



COMPARING ENGLISH STUDENTS' OPEN THINKING SKILL: DISTANCE LEARNING VS FACE-TO-FACE CAMPUSES

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Dewi Wardah Mazidatur Rohmah

Universitas Terbuka

dewi.rohmah@ecampus.ut.ac.id

Muhammad Dhika Arif Rizqon

Pusat Pengembangan Bahasa (P2B) UINSA

Surabaya

dhikaibi@outlook.com

Abstract: In the context of the Industrial Revolution,4.0, where the rise of hoaxes, AI, and disruptive information is inevitable, applying Open Thinking (OT) for English students can be instrumental in fostering critical literacy and responsible engagement with information. However, which students have this skill, and what is their current level? This present study examines to what extent the English students' OT levels at Distance Learning (DL) University and Face-to-Face (F2F) University are significantly different. We apply mixed-method in this study. To obtain quantitative data, The Open Thinking Scale (OTS) is administered to more than 600 students at various academic levels (from undergraduate to postgraduate freshmen) across several campuses, including Universitas Terbuka (UT), Universitas Negeri Surabaya (Unesa), and Universitas Islam Negeri Sunan Ampel (UINSA) Surabaya. Meanwhile, the qualitative data are gathered by using semi-structured interview. The analysis reported that, in general, DL students have a higher OT score than F2F students. However, in the context of Openness to Change, F2F students have a higher mean score. Both DL and F2F students attained a moderate level of OT, although they exhibit more differences (e.g.: age, learning modes) than similarity.

Keywords: English students; open thinking; distance learning, face to face, open education

Abstrak Dalam konteks Revolusi Industri 4.0, di mana munculnya hoaks, AI, dan informasi yang mengganggu tidak dapat dihindari, penerapan Berpikir Terbuka (BT) untuk mahasiswa bahasa Inggris dapat berperan penting dalam mendorong literasi kritis dan keterlibatan yang bertanggung jawab dengan informasi. Namun, mahasiswa mana yang memiliki keterampilan ini, dan bagaimana tingkat kemampuan mereka saat ini? Penelitian ini mencari tahu sejauh mana tingkat OT mahasiswa bahasa Inggris di Universitas Pembelajaran Jarak Jauh (PJJ) dan Universitas Tatap Muka (TM) berbeda secara signifikan. Kami mengaplikasikan metode campuran di studi ini. Untuk memperoleh data kuantitatif, Open Thinking Scale (OTS) diberikan kepada lebih dari 600 mahasiswa di berbagai tingkat akademis (dari mahasiswa sarjana hingga pascasarjana) di beberapa kampus, termasuk Universitas Terbuka (UT), Universitas Negeri Surabaya (Unesa), dan Universitas Islam Negeri Sunan Ampel (UINSA) Surabaya. Sementara itu, data kualitatif dikumpulkan dengan menggunakan wawancara semi-terstruktur. Hasil analisis menunjukkan bahwa, secara umum, mahasiswa PJJ memiliki OT yang lebih tinggi daripada mahasiswa TM. Namun, dalam konteks Keterbukaan terhadap Perubahan, mahasiswa TM memiliki nilai rata-rata yang lebih tinggi. Baik mahasiswa PJJ maupun



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mahasiswa TM memiliki tingkat OT yang moderat, meskipun mereka menunjukkan lebih banyak perbedaan (contohnya: usia, moda pembelajaran) daripada persamaan. (program studi)

Keywords: *mahasiswa bahasa Inggris; berpikir terbuka; pembelajaran jarak jauh, pembelajaran tatap muka, pendidikan terbuka*

INTRODUCTION

Openness has various benefits depending on the context in which this idea is being discussed. In the context of higher education, openness promotes a more democratic and competitive system, with the potential to increase access to education, develop and localize open education services that fit local contexts, and enhance the integration of education into everyday life as part of lifelong learning (UNESCO 2014). This kind of openness provides more opportunities for every learner to gain valuable knowledge and learning experiences, even if they are faced with some limitations (geography, race, ethnicity, funds, time, etc.). Indeed, achieving this ideal is not easy, and there is still a long way to go.

