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Students' engagement in online flipped Mandarin as a foreign language learning

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Abstract: This study examines how students respond to online flipped Mandarin as a foreign language (MFL) learning regarding their behavioural, emotional, cognitive and agentic engagement. It also explores MFL students' responses to language learning challenges provided via online flipped learning. This explanatory sequential mixed methods design study included 104 full-time undergraduate students participating in an elementary MFL course. The findings revealed that students were most involved in behavioural engagement and least in agentic engagement. The main code for language learning challenges was categorised into six themes: lack of self-efficacy, time management, social interaction issues, language elements, emotional problems, and physical environment constraints/technical difficulties. This study reveals that MFL students strived to adapt to the online flipped language learning approach compared to Mandarin language elements. Furthermore, it was observed that students had higher expectations of 'teacher being', which are affective aspects of being more involved in the learning context.

Keywords: online flipped language learning; students' engagement; Mandarin as a foreign language learning; Mandarin as a foreign language; MFL.

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1 Introduction

Over the years, online foreign language learning in higher education has been widely promoted to facilitate the learning of targeted languages (Lin and Warschauer, 2015). Although learning online is not new, online foreign language learning has become a 'new norm' due to the movement limitations triggered by the global outbreak of the COVID-19 endemic.

Language learning is referred to as skill-based learning as compared to content-based learning. Language skills, especially listening and speaking, needed constant interaction and participation in the target language (Gao, 2020; Sun, 2014). Mandarin as a foreign language (MFL) is one of the language learning fields affected by the COVID-19 outbreak (Gao, 2020).

To achieve the learning goals in MFL language learning, students must master all the language skills, such as listening, speaking, reading and writing. Tan et al. (2015) stated that the students, especially non-native speakers, found learning MFL challenging and did not achieve their learning goals in a face-to-face classroom setting.

Sun (2014) investigated students' perspectives on fully online MFL language learning and identified that students faced six main challenges, which are:

1 following a timetable and learning on a regular schedule

2 contacting peers and scheduling time to collaborate

3 mix up and manage collectively

4 maintain constant engagement in class

5 remain self-directed and self-motivated

6 as well as have social interaction.

The students developed new learning behaviours to overcome the challenges, such as self-directed and self-regulated learning (Sun, 2014).

Learning MFL became even more difficult during the COVID-19 outbreak. Since the classes are conducted fully online, face-to-face interactions are limited yet essential in foreign language education to develop students' language skills. To examine this issue, Gao (2020) conducted a study specifically on the challenges in teaching and learning Chinese characters among Australian students' during the COVID-19 outbreak.

The ability to engage students is a critical component of successful language learning (Sun, 2014; Yang, 2011). Constant engagement with the class is essential in promoting

online MFL language learning (Gao, 2020; Sun, 2014). Wellborn (1991) defined engagement as the degree to which a student actively participates in a learning activity. Reeve (2013, p.580) further explained that "engagement represents the range of action students take to advance from not knowing, not understanding, not having skill, and not achieving to knowing, understanding, having skill, and achieving." There are different dimensions of student engagement: behavioural, emotional, cognitive and agentic (Reeve, 2013).

An online flipped classroom was designed to improve students' engagement in an online learning experience with an active learning culture (Heiss and Oxley, 2021; Hew et al., 2020; Jia et al., 2021; Latorre-Cosculluela et al., 2021; Stöhr et al., 2020; Tang et al., 2020; Tseng et al., 2018; Wang, 2017). There are various problem-solving activities and a learning culture of self-assessment and self-reflection, which assists in promoting additional online learning activities. Nonetheless, adopting an online flipped learning approach presents significant challenges (Heiss and Oxley, 2021; Latorre-Cosculluela et al., 2021; Stöhr et al., 2020; Yen, 2020).

1.1 Background of study

In Malaysia, the MFL course is one of the popular foreign language courses among non-native speakers such as Malay, Iban, and other bumiputeras who register for this course every semester (Lam and Hoe, 2013). According to Lam and Kuan (2019), this is due to China's rapid growth in recent years and driven by Mandarin's status as one of the United Nations' six working languages.

At the study location, MFL courses have been offered as online elective courses since October 2020 to enable learning to happen when face-to-face instructions are ceased due to the COVID-19 outbreak. The students are evaluated based on Chinese characters in their assessments. Therefore, mastering Chinese characters is crucial for all MFL learners across language skills, such as speaking, reading, listening and writing (Lam and Hoe, 2013).

The online flipped learning approach was implemented in the online MFL courses during the COVID-19 outbreak. The online flipped language learning approach is analogous to the conventional flipped language learning approach. The conventional flipped language learning approach shifts or flips what is usually performed in class and as homework in a classroom.

Kim et al. (2014) explained conventional flipped language learning approach gives students access to online tutorials before pre-class sessions, preparing them to participate in more engaging and higher-order thinking activities such as discussions and hands-on practices. Students gain from pre-class sessions because they can schedule and pace their online tutorials to meet their understanding. In addition, students become more engaged and active in face-to-face classroom sessions by participating in group activities rather than simply listening to lectures. Instructors also can spend more in-class time monitoring students and delivering appropriate feedback to students.

On the other hand, the online flipped language learning process is entirely delivered online without face-to-face meetings and only meets in synchronous video conferencing. The online flipped classroom "consists of some form of pre-class activity (e.g., viewing videos), followed by interactive group learning activities during class meetings" [Jia et al., (2021), p.2].

In the present study, an online flipped classroom refers to asynchronous and synchronous online learning where the instructor and students only interact through the online platform. The MFL course instructor prepares several instructional activities (e.g., videos or basic materials) for students to study asynchronously in a learning management system (LMS) before the synchronous class via a video conferencing session. Active learning activities include knowledge application, such as discussion, presentation, and problem-solving reserved for synchronous class time.

1.2 Problem statement

Successful language learning depends on students' constant practice and greater involvement in all learning activities (Sun, 2014; Yang, 2011). In this study, an attempt to implement an online flipped learning approach was taken, and several instructional issues were observed.

The first challenge was the high reliance on students' self-discipline, self-motivation, and self-regulation to make the instructional sessions effective. I had little control over the situation when the students did not involve in the pre-class preparation activities in the LMS platform before the synchronous class. It is even more complicated when the students are from an elementary level with no basic knowledge of MFL. When students did not prepare for the synchronous class, they had difficulty participating in active learning activities during the synchronous class time.

Students must have self-regulation and a higher degree of responsibility to fulfil sufficient pre-class preparation activities (Latorre-Cosculluela et al., 2021; Silverajah et al., 2022; Yang, 2020). Students' self-regulation strategy can then convert into an efficient flipped learning approach implementation, instilling higher-order thinking abilities and a more vital comprehension of the subject matter in students (Yang, 2020).

