much more efficient" (Indonesian-1).

However, they found no large difficulty in adapting to even using an LMS, despite most of them never having accessed one. This shows low uncertainty avoidance behavior correlated to their acceptance of technology. A comment was as follows,

"As for adapting to *Binusmaya*, for me, it was not that difficult. Like, *Binusmaya* is just straightforward and easy" (Indonesian-2).

For the international students it was indicated that they displayed high uncertainty avoidance. This was evident in their need for specific types of information such as how specific features need to be implemented, and the specific information not found in lecture material, and their priority on structure for efficiency. One informant mentioned,

"I feel like yes this can affect my education because the less time you spend on looking what you want on the app is more time spent on doing work" (International-1).

Likewise, another informant also stated,

"But if I want to search for something, I'm usually thinking about like the topic, I'd rather it be more explicit, like using a search button for something like that." (International-3).

International students on the other hand, only some have reported that adaptation to using '*Binusmaya*' as an LMS was not difficult, though this could be due to their exposure to LMS usage prior to '*Binusmaya*' or how

they view the LMS design as universal. An informant stated,

"I feel like I didn't have to culturally adapt per se because the way it's formatted is very universal" (International-4).

On the other hand, some international students feel that it was difficult because of their prior exposure to their LMS from their home countries. To illustrate this, another expressed,

"Well, I was using my previous school's app for a long time, so for sure I had to change the way I utilized LMS to adapt to *Binusmaya*" (International-2).

5.1.4 Masculinity and femininity

Masculinity and Femininity refer to the extent to which a society differentiates the roles between men and women. In this study's context, it is used to understand the prioritization of usability and aesthetics between cultures respectively [22].

For Indonesian students, more of them were concerned with the design of the LMS, citing reputation of the university being reflected in possible professional-quality design as a common factor. One informant mentioned,

"It's very important because in terms of reputation right, you want to be able to show your students that your website has the specific quality standards that it is kept up to" (Indonesian-3).

However, some of them would rather prioritize usability or have a neutral opinion on the matter of design. One specific informant stated,

"I don't have any critiques for the design, and that it works well. Maybe I am indifferent, but I don't think it matters that much overall" (Indonesian-4).

For international students, it was found that most of them prioritized the concept of good visual design and aesthetics, citing that good visual design would be a necessary stimulus and motivation to use the LMS for their studies as a common factor, exhibiting femininity as a cultural dimension. One informant stated,

"It really is on the stimulus like, it really needs to be designed to be welcoming for students and not as if, like, you're accessing like, a boring Google Drive to access your lectures" (International-5).

On the other hand, some international students prioritized usability more than the visual aspect of the LMS, showing behaviors suggesting masculinity. As an informant stated,

"I mean personally, I never look too closely at the design. Because if an app is easy to use that's what's most important" (International-2).

5.2 Culturally influenced HCI

This study argues that cultural inclusivity in the implementation of a Learning Management System (LMS) becomes a central question in a higher education environment where students come from diverse cultural backgrounds. Previous studies have shown that most universities around the world use an LMS that is designed to promote individual self-learning and self-

assessment with a Western-like design and neglects the culturally diverse backgrounds of students which leads to the digital divide [30-31] [7-8].

For this reason, this study proposes that the cultural values and background of LMS users need to be considered in designing an online learning platform. This can be done by acknowledging students' culturally driven personal insights on the usability of the Intercultural User Interface Design (IUID) of the online learning platform. The framework of IUID encourages the prominence of these cultural values to appear in the design of a learning platform [26], making it possible to construct a culturally inclusive learning management system [28]. Results from the usability testing in particular show that IUID of LMS would be optimal by considering students' culturally influenced personal take on its usefulness and features. These are also backed by their relation to Hofstede's cultural dimensions, which similarly acts as a framework for culturally charged opinions regarding the use of *Binusmaya*.

To begin, HCI dimensions as a concept needs to be considered beforehand. This concept acknowledges that HCI for different users can be shown in a way that is representative of the user's HCI style of sorts. This is acknowledged by understanding how users process information as well as how they interact with different elements during user system interactions (in this case through *Binusmaya*) [34-35].

5.2.1 Uncertainty avoidance and power distance in interface design for interaction frequency

Hofstede's cultural dimensions recognized one dimension - uncertainty avoidance as an intercultural attribute which differs from country to country. Uncertainty avoidance index (UAI) refers to the degree of how comfortable members of a culture are with being in an uncertain or unknown situation. Power distance index (PDI) refers to the degree to which members of a culture are accepting of an unequal relationship with authority.