Inspired by this ideal, the question arises: 'Where and how do we start this kind of openness? Openness is not something that comes out of nowhere. Just like idealism, openness is a seed that is planted in a person's mind so that the person has the ability to think openly

The notion of Open Thinking (OT) is relatively new. Bozkurt, Kaseoglu, and Singh (2019) believe that there is no agreement on the definition of OT due to its diversity. In the same vein, the notion of Active Open Thinking (AOT) is widely used in extensive studies (Haran, Ritov et al. 2013; Svedholm-Häkkinen and Lindeman 2017; Metz, Baelen et al. 2020; Al-Askar and Rashid 2021; Al-Hassan and Ghudaib 2022).

For this study, the notion of OT we used is highly influenced by Jonathan Baron's research on AOT for the last 20 years. Baron and his colleagues (Baron, 1993, 2003, 2012, 2019; Baron, Isler, & Yilmaz, 2023) continuously proposed that AOT emphasizes two ideas: Rationality and Intelligence (RI) and Thinking and Deciding (TD). In the digital age, where disturbing information is unavoidable, OT becomes an antidote that can

protect us from hoaxes and maintain our sanity. This implies that OT should be taught to DL students, as these students are expected to achieve a higher level of independence compared to F2F students. A number of literatures (Singh and Panigrahi 2018; Baron 2019; Metz, Baelen et al. 2020) mentioned several features of OT. These include being an indicator of an individual's level of rationality in making decisions and avoiding bias, the ability to estimate one's own level of knowledge (metacognitive), improving critical thinking and problem-solving skills, and serving as an antidote to negative information (e.g., hoaxes, hate speech, etc.).

In their recent study, Jung and Lee (2022) offered six components that shape OT. First, openness to change discusses how an individual is influenced or influences the environment around them. This environment can include family, campus, online, etc. Second, openness to cultural diversity involves an understanding of their cultural identity and an awareness of other cultures they have experienced or heard of. Third, openness to sharing explains awareness of rights and obligations, what is owned, and what is gained. Fourth, openness to new learning reveals the variety of learning sources available and the desire to be able to use them. Fifth, openness to collaboration explains behavior as both individual creatures and social creatures to achieve a specific goal. Lastly, openness to various perspectives discusses the viewpoints or opinions or beliefs held and the response to events around them. At first glance, the concept of Jung and Lee (2022) is more applicable and concrete than Baron's (1993) concept when applied to behavioral analysis. Baron's first (1993) and second (Baron 2019) concepts are more focused on the aspects and processes of (meta)cognition that occur before taking action or behavior.

OT holds substantial significance for students specializing in English; either they are majoring in English Education, English Literature, Translation Studies, Linguistics, or others. By nurturing OT, these students can encourage critical thinking skills, enhancing their ability to analyze and interpret complex texts, literary works, and language structures. This fosters a deeper understanding of cultural diversity and various perspectives,

enabling them to become more effective educators and proficient language scholars. Additionally, OT equips students with the adaptability and problem-solving awareness necessary to navigate the evolving landscape of language studies and education, preparing them for successful careers as educators, researchers, or language professionals in an increasingly globalized world. At the end, as a future language scholar, the student will dynamically and continuously blend and cross different fields by applying OT (Nashruddin and Mustaqimah, 2020).

It is argued that OT is a key learning outcome of Open Educational Practice (OEP), and these skills are necessary for decision-making about what to do and judgment about what to believe (Metz, Baelen et al. 2020; Jung and Lee 2022). Of the thousands of campuses in Indonesia, UT is the only campus that implements OEP and distance learning (DL) system. This is an advantage that UT has compared to other campuses that only implement the face-to-face (F2F) system. Since the COVID-19 pandemic, several campuses (other than UT) have implemented online-based learning. However, we need to know that online-based learning is actually not much different from the F2F system because the difference lies only in the media or virtual space for delivering material that provides opportunities for students and lecturers not to be physically present in one place but still at the same time. This type of learning is often referred to as (online) synchronous. In contrast, the DL system is more likely to be called asynchronous because students are prepared to learn independently whenever they want, with or even with minimal guidance from lecturers. From these two different learning systems, it is natural that OT is considered as an outcome that must be possessed by DL students (Jung and Lee 2022). However, this does not mean that OT is not important for F2F students.