The second challenge was developing students' language skills: speaking, listening, reading, and writing, which needed constant synchronous practice and communication in the target language. When the students turned off their microphones and cameras to maintain their privacy and reduce the cost of internet bandwidth, I faced difficulty engaging students in the speaking practice. In such circumstances, students cannot develop their speaking and listening skills as effectively as planned.

Related research was carried out by Sun (2014) and Gao (2020), who faced similar challenges when instructing online Mandarin courses. Sun (2014) even proposed that these obstacles can be overcome by redesigning the course that allows the students to change their learning behaviour to engage students better. Chuang et al. (2018) also highlighted that students' behaviour is one of the critical components of language learning. Hampel and Stickler (2015) stated that it is critical to comprehend how students engage with learning materials in actual situations and employ appropriate learning design to tackle language learning challenges. Rienties et al. (2018) added a need to identify how language teachers design their courses and the relationship between learning design and actual student behaviour.

It is worth identifying students' engagement in the online flipped MFL classroom to change their learning behaviour and environment, further engaging them to perform better in the flipped language learning process. Therefore, this study examines how MFL students engage in the online flipped learning environment in terms of their behavioural, emotional, cognitive and agentic engagement. This study also explores how MFL students respond to language learning challenges provided in online flipped learning.

There are two research questions were addressed in this study:

a How do students respond to the online flipped MFL learning in terms of behavioural, emotional, cognitive and agentic engagement?

b To what extent do MFL students respond to language learning challenges provided in online flipped learning?

2 Literature review

2.1 MFL language elements

Non-native speakers had difficulty learning MFL due to a lack of vocabulary for effective communication and being influenced by their mother tongue (Tan et al., 2015). Furthermore, Chinese character, phonetic, lexical, and grammatical acquisition were also complicated tasks for non-native speakers (Gong et al., 2020).

In MFL classrooms, the majority of MFL students struggle with their writing and speaking abilities (Lam and Kuan, 2019). MFL students, particularly those at the elementary level, found it challenging to acquire Chinese characters (Kuan, 2021; Lam et al., 2018). They need continuous practice before developing their language skills (Lam and Kuan, 2019). MFL courses offered at the study location required students to master 140 Chinese characters to cope with their assessments (Lam and Hoe, 2013). Even though the students were initially enthusiastic about studying MFL, they were demotivated since they could not acquire the desired language skills (Lam and Kuan, 2019).

It was found that most MFL students struggled with the phonological and orthographic aspects of the language during the COVID-19 outbreak in an online Mandarin course (Gao, 2020). In the same study, he described how the instructor found it challenging to engage students in listening and speaking tasks as well as verbal interactions. He also mentioned that students faced heavy workload demands from the course. Students were required to spend more time and effort on this subject; however, they were short on practice because of other commitments.

2.2 Online flipped learning approach

Many studies have reported positive results in the online flipped learning approach (Hew et al., 2020; Latorre-Cosculluela et al., 2021; Wang, 2017). Wang (2017) explored the effectiveness of online flipped classrooms from a behavioural perspective. His study indicated that an effective online flipped classroom was built around incorporating engaging and dynamic problem-solving activities and fostered a learning culture of self-assessment and self-reflection, which assists in stimulating other online learning activities. Hew et al. (2020) examined the effectiveness of online flipped classrooms on student learning performance during the COVID-19 outbreak. Their finding revealed that participants' performance in online flipped classes was just as good as in conventional ones. In a more recent study, Latorre-Cosculluela et al. (2021) proved that the online and flipped classroom model positively impacted the development of 21st-century skills useful for students' personal and career future.

It is interesting to view how online flipped learning is used in subjects other than language learning. For example, Stöhr et al. (2020) implemented an online flipped learning approach by adopting a longitudinal, quasi-experimental research design to analyse quantitative data in the modelling of nuclear reactors course. They proposed that future research should focus on how learning happens, such as changes in transactional distance, and those online instructors should think about how to engage students during these changes. Jia et al. (2021) employed an online flipped learning approach in the course of 'engaging adult learners' in the Faculty of Education with only 49 participants. Their study has proven that in promoting student learning outcomes, the community of inquiry (CoI)-based online flipped classroom was as effective as the conventional flipped classroom. They suggested that future research examine the students' challenges in the online flipped classroom. Another study by Heiss and Oxley (2021) employed an online flipped learning approach in the quantitative analytical course. They also reported that students preferred the online flipped learning approach over other forms of remote instruction during the COVID-19 outbreak.

Despite the advantages of implementing an online flipped learning approach, several previous studies indicated issues with doing so (Latorre-Cosculluela et al., 2021; Stöhr et al., 2020; Yen, 2020). Stöhr et al. (2020) raised the concern that implementing this approach benefited students with a strong capacity for self-regulated learning strategies and students with an excellent combination of time management and technology skills. Yen's (2020) finding indicated a significant gap between flipped classrooms' theoretical and practical knowledge and online instruction. In addition, participants' awareness of preview materials and homework feedback was poor, and there are still ways to increase students' engagement (Yen, 2020). In a more recent study, Latorre-Cosculluela et al. (2021) also stated that the online flipped approach only be applicable and ideally tailored to the context and unique circumstances if the students and instructors commit and take active accountability.

Existing literature shows that online flipped MFL language learning is still not widely explored. Previous studies are almost exclusively focused on implementing the online flipped learning approach in non-language classrooms. As a result, little research has been conducted on the online flipped learning approach in language classrooms. An exception is a study shown by Tseng et al. (2018). They conducted a study that employed the online flipped model in a kindergarten Mandarin Chinese classroom. The result indicated that the students were satisfied with the effectiveness of the online flipped learning approach. However, their study only had 35 participants and was constrained by the kindergarten level of Mandarin Chinese. They did not discuss students' engagement in the online flipped classroom.

To conclude, successful student engagement in online flipped learning heavily depends on how well students commit to all learning activities and how well the instructor develops the online learning environment. The body of research above also reveals a gap in the literature assessing MFL students' engagement in the online flipped learning environment regarding behavioural, emotional, cognitive and agentic engagement. It was also found that there was limited research on how MFL students respond to language learning challenges provided in online flipped learning.

2.3 Students' engagement

In language learning, much attention has been paid to studying students' behaviour and the learning process (Chuang et al., 2018). Student engagement in language learning is crucial because it allows learning to occur, as it is hard to portray learning a foreign language without direct interaction (Reeve, 2012). The terms 'engagement, interaction, and participation' are synonyms throughout this paper.

Astin (1984) developed an 'engagement theory', which stated that a more successful student is more engaged in learning. Since the introduction of the theory, there have been various definitions of students' engagement, resulting in differing perspectives. Previous studies have investigated the different dimensions of student engagement (Fredricks et al., 2004; Jamaludin and Osman, 2014; Steen-Utheim and Foldnes, 2018).