When referring to interaction frequency, higher UAI is culturally indicated by using more clicks to access the same information on the LMS, due to their caution for unstructured content and desire to do the task correctly [26]. On the other hand, users exhibiting high PDI will take more clicks to access the same content, due to the possible symbolism between hierarchical organization of data and hierarchies in society [26].

When asked to access lecture material in the LMS through tasks, findings indicated in Table 3 showed that UAI in the context of interaction design indicated that Indonesian students in particular had a higher average number of mouse clicks and mouse movements to access information on *Binusmaya* compared to most international students. This indicates that international students have a high UAI due to their lower number of mouse movements and clicks and vice versa for Indonesian students.

Table 3. Interaction Frequency Avg.

Group of participants	Avg. mouse clicks	Avg. mouse movement
International students	1.4	1.2
Indonesian students	3.8	3.8

Table 3 further showed that for PDI in the context of interaction design, Indonesian students exhibit behaviors with high PDI due to their high number of mouse clicks and movements and vice versa for international students.

5.2.2 Uncertainty avoidance in interface design for information density

For Hofstede's cultural dimensions, one dimension was recognized for information density. It was found that uncertainty avoidance (UAI) was a cultural dimension that were exhibited in these findings.

When considering information density, UAI is culturally indicated by the type of message that participants are more likely to pay attention to. For example, users that pay attention to messages like instructions or error notifications on the LMS, can be found to have a higher UAI due to their predisposition to unfamiliar circumstances, and thus, will be more likely to be cautious before proceeding with tasks.

Through usability testing in participants on *Binusmaya*, the findings mention that for international students, they were found to read through specific messages like instructions compared to Indonesian students. For example, when given the task to look for where to upload assignments, international students mentioned that most often they would read through course material before considering where to upload. This suggests that international students are more careful in utilizing before accessing materials on *Binusmaya*.

5.2.3 Power distance and individualism vs. collectivism in interface design for information/interaction Order

For Hofstede's cultural dimensions, three dimensions are recognized for information/interaction order. It was found that specifically - power distance (PDI) and individualism vs. collectivism (IDV) were cultural dimensions that were exhibited in these findings. Individualism v. collectivism (IDV) refers to the degree that a member of a culture would be more task-oriented (Individualism) and relationship-oriented (Collectivism).

When considering information/interaction order, PDI is culturally identified by the extent users would utilize aid from superiors present from outside of the LMS, such as asking for help from lecturers.

A user exhibiting high PDI would refer to the sequences taken and consider outside help to complete tasks found on the LMS. Finally, IDV can determine through the number of sequences whether the user is more task-oriented. A lower number of sequences utilized to access information could refer to a focus on a

more ‘straightforward’ approach to accessing content, and thus, a stronger focus on being task-oriented.

In the results of the usability testing, findings indicate that both groups of students were more likely to exhibit high PDI due to their dependency on outside help to complete specific tasks. Examples include how students mentioned the need for contacting lecturers to submit tasks instead of utilizing the assessment page found on *Binusmaya*.

Furthermore, students also remarked how when in the case for searching for help on the website in their tasked scenario, they mentioned they would rather contact lecturers on the matter than consider the current user path to look for a help and support website.

However, something to consider is how international students found that the help and support website on *Binusmaya* was written in Indonesian, a language that most were not fluent in, and thus, this could have an impact on their reliance on help outside of the LMS.

Table 4. Interaction/Information Order Sequences Avg.

Group of participant	Avg. number of sequences
International Students	3
Indonesian Students	5

Finally, as shown in Table 4, the number of sequences in order to complete a task in international students is lower than Indonesian students. This indicates a high IDV in particularly international students for choosing a user path with the lowest number of sequences. This shows that international students are more task-oriented and consider the most straightforward sequences necessary in order to complete a task.

5.2.4 HCI dimensions and culture

The relationship between cultural implications and HCI dimensions in this paper is based on the user perspective of interface design. As the cultural indicators that influence the relationship between the two are dependent on user analysis in particular, user perspective in these HCI dimensions is part of the driving force when considering designing for intercultural user systems [26]. Heimgärtner [37] states that the connection between culture and HCI dimension can be found within the cultural interaction indicators, which can be represented in HCI dimensions and correlated with another cultural framework - Hofstede’s cultural dimensions.