OT is important for students in Indonesia due to Indonesia's ethnic and geographical diversity. Although data on the distribution of students by ethnicity has never been confirmed, DL and F2F campuses enroll diverse students from almost every province in Indonesia, spanning from west to

east. Maintaining this diversity is a challenge, especially when these students are geographically separated by oceans. This challenge reminds us that these students need soft skills to freely socialize with students from other ethnicities without being judged. Therefore, OT is one of the most crucial skills for both DL and F2F students, as it can bridge social and academic interactions—both virtually and in reality—among students from different provinces. Indeed, this type of interaction can be achieved when students acquire a certain level of OT.

Studies on the relationship between OT and several variables show mixed results. The high level of OT is influenced by the high exposure of EOP to hundreds of adult learners from 24 countries across continents (Jung and Lee 2022). In fact, another study confirmed that high levels of OT can also be possessed by adolescent learners (Metz, Baelen et al. 2020). Regarding gender (male and female), the results are still debated. On one hand, a study conducted by Al-Hassan and Ghudaib (2022) revealed a difference in OT according to gender, with female scores being higher than male scores. Their study used university students in Iraq as participants. On the other hand, a study by Al-Ashkar and Rashid (2021) found no significant difference based on gender, and this study recruited Finnish adults as participants. Although various results have been confirmed, a study comparing OT levels of students in distance learning and F2F campuses is not yet available in the literature. This study aims to contribute to filling the research gap in this area.

Unfortunately, research on the comparison and the inter-correlation among OT elements are limited, particularly when it compares the students' OT between F2F university and DL university. Given this gap, this study aims to address the following questions: 1) To what extent does the level of OT ability differ between DL English students and F2F English students? And 2) Is there a positive correlation among OT Elements?

METHOD

Design

We applied a mixed-method approach in this research. In this method, the results of quantitative analysis were more dominant than the results of qualitative analysis, in accordance with one of the classifications of quantitative-qualitative research varieties by Bryman (2012).

To provide broader generalization to DL and F2F campuses in East Java, we recruited more than 600 English students as respondents from Universitas Terbuka (UT), Universitas Negeri Surabaya (Unesa), Universitas Islam Negeri Sunan Ampel (UINSA) Surabaya. Most of them are majoring in English Education while only small number of them are majoring in English Literature. A total of 336 (56% of the initial target) respondents completed the questionnaire, and 21 of them agreed to be interviewed.

For the purpose of this study, the students were divided into two groups based on their learning systems: DL students (which contains UT's students) and F2F students (which contains the students of Unesa, and UINSA). Table 1 covers three main aspects: gender, study program, and student age. In terms of gender, the study included 192 DL students, with a majority being women (163 students) and a smaller number being men (29 students). Regarding the study program, all 192 students are enrolled in the Education Science program, with no representation from Non-Education Science programs. Finally, in terms of the age of the students, there was a diverse range of age groups. The majority of students were between 20 and 30 years old (103 students), followed by those under 20 years old (25 students), those aged 31-40 years old (44 students), and those over 41 years old (20 students).

Table 1. Demographic of DL's Students

Gender	Quantity	Female	Male	Total
	n	163	29	192
	%	84	16	100
Study Program		English Education	English Literature	
	n	192	0	192
	%	100	0	100

Age		<20	20-30	31-40	41<	
	n	25	103	44	20	192
	%	13	54	23	10	100

In Table 2, the distribution of students by gender reveals that there are 144 students on the F2F campus who were subjects of the study. The majority of them are female, comprising 124 students, while the number of male students is smaller, only 20. As for study programs, the majority of students are pursuing programs in the field of Education Science (142 students), with only a few representing Non-Education Science study programs (2 students). In terms of age, there are two main groups: those who are less than 20 years old (101 students) and those aged between 20 and 30 years old (43 students).