Fredricks et al. (2004) attempted to identify three critical dimensions of engagement: behavioural engagement, cognitive engagement, and affective engagement for general students' engagement in the education setting.

Jamaludin and Osman (2014) investigated behavioural, emotional, cognitive, and agentic engagement to enhance active learning in 24 undergraduate teaching English to speakers of other languages (TESOL) students using conventional flipped learning. They used Reeve's (2013) quantitative structured questionnaire for this purpose. Reeve (2013) categorised the students' engagement into four-aspect conceptualisation engagement: behavioural, emotional, cognitive and agentic engagement. Jamaludin and Osman's (2014) study found that emotional engagement is most remarkable, followed by behavioural engagement, cognitive engagement and agentic engagement. Nevertheless, their research was limited to conventional flipped language learning rather than online.

Steen-Utheim and Foldnes (2018) stated that the socio-cultural perspective in which student interaction is rooted includes psychological and behavioural aspects of student learning. They mentioned that the affective dimension of student engagement is especially noticeable when students reflect on their learning in the conventional flipped classroom. This was followed by the cognitive dimension of engagement, with students in flipped learning discovering more from their peers. The behavioural dimension of engagement was not prominent in their findings.

In a systematic review study, Bond (2020) observed that most flipped learning studies demonstrated behavioural engagement; while some included emotional and cognitive engagement, others established all behavioural, affective, and cognitive engagement characteristics. The five most often reported engagement criteria were greater communication with peers, enjoyment, participation/involvement, greater teacher communication and greater confidence.

Other researchers have looked at online student engagement. Student engagement is particularly essential in the online learning environment, where students can frequently feel alienated and isolated (Dixson, 2015). Dixson (2015) further explained that student engagement implies dedicating time, energy, thought, effort, and emotional states to their learning.

Redmond et al. (2018) proposed a conceptual framework with five key elements for online engagement: social, cognitive, behavioural, collaborative and emotional engagement. Yang (2011) investigated students' behavioural, emotional, and cognitive engagement in computer-mediated communication (CMC) in an English language learning environment. More recently, as shown by Adams et al. (2021), students in online learning had higher behavioural engagement levels than cognitive and emotional

engagement. They also discovered that male students participated in more online learning activities than female students.

There are numerous positive outcomes when students are engaged in the classroom. Student engagement must be considered a psychosocial process influenced by individual and social factors. Motivated and engaged students learn more effectively and achieve the best possible results (Saeed and Zyngier, 2012). Reeve (2012) described there are three purposes of students' engagement which are:

1 to mediate the motivation-to-achievement relation

2 to change the learning environment

3 to change students' motivation.

Reeve et al. (2019) supported these claims by stating that increasing student engagement can help students achieve academic success, fulfil their motivational factors, and establish cognitively active learning.

Communication is one of the most significant aspects of promoting students' engagement in the thriving online flipped course (Tang et al., 2020). The study by Thornberg et al. (2020) discussed that one of the key aspects that might boost student engagement is the 'teacher being'. They further said that professional teaching principles of compassion, justice, caring, sincerity, and empathy could effectively enhance student engagement. Brandon (2020) also discussed how addressing student needs through organised delivery of practical and relevant instructional material as well as concern for students' social and mental health can promote high student engagement in the online flipped classroom.

In conclusion, it is vital to identify the critical dimensions of students' engagement in online flipped MFL learning to engage better the MFL students with the course content, peers, and instructors. This ties in with the work of Purarjomandlangrudi et al. (2016), Martin and Bolliger (2018), as well as Leslie (2019). They indicated that understanding students' engagement dimensions could enhance their online interaction. As a result, students can achieve better results and outcomes from online learning by manipulating and coordinating these characteristics.

2.3.1 Behavioural engagement

Indicators of behavioural engagement included more significant effort, sustained attention, as well as attention, and concentration while working on a task (Reeve, 2012). In tandem with Reeve (2012), Redmond et al. (2018) described how behaviourally engaged students demonstrated an interest in learning and obtained high involvement; they also sought and provided additional support to others when necessary. Students developed knowledge and skills to contribute to these learning behaviours that contributed to their successful learning outcomes.

Attendance, involvement, and assignment completion were examples of observable behaviours components of academic success (Fredricks et al., 2004; Adams et al., 2021). Reeve et al. (2019) explained that behaviourally engaged students put a more significant proportion of their energy into the learning activity and continued doing that over time.

Jamaludin and Osman (2014) reported that from the language learning perspective, high behavioural engagement led to active learning in the TESOL classroom with the assistance of the conventional flipped learning environment. The examples of high

behavioural engagement were students listening carefully to instructions, paying attention, working hard, and participating in-class activities.

For the context of the present study, which investigates online-based learning engagement, a study by Yang (2011) explained how in CMC or an online situated language learning environment, statistics from log data, such as log-in and log-out time intervals, system enquiries, and overall usage of the discussion forum can be used to measure behavioural engagement.

Bond (2020) added that increased peer interaction was the most often highlighted example of behavioural engagement in flipped learning. It was subsequently followed by higher class involvement and more interaction with instructors.

2.3.2 Emotional engagement

Positive or negative emotional responses toward instructors, course mates, or learning, as well as dialogues and belongingness, were all indicators of emotional engagement (Adams et al., 2021; Bond, 2020; Fredricks et al., 2004; Wimpenny and Savin-Baden, 2013; Yang, 2011).

Emotional engagement is deconstructed further to demonstrate deep-rooted issues of resistance and resilience (Wimpenny and Savin-Baden, 2013). Emotional engagement also is the existence of undertaking emotions (interest, curiosity and enthusiasm) and the lack of undertaking emotions (distress, anger, frustration, anxiety and fear) (Reeve, 2012).

There have been various attempts to understand emotional engagement. Yang (2011) explained that online group discussions could assess emotional engagement. Based on Jamaludin and Osman's (2014) findings, students who did not receive feedback in class or on the discussion board had difficulty learning about that subject from the material posted. Therefore, in a conventional flipped classroom, discussion boards and problem-solving activities could generate emotional engagement, which leads to active learning.

Students' emotional engagement in the learning process could be seen in their behaviour, enthusiasm, involvement, anxiety, or pleasure (Redmond et al., 2018). The same study further elaborated that students' emotional response to learning is emotional engagement. They explained that students who value learning and developing skills, knowledge, and success would demonstrate positive emotional engagement.

Reeve et al. (2019) added that emotionally engaged students felt satisfied and enjoyed participating in the learning activity. Dewaele and Li (2020) and Kralova et al. (2022) also explained that observing students' emotional responses may allow dynamic pedagogical adaptation for effective instructional practices.

2.3.3 Cognitive engagement

Cognitive engagements included the implementation of refined, profound, and adapted learning methods, pursuing critical thinking over surface knowledge, and implementing self-regulation methods (Reeve, 2012).