The cultural interaction indicators (CII) are based on data-driven, or hypothesis driven knowledge, and thus can be inferred from common conceptions regarding how specific cultural differences affect the use of user systems. An example of this was how Heimgärtner hypothesized that for more relationship-oriented countries, all three HCI dimensions would be higher compared to countries that are task-oriented [26].

To understand the possible cultural differences through culturally influenced HCI frameworks in

utilizing *Binusmaya*, this study compared the two participant groups according to the 3 cultural HCI identifiers mentioned before - information frequency, information density & information/interaction order to see the possible cultural differences according to the IUID framework.

5.2.5 Key interviewee opinion on cultural HCI and *Binusmaya*

To also understand the main relationship better between the use of cultural HCI styles and user experience in the LMS tested in this research - *Binusmaya*, this research employed the key interviewee opinion of a Computer Science lecturer that is an expert on HCI and their understandings of the concept of culturally influenced HCI. It was found that in the interview, the lecturer mentions how specifically for *Binusmaya* that it is a formative LMS still undergoing development while in use for *Binus* University, so features on the LMS are prone to stop working or not meet current user needs.

When regarding the design and user experience in the LMS, the lecturer mentions how particularly, the current user paths found on *Binusmaya* are not straightforward and can even be confusing at times. The lecturer specifically cited the dashboard as having confusing features like the ‘Progress Bar’, which he reckoned could be placed in another section instead of taking the space at the very top (the area where users would immediately look towards), which should be priority for other features like upcoming classes or recent assignments.

Furthermore, *Binusmaya*’s help and support page in particular was cited as especially conflicting with having both Indonesian and English, and particularly cited as discouraging international students when trying to adapt to the use of LMS. Due to this, the lecturer notes that students tend to come to him for help instead when facing a problem with the LMS.

When regarding concepts like culture and HCI dimensions, the lecturer mentioned how international students that come from cultures with lower technology acceptance rate could have more difficulty in adapting to the use of *Binusmaya*, and thus a higher uncertainty avoidance.

On a final note, it was noted that for the sake of inclusivity in designing platforms like an LMS, the lecturer noted that though the idea of culturally significant HCI guidelines should be considered for improvement and accommodation of international students, no user system is completely perfect, and since *Binusmaya* is still in development, there is room for improvement.

6 Conclusion

This study found that different cultural backgrounds could have some impact on how different users utilize LMS for their own learning preferences. Furthermore, international students had both similarities and differences with the Indonesian students in their use of learning tools on an LMS, indicating how cultural

backgrounds can sometimes intersect with specific learning preferences, but some might remain individual such as how Indonesians here displayed behaviors of low power distance despite prior research stating otherwise [20-21].

The objective of this study was to understand the relationship between international students and Indonesian students' cultural values and the usability of learning management systems. Intercultural user interface design (IUID) focuses on how two or more cultures interact with human-computer interactions (HCI), which in this study puts an emphasis on the use of learning management systems [38]. Furthermore, this study analyzes how specific user insight can also lead to better user experiences for LMS creation, and also to regard inclusivity as a major factor to be considered when concerning diverse groups of students.

Though the impact of culture on LMS usage can be implied based on user interactions, the current data cannot fully rectify this assumption. Within the context of this research, findings were based on different informant opinions and specific research interpretations. Thus, cultural differences between the two groups within the usage of LMS are not conclusive and are not representative of both populations of Indonesian and international students at *Binus*.

Regarding the usability of *Binusmaya* as an LMS. It was found that both international and Indonesians came to the same conclusions regarding what they regarded as useful – such as the scheduling, forums and lecture materials. However, they also found different issues with the LMS as indicated in the themes 'redundancy', 'lack of features' and 'difficulty in finding help'. Based on this feedback, here are some recommendations for improvement:

- Unnecessary features like the 'progress bar' should not be included to avoid confusion.
- Enable a clearer way to send feedback so that certain features can be recommended easier.
- Ensure that the path to request help and support is accessible for students.
- Conduct regular usability testing with students and faculty to analyze the usability of specific features on *Binusmaya* (assessments, scheduling, etc.)

To address the limitation of the study, future work should consider a quantitative approach to gather more opinions on the matter. Perhaps further research could consider a wider sample of the population, involving the whole university or different universities for comparison. As this is a qualitative study, the findings discussed in this article simply represent the specific case and participants of the study and they are not meant for generalization.

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