Table 2. Demographic of F2F's Students

Gender		Female	Male	Total
	n	124	20	144
	%	86	14	100
Study program		English Education	English Literature	
	n	142	2	144
	%	99	1	100
Age		<20	20-30	
	n	101	43	144
	%	70	30	100

Data collection

Two instruments were used in this study: questionnaires and interviews. First, for quantitative data collection, Jung and Lee's (2022) OTS was adapted to meet the research objectives. The questionnaire consists of 27 statements covering six Elements of openness. First, 'Openness to Change' explores how an individual is influenced by and impacts their environment, which can encompass various contexts such as family, campus, and online interactions. Second, 'Openness to Cultural Diversity' involves an understanding of one's cultural identity and an awareness of other cultures they have encountered or learned about. Third, 'Openness to Sharing' pertains to awareness of rights and obligations, distinguishing what is owned from what is acquired. Fourth, 'Openness to New Learning'

encompasses the recognition of diverse learning resources and a desire to utilize them effectively. Fifth, 'Openness to Collaboration' examines an individual's behavior as both an independent and social entity, working toward a common goal. Finally, 'Openness to Various Perspectives' involves considering different viewpoints, opinions, and beliefs and responding to events in one's surroundings.

This study used a 5-point Likert scale (from 1= strongly disagree to 5= strongly agree). The OTS used a 5-point Likert scale (from 1= no understanding to 5= advanced level of understanding). There are two reasons why we decided to implement this questionnaire. First, OTS is considered a relatively new instrument that requires more empirical use in diverse contexts and with different target groups. Second, the reliability score of this scale was quite high (0.982). To facilitate the completion process, this questionnaire was created and circulated online to respondents' emails. Some demographic questions, such as gender, campus origin, age, and study program, were included to collect their personal information. Secondly, for qualitative data collection, we will conduct semi-structured interviews. The questions in the interview session aim to provide respondents with the opportunity to confirm, explain, and explore the background of their answer choices in the OTS. These interviews will be conducted face-to-face to elicit more reliable and robust data

Data analysis

To conduct quantitative analysis, SPSS was used to measure the mean, standard deviation (SD), and inter-factor correlation (r) between OT Elements. OT levels were classified as shown in the table below. Each Element of the scale is worth a maximum of 10, and the maximum total value of the scale is 60. The frequency, percentage, arithmetic mean, and standard deviation values of the data collected from students through the scale were analyzed in SPSS. The relationship between the OT Elements was measured using Pearson's correlation coefficient, which ranges from -

1 to 1 and is used to measure the strength and direction of the relationship between two Elements.

Structural equation modelling was used to determine the extent to which the variables predicted their OT. The analysis was based on p levels ≤ 0.5 and $\leq .01$. Table 3 illustrates the conversion of OT scores and levels in this study, which have been grouped into three categories. There are three OT groups: the low group, the average group, and the high group. The low group includes levels L1 to L3, with a score range between 0 and 30, indicating a low level of OT understanding. The average group consists of L4 levels with scores between 31 and 40, reflecting an average level of OT comprehension. Meanwhile, the high group includes levels L5 and L6, with a score range between 41 and 60, indicating a high level of OT. This grouping will be used to measure students' OT ability in this study.

On the other hand, as elaborated by Ary, Jacobs et al. (2014), qualitative analysis is divided into three stages: familiarizing and organizing, coding and reducing, and interpreting and representing. First, we will transcribe the interviews and read them several times until we are familiar with and understand the meaning the respondents want to convey. The transcriptions were then marked, coded, or annotated with interpretations and stored neatly in a password-protected cloud storage. Secondly, the codes and notes on the transcriptions were grouped to provide more general themes/topics. Non-repeatable or unreliable data were separated to avoid mixing with the analyzed data. Third, the inductively developed themes/topics were presented and interpreted according to the interview excerpts. The results of the qualitative analysis combined with the results of the quantitative analysis to deepen the interpretation in the discussion section.

Since the research applied mixed methods, we will also have triangulated the data, participants, and instruments to make the qualitative analysis results more reliable. First, the questions of the semi-structured interviews tested on other respondents to ensure the accuracy of answers and the themes/codes used in the inductive analysis process. Second,

member checks or confirmation of the accuracy and consistency of respondents' answers conducted twice: first during the interview process and then after the interview transcript had been completed and returned to the respondent. This is to ascertain which parts of the transcript need to be omitted.

RESULTS AND DISCUSSIONS

The Comparison of Open Thinking Level between DL's Students and F2F's Students

- Null Hypothesis (H0): There is no significant difference in the mean OT ability between students in the DL campus and the F2F campus.
- Alternative Hypothesis (H1): There is significant difference in the mean OT ability between students in the DL campus and the F2F campus.