In the same vein, Redmond et al. (2018) described cognitive engagement as students' thinking and doing in promoting learning. They provided examples of cognitive engagement on two levels: surface and deep cognitive engagement in the online learning environment. They identified that students with surface cognitive engagement had

the characteristics of commitments: finding alternatives without interpretation or rationalisation, quoting ideas without verification, or doing general discussions with others without elaboration or further participation. Students with deep cognitive engagement had a mental and emotional investment in learning, an orientation for the challenge, and a desire to go beyond basic requirements. They maintained engagement by being persistent, and they can always relate new knowledge with prior knowledge.

It was also revealed that the level of cognitive engagement was influenced by the instructor's accordance with the needs of activities and assessments (Redmond et al., 2018). Students' cognitive engagement could be assessed through their interaction in the learning process for critical thinking, problem-solving and forward-thinking activities and assessments (Adams et al., 2021; Reeve et al., 2019; Yang, 2011).

Cognitive engagement is students' concentrated effort to comprehend what they are being taught, including metacognitive and self-regulation manners (Fredricks et al., 2004). They further explained that cognitive engagement is distinct from behavioural engagement in that it focuses on the less noticeable work required in mind.

Inquiring leads to interaction between the instructors and the students in conventional flipped language learning was an example of cognitive engagement (Jamaludin and Osman, 2014). Students were cognitively engaged when they connected the ideas to their personal experience, linked them to prior knowledge, accommodated different ideas together, made logical sense, and generated explanations to comprehend the concept.

2.3.4 Agentic engagement

Reeve (2012) pointed out gaps in students' agentic participation in the learning process. As a result, he proposed adding a new concept, agentic engagement, to the present ideas of behavioural engagement, emotional engagement, and cognitive engagement. He defined agentic engagement as a purposeful, active, and practical contribution to the instruction. He explained that agentic engagements' examples are providing input, suggesting an alternative, expressing a favourite, devoting valuable something, asking for clarification, asking for an explanation, advising on the solution of a problem, or other constructive and personalising actions that conceptually improve the students' learning environment. When the instructors agentically engage students, they can work cooperatively with their students to develop a more motivational and personalised productive learning environment (Reeve, 2013; Reeve et al., 2019).

Jamaludin and Osman (2014) reported that students were not engaged in a higher agentic engagement in their conventional flipped English language learning. They claimed that it might be because that was students' first-time experiencing flipped language learning. Therefore, the students did not entirely contribute to their learning content during class. However, there were agentic engagements when students communicated their preferences, requested the lecturer if they ever needed something in class, and made the necessary modifications in their learning process.

3 Methodology

3.1 Research design

An explanatory sequential mixed methods design study was the chosen methodology of the present study. Creswell and Creswell (2018) stated that mixed methods research offers a comprehensive, diverse approach to study. This research methodology involved collecting quantitative data and then explaining the quantitative data with in-depth qualitative data.

The quantitative part of this study was descriptive survey research. The survey was cross-sectional, with data collected at one particular time and helped collect data on a person's practices and attitudes and assesses programmes (Creswell and Creswell, 2018). Reeve's (2013) quantitative survey was used to examine students' responses to online flipped MFL learning regarding behavioural, emotional, cognitive and agentic engagement.

The second part of this study is qualitative, and the data were analysed based on theme analysis guided by the grounded theory method. Grounded theory is a qualitative research design in which the researcher develops a broad understanding of a process, activity, or interaction based on the perspectives of many participants (Creswell and Poth, 2016). Grounded theory is also a systematic manner of generating theory from data through ongoing evaluation and coding procedures (Vollstedt and Rezat, 2019). Thematic analysis is performed using an inductive technique, which allows the data to determine the themes. Braun and Clarke's (2006) five stages' thematic analysis was used in the present study. Sun's (2014) open-ended questions survey was employed to explore how MFL students respond to language learning challenges provided in online flipped learning.

The study employed students' self-reflection (open-ended questions) as a data source because genuine perception would be crucial in generating trustworthy conclusions for the quantitative survey. The open-ended questions survey was completed after the quantitative data was collected and reviewed, following the explanatory sequential mixed methods design.

3.2 Participants and materials

For the quantitative method, convenience sampling was used in the present study. The sample group is a group of full-time undergraduates enrolled in elementary MFL classes in semester 1, session 2021/2022.

A convenience sample is alternately referred to as a random sample because items include in the selection simply because they are physically or logistically close to where the researcher is convenient, economical, and easily accessible to collect data (Etikan et al., 2016; Rahi, 2017). The primary assumption underlying convenience sampling for the present study is that the sample group was homogeneous. There would have been no difference in the research findings generated from a random sample or a sample drawn from an isolated part of the population (Etikan et al., 2016).

Invitations to participate in the quantitative survey part of the study were sent to a group of full-time undergraduates enrolled in elementary MFL classes in semester 1, session 2021/2022. The actual final sample size for the survey was 104 participants. The web-based survey instrument, Reeve's (2013) quantitative survey sent to all participants

with the demographic information (age range, gender, ethnic group, year of study and faculty) requested.

For the qualitative method, the unit of analysis was the individual. Participants were determined using purposive sampling (Creswell and Poth, 2016). The selection of the participants was focused on students who obtained the highest scores in elementary MFL classes among the 104 survey participants from Reeve's (2013) quantitative survey who indicated a willingness to participate in the open-ended questions survey process. When a saturation point was met, a decision to cease the recruitment of participants was determined. Eight participants were asked to participate in the open-ended questions survey.

All the participants from the sample group attended the online flipped Mandarin classes for 14 weeks of one academic semester. Because of the nature of this MFL course, the students must master Chinese character writing skills instead of using the Mandarin Romanisation system (Hanyu pinyin). They must master 140 Chinese characters to score in their assessments that evaluate their speaking, reading, listening and writing skills. They also need to attain knowledge of phonetics and grammatical.

3.3 Data collection procedures

3.3.1 Research instrument and procedures

Two existing instruments were used in the study. Reeve's (2013) quantitative survey was adapted with minor modifications for the quantitative method to examine how students respond to online flipped MFL learning in terms of behavioural, emotional, cognitive and agentic engagement. This instrument used a seven-point Likert scale that ranges from 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = agree to 7 = strongly agree.

On 10 January 2022, I put Reeve's (2013) quantitative structured survey into the web-based survey platform Google Form, and a WhatsApp message for the survey was sent to the study population. The WhatsApp message included a link to the web-based survey, outlined the study's goal, and underlined the students' willingness to participate was sent to research participants. The WhatsApp message further said that electronically submitting the survey would represent voluntary participation. The need for data confidentiality was also underlined, and all responses were anonymous. Students were initially given a 30-day deadline to complete the questionnaire. The questionnaire ended on 10 February 2022, with 104 responses.