In the analysis results presented in Table 4, it can be observed that the average Open Thinking (OT) ability of Distance Learning Campus (DL) students is 36.8, whereas Face-to-Face (F2F) students have an average OT score of 34.5. This indicated an apparent difference in the mean OT between these two groups. However, upon examination of the statistical values, it is found that the t-value is 0.81 with a p-value of 0.416. The fact that the p-value is greater than the significance level of $\alpha = 0.05$ suggests that this difference is not statistically significant. These findings imply that the DL campus has effectively nurtured the OT of its students. These results align with Jung and Lee's (2022) study, reinforcing the importance of OT as a key learning outcome in OEP.

Tabel 4. General Comparison of Open Thinking between DL's students and F2F's students

Variable	DL students	F2F students
Mean OT	36.8	34.5
Standard Deviation		
OT	4.2	5.1
N	192	144
t value	0.81	
p value	0.416	

The mean OT Element scores ranged from 34.5 to 42.1, indicating a moderate level of variation, with p-values ranging from 0.035 to 0.416. In Table 5, data regarding the comparison of OT ability between DL and F2F

students based on the "Openness to Diversity and Inclusion" Element reveal interesting differences. The analysis showed that DL students have a higher average ability, with a mean OT score of 42.1, while F2F students have a mean OT score of 39.7. The Standard Deviation for both groups showed relatively similar levels of variability in OT ability.

Table 5. Comparison of Openness to Diversity and Inclusion between DL's students and F2F's students

Variable	DL students	F2F students
Mean "Openness to Diversity and Inclusion"	42.1	39.7
Standard Deviation OT	4.5	5.2
N	192	144
t value	1.75	
p value	0.082	

It is widely known that some study programs at the DL Campus offer online classes or DL classes that are accessible to every Indonesian citizen who is a UT student, even if they live or work outside the territory of Indonesia. This aligns with UT's vision to provide higher education that is open to anyone, anywhere. It's common for students from various locations to be in the same class. Speaking classes require synchronous speaking practice, so discussions between students and teachers are necessary to determine the timing, especially since they are in different time zones. Being punctual is a crucial aspect for them, both as students and professionals. As individuals grow older, their accumulated knowledge enhances their ability to make judgments about various aspects of life. This increased maturity contributes to thinking more openly and effectively (Al-Hassan and Ghudaib 2022).

"In the online class, we have a mix of students, some from Surabaya, Aceh, Bali, and occasionally even from abroad, like Malaysia and Taiwan. It was a bit challenging at first because we only communicated through a WhatsApp (group), but during the Speaking class, we ended up chatting a lot and sharing stories. We are all Indonesian citizens but work in different places. We adjusted to each other culturally so that we could learn together, especially regarding time management."
(Participant 79/ DL/ interview)

However, it should be noted that the t-test results indicated that the difference in mean OT ability between these two groups is not statistically significant. The t-value was 1.75 with a p-value of 0.082 ($p > 0.05$),

suggesting that this difference cannot be considered statistically significant. In the context of this study, although DL students had a slightly higher mean in the "Openness to Diversity and Inclusion" Element, this difference was not large enough to be considered significant. This may indicate that the two groups share a fairly high degree of similarity in this ability within the context of this study.

Based on their observation, the students were divided into the young students and the old students. Both groups also have different cultures, including their interaction styles in familiarizing themselves and learning. Despite sharing the same goal of learning or discussing, old students preferred informal socialization within the classroom environment, while young students preferred to choose settings outside the classroom or the study place.

"Yes, those who study at UT are not only the young ones (18-30 years old) but also older individuals, like me, who have children and grandchildren. We have our differences; they like to gather at cafes to eat, while my friends and I prefer to bring salads, young mango, tofu, chili sauce, and bengkoang to class. It feels more intimate. However, we still learn together, regardless of our preferences."
(Participant 16/ DL/ interview)

In Table 6, the data compared DL students and F2F students based on the Element 'Openness to Multiple Perspectives.' The analysis results showed that DL students have a higher average ability, with a mean OT value of 37.8, while F2F students have a mean OT value of 35.6. Although the standard deviations for both groups indicated relatively similar levels of variability in OT proficiency, the t-test revealed that the difference in mean OT proficiency between these two groups is statistically significant. The t-value of 2.12 with a p-value of 0.035 ($p < 0.05$) suggested that DL students exhibit a significantly higher level of 'Openness to Multiple Perspectives' compared to F2F students in the context of this study. This may reflect their ability to be more open to various viewpoints and diverse perspectives in the learning process. Furthermore, 'Openness to Multiple Perspectives' may hold particular importance, as it not only supports one's own view but also considers multiple viewpoints (Metz, Baelen et al. 2020).

Table 6. Comparison of Openness to Multiple Perspectives between DL's students and F2F's students

Variabel	DL students	F2F students
Mean "Openness to Multiple Perspectives"	37.8	35.6
Standard Deviation	4.2	4.8
N	192	144
t value	2.12	
p value	0.035	

Please note that for the educational study programs, the DL Campus only accepts students who are currently working as teachers in schools. On one hand, students in English Education study program generally have prior college experience at the undergraduate or diploma level but not in the field of education. On the other hand, they also possess teaching experience as teachers in schools, ranging from junior to high school levels. This rich experience, combined with their more mature age, appears to make them open to learning new things from their teachers or younger colleagues. This aligns with Haran, Ritov et al.'s (2013) findings, which suggest that individuals with high levels of Open Thinking tend to invest more effort in acquiring knowledge.

"We are teachers, even though we haven't graduated with a bachelor's degree in education; we have studied in other majors. We are learning once more, becoming students again. Moreover, there are lecturers who are younger (than us), so we have come to realize that our teaching, which we've been doing for so long, still requires a lot of improvement."
(Participant 11/ DL/ Interview)"

In Table 7, the data presented the comparison of 'Openness to Collaboration' between DL students and F2F students. The analysis results showed that DL students have a higher average ability, with a mean OT value of 40.3, while F2F students have a mean OT value of 37.8. The standard deviations for both groups indicated relatively similar levels of variability in OT ability. Importantly, the t-test results demonstrated that the difference in mean OT ability between these two groups is statistically significant, with a t-value of 2.61 and a p-value of 0.009 ($p < 0.05$). Therefore, in the context of this study, it can be concluded that DL students possess a significantly higher level of 'Openness to Collaboration' compared

to F2F students, indicating their ability to be more open to collaboration in the learning process.

Table 7. Comparison of Openness to Collaboration between DL's students and F2F's students

Variable	PJJ students	TM students
Mean Openness to Collaboration	40.3	37.8
Standard Deviation OT	4.0	4.5
N	192	144
t value	2.61	
p value	0.009	

Indeed, Collaboration is the best solution for DL students. Their busy lives as husbands or wives and as students can be overwhelming when trying to balance these dual roles. Their cognitive abilities tend to be limited. Therefore, collaborating with younger students is the most rational choice.

"I can't do it alone, sir. My children are still young, and my husband only wants my cooking. I can't learn by myself; I don't have the time. We have to rely on each other. It's just like that; in the end, I still often don't understand too well. I end up asking the younger ones. Hahaha."
(Participant 103/ DL/ Interview)"

It was clear that DL students have a higher average score (38.6) in the 'Openness to Sharing' Element, while F2F students have an average score of 36.2 (see Table 8). Although the standard deviations for both groups indicate relatively similar levels of variability, the t-test results reveal that the difference in mean OT ability between these two groups is statistically significant, with a t-value of 2.23 and a p-value of 0.020 ($p < 0.05$). Therefore, in the context of this study, it can be concluded that DL students possess a significantly higher level of 'Openness to Sharing' compared to F2F students, reflecting their ability to share thoughts and ideas in the learning process.

Table 8. Comparison of Openness to Sharing between DL's students and F2F's students

Variable	PJJ students	TM students
Mean Openness to Sharing	38.6	36.2
Standard Deviation OT	4.1	4.6
N	192	144
t value	2.23	
p value	0.020	

DL campus provide both print and online learning resources accessible via the web. This can be a significant advantage for DL students

as they can access these resources from anywhere without the need to carry heavy printed books. However, the use of online books is not always optimal due to the side effects of eye fatigue, which can be particularly challenging for older students. Consequently, they tend to rely more on their fellow students as a source of learning through discussions.