Sun's (2014) open-ended questions survey was adopted as the qualitative method to explore how MFL students respond to language learning challenges provided in online flipped learning. The open-ended questions survey was distributed to eight excellent students in elementary MFL classes who had participated in Reeve's (2013) quantitative survey.

I carried out a qualitative analysis of the written responses provided by participants. Participants' unstructured comments of up to 200 words can be added. The study aims to develop 'stories' for qualitative analysis and emphasise the significance of asking and assessing open-ended questions in structured surveys (O'Cathain and Thomas, 2004).

The survey was prepared on Google Forms and sent to eight students using the Whatsapp platform. Together with a link to the survey, the invitation to participate was sent out on 15 February 2022, and the survey was completed on 20 February 2022.

Participants were given general information about the study and the survey's objectives. The survey was closed with eight responses received.

Participants for Sun's (2014) open-ended questions survey were required to indicate that their participation was entirely voluntary. Although the survey was not anonymous, the responses were anonymised for analysis.

Appendix 1 contains Reeve's (2013) quantitative survey, and Appendix 2 contains Sun's (2014) open-ended questions survey.

3.3.2 Validity and reliability

3.3.2.1 Quantitative part

Reeve's (2013) quantitative survey reported their validity and reliability values. The inter-item consistency reliability value was determined by the reliability of Reeve's (2013) quantitative survey and when all the Cronbach alpha values were more significant than the 0.7 cut-off value (Jamaludin and Osman, 2014).

There are different types of validity tests: criterion validity, face validity, content validity and construct validity (Taherdoost, 2016). For this study, both face and content validity are being assessed. Taherdoost (2016) explained that face validity refers to how testing instrument items appear to be measured physically and conceptually. Meanwhile, content validity refers to the degree to which the items in measurement are relevant, appropriate, and indicative of the research concept. Reeve's (2013) quantitative survey is suitable for relevance and connection to this study's research objective. The survey examined how students respond to the online flipped MFL learning approach regarding behavioural, emotional, cognitive and agentic engagement.

The instrument's most frequently used internal consistency measure for reliability is Cronbach's alpha (α), typically read as the mean of all potential split-half coefficients, and it is calculated from the average intercorrelations of the scale's items and the scale's total number of items (Mohajan, 2017). Cronbach (1951) stated that Cronbach's alpha (α) greater than 0.7 is generally regarded as acceptable and satisfactory, more significant than 0.8 as pretty good, and greater than 0.9 as indicating excellent internal consistency (as cited in Mohajan, 2017). Nunnally and Bernstein (1994) further suggested that a range of 0.7 to 0.8 is considered appropriate for alpha value estimates in the social sciences (as cited in Mohajan, 2017).

Before refining and distributing Reeve's (2013) quantitative survey to the students, a pilot test was conducted to ensure the validity and reliability of the survey. The survey for the pilot test was distributed to a representative sample of 30 MFL students to minimise any vagueness regarding its words and questions to reduce threats to its validity and reliability. Finally, the reliability of the scales for the pilot study was tested using Statistical Package for the Social Sciences (SPSS) version 26 software and utilising Cronbach's alpha coefficient of internal consistency. The pilot test's results indicated that:

a the internal consistency of the behavioural engagement is $\alpha = 0.951$

b the internal consistency of the agentic engagement is $\alpha = 0.969$

c the internal consistency of the cognitive engagement is $\alpha = 0.961$

d the internal consistency of the emotional engagement is $\alpha = 0.975$.

This pilot study was conducted during semester 2, session 2020/2021.

For the main study, the inter-item consistency reliability value of the instrument was also tested using SPSS version 26 software. This main study was conducted during semester 1, session 2021/2022. Based on Table 1, the instrument's Cronbach's alpha (α) all ranged from $\alpha = 0.927$ to $\alpha = 0.952$ were considered reliable.

Table 1 Reliability values for the main study

Variable (dimension of engagement)	*Cronbach's alpha*	*Cronbach's alpha based on standardised items*	*Number of items*
Behavioural	0.936	0.936	5
Agentic	0.938	0.941	7
Cognitive	0.927	0.931	4
Emotional	0.952	0.954	5

3.3.2.2 Qualitative part

For the open-ended questions survey, Sun (2014) used Biasutti's (2011) five processes to increase the trustworthiness of the open-ended questions survey. The process included five phases:

1 immersion (recognising all the different discernible answers)

2 categorisation (categories emerging)

3 phenomenological reduction (establishing themes)

4 triangulation (sustaining researcher's interpretations)

5 interpretation (explaining regarding previous research).

For the present study, I implemented Lincoln and Guba's (1985) criteria of creditability, transferability, dependability, and confirmability to establish qualitative trustworthiness.

Credibility emerged from data collection and processing extensiveness, equivalent to internal validity in quantitative investigations (Anney, 2014). I used member-checking to ensure the internal validity of the qualitative results in this study. During the member-checking phase, I sent a WhatsApp message to the eight students requesting them to study the thematic code diagram, which describes the main themes that emerged from the open-ended questions survey (see Figure 1). This is to see whether the results matched what they had filled out in the open-ended survey as represented in the code diagram.

Qualitative research findings may be applied to various contexts or settings with different participants or equal to external validity referred to as transferability (Anney, 2014). Purposive sampling was used to select the participants for the open-ended survey. To establish transferability, I utilised original excerpts to describe the findings connected to external validity.

The consistency of results across time is dependability (Anney, 2014). For this investigation, the code-recode strategy was used to assure dependability. I coded the same data twice using the code-recode strategy, allowing one week between each coding. The results of the two codings are compared to determine whether they are the same or different (Anney, 2014). MAXQDA (v. 2022) software was used in this study to create

an audit trail. This enables me to thoroughly understand the data's patterns and participants' perspectives.

Confirmability refers to how the study's conclusions can be confirmed and drawn from the data or supported by other studies (Anney, 2014). One confirmability strategy was taken, which is methodological triangulation. Methodological triangulation was used to examine the consistency of the findings collected between the quantitative and qualitative parts of the study.

3.4 Data analysis procedures

3.4.1 Quantitative part

The SPSS version 26 software was employed for all quantitative data analysis to examine MFL students' responses to online Mandarin learning in terms of behavioural, emotional, cognitive and agentic engagement.

The data was first download in excel format from the online Google Form and then imported into SPSS version 26. The normality test was computed to check the data distribution. After that, a reliability test was run to check the internal consistency of the variables (the Cronbach alpha value) for each variable: behavioural engagement, emotional engagement, cognitive engagement and agentic engagement.

All 104 total responses were used because all are complete responses. The analysis results were narrative style, and tables were needed to offer a clear visual representation of the data. Cronbach's alpha internal consistency reliability was examined using average inter-item correlation.

For Research question 1, descriptive analysis was used to report each survey question, including the means and standard deviations for these four variables (behavioural engagement, emotional engagement, cognitive engagement and agentic engagement).

3.4.2 Qualitative part

Qualitative data from eight participants were collected through Sun's (2014) open-ended questions survey. The open-ended questions survey was downloaded in excel format from the online Google Form and then imported into MAXQDA (v. 2022). MAXQDA is a software tool for mixed methods data analysis (Kuckartz and Rädiker, 2021). MAXQDA's tool allows researchers to organise, code, and analyse data to illustrate emerging themes (Marjaei et al., 2019).

The qualitative data was analysed based on theme analysis guided by the grounded theory method. Thematic analysis has five stages: entirely familiarising with the text, categorising the data, developing themes by identifying their structures, reviewing themes to evaluate whether they portray the collected data accurately or not, and lastly, specifying and emerging themes (Braun and Clarke, 2006). The thematic analysis was carried out by reading the responses and generating a coding frame to characterise the contents of the responses. It is further reviewed and then reread several times. A code that conveyed the gist of the participants' responses was assigned, and I added the frame code to all comments. Code-recode strategy was implemented as recommended by Anney (2014). A recoding process was done after one week. Genuine responses have been presented to demonstrate the detected themes.

Open, axial, and selective coding were also used to analyse the open-ended questions survey (Vollstedt and Rezat, 2019). Open coding is a technique for recognising and labelling similar concepts or themes from data. I employed open coding to explore how MFL students respond to language learning challenges provided in online flipped learning.

Open coding was also used to identify the main theme from the data. Axial coding refers to linking and merging codes into major categories. In other words, the coded labels are continuously compared to one another and integrated into broader categories during the open coding phase. Finally, selective coding means the action of incorporating the various categories generated, elaborated, and functionally connected throughout axial coding into a unified theory.

For research question 2, a code list was developed using MAXQDA (v. 2022). The main code falls into six themes and is followed by four sub-codes based on analysing the responses to the study questions.

3.5 Ethical considerations

For the quantitative method, WhatsApp text messages were sent to a group of full-time undergraduates enrolled in elementary MFL classes in semester 1, session 2021/2022, before inviting them to the quantitative survey.

For the qualitative method, WhatsApp text messages were sent to eight students who obtained the highest scores in elementary MFL classes to invite them to participate in the open-ended questions survey after completing the quantitative survey.

The WhatsApp text message invitation was written to understand that participation in the quantitative structured questionnaire and open-ended questions survey is voluntary. All responses would be kept strictly confidential. All the participants were informed about the purpose of the research and the time required to participate. All the information and data provided in the quantitative survey and open-ended questions survey were used for research purposes only. The participants were informed that they reserve the right to withdraw or not answer any questions in their quantitative structured questionnaire and open-ended questions survey. All participant responses are anonymised. Participants electronically submitted the informed consent form before proceeding with the study.

4 Results

The general quantitative and qualitative results are analysed and presented sequentially following the explanatory sequential mixed methods design study. I then merge the two results by bridging the quantitative results to the qualitative data collection in the discussion.

4.1 Quantitative results

Demographic information for the participants of the present study is shown in Table 2.

Table 2 Demographic information

Variable	*Frequency*	*Percentage (%)*
Gender		
Male	16	15.40
Female	88	84.60
Age		
20–25	102	98.10
Less than 20 years old	2	1.90
Ethnic group		
Malay	25	24.00
Indian	6	5.80
Chinese	3	2.90
Iban	33	31.70
Bidayuh	4	3.80
Kadazan	5	4.80
Siamese	2	1.90
Melanau	10	9.60
Others	16	15.40
Year of study		
First-year	5	4.80
Second-year	66	63.50
Third-year	28	26.90
Fourth-year	4	3.80
Fifth-year	1	1.00
Faculty		
Faculty of Computer Science and Information Technology	6	5.80
Faculty of Economics and Business	29	27.90
Faculty of Applied and Creative Arts	9	8.70
Faculty of Cognitive Sciences and Human Development	5	4.80
Faculty of Resource Science and Technology	9	8.70
Faculty of Social Sciences and Humanities	15	14.40
Faculty of Language and Communication	31	29.80

104 students (five first-year students, 66 second-year students, 28 third-year students, four fourth-year students, and one fifth-year student) participated in this quantitative part of the study. They comprised 16 males and 88 females, with 102 being between 20 and 25 years old and two under 20 years old. As all participants were in elementary MFL classes, they had no prior understanding of Mandarin. Iban (31.70%) and Malay (24%) were the two most prominent ethnic groups enrolled in this MFL course. The top three faculties that took MFL were the Faculty of Language and Communication (29.80%), the Faculty of Economics and Business (27.90%), and the Faculty of Social Sciences and Humanities (14.40%).

Table 3 shows that behavioural engagement has the greatest mean (M = 6.6019, SD = 0.75169), followed by emotional engagement (M = 6.5712, SD = 0.74125), cognitive engagement (M = 6.2524, SD = 0.81289), and agentic engagement (M = 5.9107, SD = 0.94890) in responding to online flipped MFL learning.

Table 3 Average mean and standard deviation for each of the dimensions of engagement

Variable (dimension of engagement)	*N*	*Minimum*	*Maximum*	*Mean*	*Std. deviation*
Behavioural	104	2.40	7.00	6.6019	0.75169
Emotional	104	2.40	7.00	6.5712	0.74125
Cognitive	104	2.75	7.00	6.2524	0.81289
Agentic	104	2.86	7.00	5.9107	0.94890

The four variables: behavioural engagement, agentic engagement, cognitive engagement, and emotional engagement, were rated as slightly agree and agree on average. It has proven that students respond positively to online flipped MFL learning regarding behaviour, emotional, cognitive and agentic engagement.