"We definitely help each other and share, especially among women. We even help each other with exam answers, hahaha. Sometimes, we make slight changes. During lectures, it's quite similar. Instead of looking for someone to provide exam answers, it's better to collaborate with friends. While there are online books available for study, I get tired from reading on my phone or laptop. Having a printed book is beneficial."
(Participant 148/ DL/ Interview)

From Table 9, based on the Element of 'Openness to Change', the analysis revealed that DL students have a lower average ability in this aspect. The standard deviations for both groups were relatively similar, indicating almost comparable levels of variability in OT ability. The conducted t-test yielded a t-value of -2.76 with a p-value of 0.006 ($p < 0.05$), indicating that the difference in mean OT ability between the two groups is statistically significant, with F2F students showing significantly higher levels of 'Openness to Change' in the context of this study."

Table 9. Comparison of Openness to Change between DL's students and F2F's students

Variable	PJJ students	TM students
Mean Openness to Change	35.9	38.5
Standard Deviation OT	4.4	4.3
N	192	144
t value	-2.76	
p value	0.006	

We acknowledge that one of the most significant changes in learning methods occurred during the COVID-19 pandemic (Hesran, Tohamba et al. 2022). The abrupt and drastic shift in methods required all parties involved (lecturers, administrators, students) to quickly adapt to the 'new normal.' F2F students, who are predominantly in the younger age group (under 30 years old), tend to adapt more rapidly to technology, such as the use of LMS and video conferencing tools like Zoom and Google Meet. With just a few tries, they quickly grasped how to use the technology.

"Maybe... one of the biggest changes was during COVID. Suddenly, all lectures became online, using Zoom. At first, it was a bit challenging because in the past, I used to attend

offline lectures. But after a few tries, I got the hang of it, whether it's Zoom or LMS. We just had to try it ourselves."
 (Participant 201/ F2F/ Interview)

Lastly, DL students have significantly higher "Openness to New Learning" abilities compared to F2F students. Although the standard deviations between the two groups were not significantly different, the t-test results showed that the difference in mean OT ability between the two groups was statistically significant, with a t-value of 2.17 and a p-value of 0.031 ($p < 0.05$). Therefore, DL students have a higher level of "Openness to New Learning" in the context of this study. This finding seems to corroborate Singh and Panigrahi's (2018) finding where the exposure of Open Learning Sources (OLS) constantly affects the OT of DL students. As the result, their Openness to New Learning is higher. Meanwhile, F2F students learning sources may be influenced by the individual creativity to obtain knowledge from various sources.

Table 10. Comparison of Openness to New Learning between DL's students and F2F's students

Variable	PJJ students	TM students
Mean "Openness to New Learning"	39.2	37.1
Standard Deviation OT	4.3	4.4
N	192	144
t value	2.17	
p value	0.031	

Inter-factor Correlation among Open Thinking's Elements

The OT Elements exhibited a relatively strong relationship with each other, with correlation coefficients ranging from 0.48 to 0.71, all of which are statistically significant ($p < 0.001$). Based on the correlation coefficients presented in Table 11, we uncovered some interesting relationships among the various Elements related to Openness to Diversity & Inclusion, Multiple Perspectives, Collaboration, Sharing, Change, and New Learning within a specific context.

Firstly, Diversity & Inclusion has a strong correlation with Change (0.71) as well as New Learning (0.63), suggesting that an inclusive and diverse environment can stimulate positive change and learning processes. Secondly, Collaboration also exhibited a strong correlation with Sharing

(0.64) and Change (0.66), indicating that effective teamwork can foster the exchange of ideas and innovation. However, it is important to note that correlation values do not imply causation, and other factors may influence the relationship between these variables. The data provides insights into the complexity of the relationships among different aspects of the context. Indeed, Moreover, these inter-factor correlation values reinforce the credibility and reliability test results of the OTS, as noted by Jung and Lee (2022).