Table 4 Mean and standard deviation for every item in behavioural, agentic, cognitive and emotional engagement

Variable		*Mean*	*Std. deviation*
Behavioural engagement			
1	When I am in the synchronous class, I listen very carefully.	6.61	0.886
2	I pay attention to synchronous class and asynchronous class.	6.57	0.901
3	I try hard to do well in Mandarin class (synchronous class and asynchronous class).	6.64	0.787
4	In Mandarin class (synchronous class and asynchronous class), I work as hard as I can.	6.64	0.799
5	When I am in Mandarin class (synchronous class and asynchronous class), I participate in every discussion, quiz and activity.	6.55	0.835
Agentic engagement			
6	I let my instructor know what I need and want.	5.97	1.047
7	I let my instructor know what I am interested in.	5.97	1.101
8	During Mandarin class (synchronous class and asynchronous class), I express my preferences and opinions.	5.63	1.27
9	During Mandarin class (synchronous class and asynchronous class), I ask questions to help me learn.	5.55	1.261
10	When I need something in this class, I will ask the instructor for it.	5.91	1.158
11	I adjust whatever we are learning so I can learn as much as possible.	6.13	0.925
12	I try to make whatever we are learning as interesting as possible.	6.2	0.959

Table 4 Mean and standard deviation for every item in behavioural, agentic, cognitive and emotional engagement (continued)

Variable		*Mean*	*Std. deviation*
Cognitive engagement			
13	When I study for Mandarin class (synchronous class and asynchronous class), I try to connect what I am learning with my own experiences.	6.34	0.82
14	I try to make all the different ideas fit together and make sense when I study for Mandarin class (synchronous class and asynchronous class).	6.22	0.847
15	When doing work for Mandarin class (synchronous class and asynchronous class), I try to relate what I'm learning to what I already know.	6.32	0.884
16	I make up my own examples to help me understand the important concept I am studying for Mandarin class (synchronous class and asynchronous class).	6.13	1.025
Emotional engagement			
17	When we work on something in Mandarin class (synchronous class and asynchronous class), I feel interested.	6.57	0.798
18	Mandarin class (synchronous class and asynchronous class) is fun.	6.63	0.74
19	I enjoy learning new things in Mandarin class (synchronous class and asynchronous class).	6.64	0.762
20	When I am in Mandarin class (synchronous class and asynchronous class), I feel good.	6.5	0.892
21	When we work on something in Mandarin class (synchronous class and asynchronous class), I get involved.	6.52	0.847

From the data in Table 3, the standard deviation showed that the degree of consistency among the four variables is quite close, ranging from 0.74125 to 0.94890. Emotional engagement has a low standard deviation among four variables, 0.74125, which means that the data are closely scattered around the mean, indicating more consistency, predictability and reliability. Most students agreed that they were emotionally engaged in online flipped Mandarin learning.

The agentic engagement has a high standard deviation, 0.94890, showing that the data is widely spread, indicating that responses were polarised. Most students strongly agreed that they were agentically engaged (rated '7 = strongly agree'). However, a more minor of students faced problems in agentic engagement (rated '1 = strongly disagree').

Table 4 displays that overall, across four dimensions of student engagement, most students felt more behaviourally engaged, which reflect in item 3: 'I try hard to do well in Mandarin class (synchronous class and asynchronous class).' (M = 6.64, SD = 0.787) and item 4: 'In Mandarin class (synchronous class and asynchronous class), I work as hard as I can.' (M = 6.64, SD = 0.799). The students were also emotionally engaged, which reflect in item 19: 'I enjoy learning new things in Mandarin class (synchronous class and asynchronous class).' (M = 6.64, SD = 0.762). On the other hand, they felt less agentically engaged, which is shown in item 9: 'During Mandarin class (synchronous class and asynchronous class), I ask questions to help me learn.' (M = 5.55, SD = 1.261).

The standard deviation for each item in the four dimensions of student engagement also revealed a high consistency among the four variables, ranging from 0.74 to 1.27.

4.2 Qualitative results

For the qualitative part of this study, eight students (three males and five females) aged 20 to 25 years old were invited for the qualitative open-ended question survey.

The code list was generated, and the main code fell under six themes: lack of self-efficacy, time management, social interaction issues, language elements, emotional problems, and physical environment constraints/technical difficulties. The following sub-codes are behavioural, emotional, cognitive and agentic engagement. The diagram (Figure 1) illustrates the main code and sub-codes relationship.

Figure 1 The relationship between the main code and sub-codes (see online version for colours)

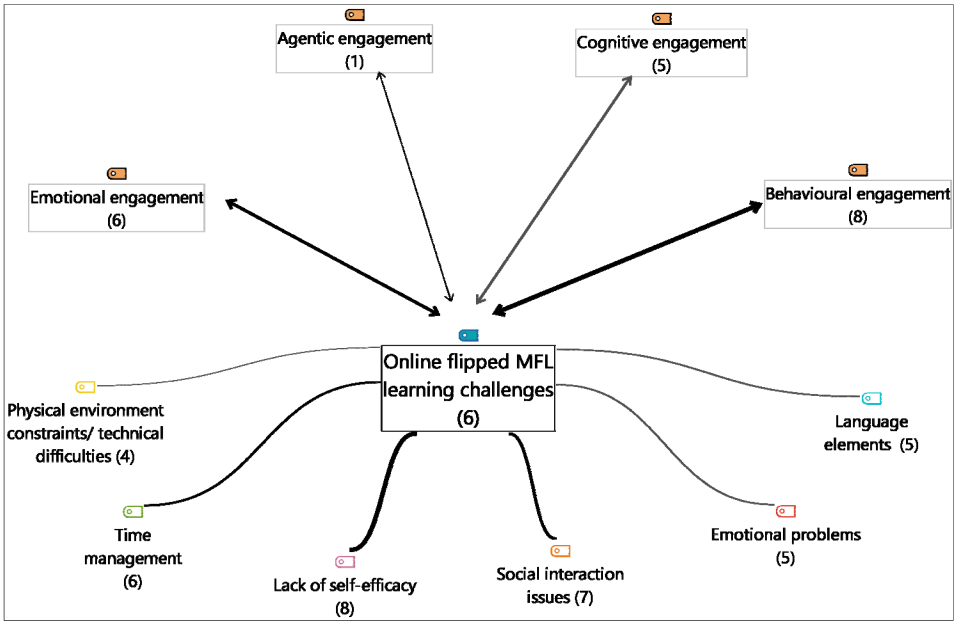


Table 5 Identified main code and sub-codes

Main code (online flipped MFL learning challenges)	*Sub-code (dimension of engagement)*
Lack of self-efficacy (self-discipline, self-motivation, and self-regulation)	Behavioural/emotional/cognitive/agentic
Social interaction issues	Behavioural/emotional
Time management	Behavioural/emotional
Emotional problems	Emotional
Language elements (Chinese characters, phonetics, and grammatical)	Behavioural/cognitive/agentic
Physical environment constraints/technical difficulties	Behavioural

The identified main code and sub-codes are presented in Table 5.