Table 11. Inter-factor Correlation of Open Thinking's Elements of DL Students

Element	Diversity & Inclusion	Multiple Perspectives	Collaboration	Sharing	Change	New Learning
Diversity & Inclusion	1.00	0.55	0.48	0.46	0.71	0.63
Multiple Perspectives	0.55	1.00	0.51	0.59	0.50	0.50
Collaboration	0.48	0.51	1.00	0.64	0.66	0.72
Sharing	0.46	0.59	0.64	1.00	0.60	0.68
Change	0.71	0.50	0.66	0.60	1.00	0.61
New Learning	0.63	0.64	0.68	0.63	0.61	1.00

Table 12 revealed significant inter-factor correlations for the OT concept. Several important findings emerge from these correlations: 1) Diversity & Inclusion exhibited strong positive correlations with Collaboration (0.67), Sharing (0.53), Change (0.76), and New Learning (0.64). This indicates that individuals who support diversity and inclusion tend to be more collaborative, open to change, and inclined toward new learning and 2) Collaboration also shows strong positive correlations with Change (0.66) and New Learning (0.72), suggesting that collaboration is often associated with a willingness to change and embrace new learning. This analysis shares a similar finding to Svedholm-Häkkinen and Lindeman (2017), which explored the interrelationships among the OT elements.

While some correlations between other factors were relatively weaker, such as those between Multiple Perspectives and Collaboration (0.43), Multiple Perspectives and Sharing (0.59), and Multiple Perspectives and Change (0.50), this implies that having diverse viewpoints does not necessarily strongly correlate with the level of collaboration, propensity to

share, or openness to change. This complexity highlights the multifaceted nature of the relationship between OT factors in the context of this study.

Table 11. Inter-factor Correlation of Open Thinking's Elements at F2F Students

Element	Diversity & Inclusion	Multiple Perspectives	Collaboration	Sharing	Change	New Learning
Diversity & Inclusion	1.00	0.67	0.67	0.53	0.76	0.64
Multiple Perspectives	0.67	1.00	0.43	0.59	0.50	0.50
Collaboration	0.67	0.43	1.00	0.64	0.66	0.72
Sharing	0.53	0.59	0.64	1.00	0.60	0.63
Change	0.76	0.50	0.66	0.60	1.00	0.55
New Learning	0.64	0.64	0.72	0.63	0.55	1.00

CONCLUSION

All in all, DL English students seem to have higher OT skills than F2F English students in five OT Elements; apart from Openness to Change. In the 'Openness to Change' Element, F2F students have significantly higher levels than DL students. However, both groups of students are in the same level; moderate. Based on the results of the inter-factor correlations in the Open Thinking concept between the DL campus and the F2F campus, it can be seen that there are some significant differences in the relationship between the elements in both contexts. On the DL Campus, Diversity & Inclusion shows a strong correlation with Change and New Learning, while Collaboration has a significant correlation with Sharing and Change. On the other hand, on the F2F campus, Diversity & Inclusion had strong positive correlations with Collaboration, Sharing, Change, and New Learning, suggesting that on the F2F campus, support for diversity and inclusion is strongly associated with collaboration, openness to change, and new learning. While some correlations between factors exhibit weaker values such as the correlations between Multiple Perspectives and other factors, these findings suggest that, in both contexts, it is essential to comprehend the intricate and nuanced relationships between different aspects of OT. Notably, DL students, who vary in age, consistently exhibit higher OT levels than F2F students, despite the latter being significantly younger. This

suggests a simultaneous growth of age and OT proficiency among DL students.

We drew two main implications. First, understanding that both DL and F2F students obtain only a moderate level of OT, these universities should focus on creating an environment that supports the development and reinforcement of Open Thinking skills throughout the academic journey. This covers extracurricular activities, workshops, and continual integration of OT principles into various courses. In short, the activities are not limited to academic-centered but also emotion-centered that encourage intra- and inter-personal relationships. Second, the consistent higher levels of OT proficiency among DL students across different age groups, compared to younger F2F students, suggest that age might not be the one-and-only factor of OT proficiency. This insight implies that DL learning environments may inherently allow for the growth of OT skills across different age demographics.

The study's limitations include the participant pool primarily consisting of English Education students, limiting the generalizability of findings. Future studies could involve students from English Literature, Translation Studies, or Linguistics programs. Additionally, the qualitative data only complemented the quantitative results, suggesting the need for qualitative case studies. Longitudinal research exploring OT development from freshman to senior years in both F2F and DL settings could offer valuable insights.

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