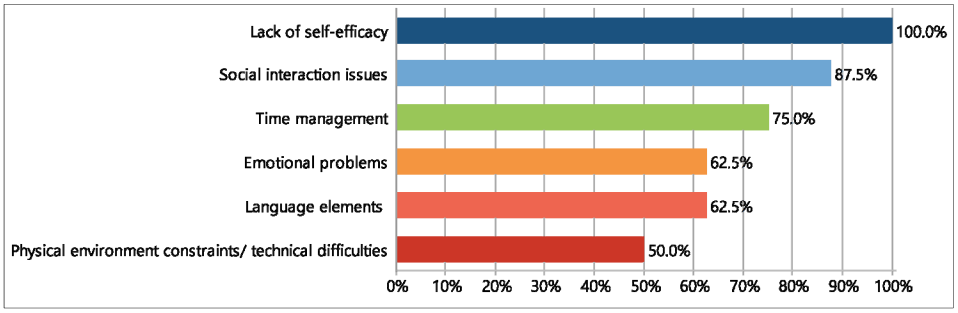
Table 6 Dimension of students' engagement

Sub-code (dimension of engagement)	*Frequency*	*Percentage (%)*		*Summary of responses from the open-ended questions survey*
Behavioural	8	100.00	1	Adjusting study time.
			2	Did many exercises.
			3	Choose one day to read and practice more on Chinese characters.
			4	Going online and downloading additional resources and websites helps in studying Chinese characters.
			5	Always attend classes of this course. Always refer to all the materials provided by the instructor.
			6	Always change learning environments to avoid disturbing at home.
			7	Always participate in class discussions and activities.
			8	Stay connected with the instructor, do all the activities/quizzes/tasks given, and focus on class.
Emotional	6	75.00	1	Perceive Mandarin class is a fun class.
			2	Have enthusiasm in doing every task and assignment.
			3	Less getting involved in class.
			4	Always keep up the momentum and interest.
			5	Feel good about learning a new language.
			6	Always motivated each other in WhatsApp group chat.
Cognitive	5	62.50	1	Using virtual flashcards to memorise the shape and meanings of Chinese characters.
			2	Understand and capture all the by studying diligently using the material provided by the lecturer.
			3	Being able to memorise it but needing to commit to it until it stays permanent in mind.
			4.	Apply to diversify ways of learning, such as watching Chinese movies, etc.
			5	Remember Chinese characters by writing them repeatedly.
Agentic	1	12.50	1	Ask instructor questions when having doubt.

As shown in Figure 2, it was discovered that language elements (Chinese character, phonetic and grammatical) of MFL language were not the main challenges in online flipped MFL learning. However, the top three challenges were 'lack of self-efficacy' (100%), 'social interaction issues' (87.5%) and 'time management' (75%). The

participants faced fewer problems with 'language elements' (62.5%), 'emotional problems' (62.5%), and 'physical environment constraints/ technical difficulties' (50%).

Figure 2 Learning challenges in online flipped MFL learning (see online version for colours)



In correspondence with the main code of online flipped MFL learning challenges, the sub-codes of behavioural, emotional, cognitive, and agentic engagement were created. In Table 6, behavioural engagement was the most engaging aspect (100%), and agentic engagement (12.5%) was the lowest engagement in online flipped MFL learning. These qualitative results are consistent with the quantitative findings presented earlier in this paper.

4.2.1 Online flipped MFL learning challenges

4.2.1.1 Lack of self-efficacy

Self-efficacy in this study refers to self-discipline, self-motivation, and self-regulation. Students found it difficult to 'being self-regulated as a successful learner should', 'keep motivated' and 'follow the schedule and study regularly'.

> "I would say, having to keep up the momentum while doing the revision and other subject's assignments was very challenging." (Participant 6)
>
> "Discipline is the most challenging thing. I want to study, but sometimes I am not focused and feel lazy." (Participant 4)
>
> "Sometimes, it is difficult for me to prepare before Webex class [synchronous class]." (Participant 5)

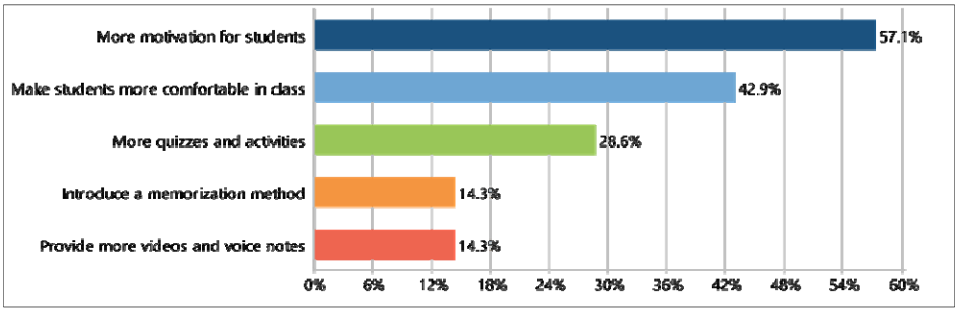
On top of these lack of self-efficacy challenges, there were some recommendations for online instructors to support online flipped MFL learning, as presented in Figure 3.

57.1% of the students asked for 'more motivation for students', and 42.9% requested 'make students more comfortable in class'. The following are excerpts from the recommendations for online instructors to support online flipped MFL learning:

> "Teachers can try or motivate students to always practising and talk using Mandarin." (Participant 7)
>
> "To always being understanding student's situation." (Participant 6)

These are considered affective aspect that online instructors need to be covered other than the course content design, which is 'more quizzes and activities' (28.6%), 'introduce a memorisation method' (14.3%) and 'provide more videos and voice notes' (14.3%).

Figure 3 Recommendations for online instructors to support online flipped MFL learning (see online version for colours)



4.2.1.2 Social interaction issues

Students reported that they were having social interaction issues. They have problems in 'finding 'partners' to work and practice with', 'keeping in touch with the class', and 'keeping in touch with the teacher, e.g., turning up at the weekly synchronous class sessions'.

Students were conveyed that they were able to interact with each other through many platforms, such as through instant messaging tools (Whatsapp/Telegram), interact with those from the same faculty and course, interact in synchronous class (Webex live class/chatbox), interact through online collaboration tools, such as Padlet and interact through an asynchronous class platform (LMS). However, they still faced some problems with doing so.

One student stated that:

> "I wish [I] could have participated more during classes and interacted with the class member as well as the lecturer [instructor]." (Participant 2)

4.2.1.3 Time management

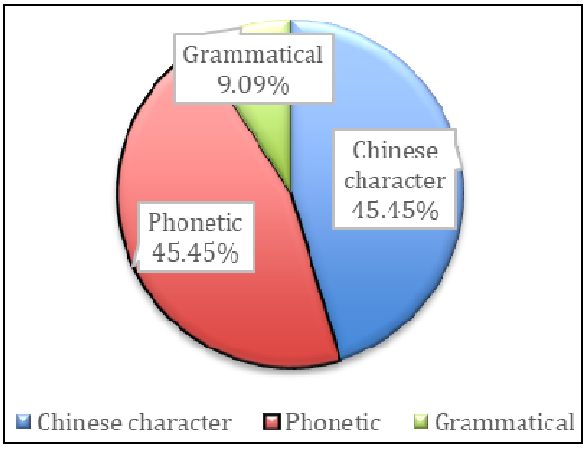
Students found 'keeping the assessment deadlines', 'sticking to the pair-work or group-work schedule', and 'finding a commonly available time to work with a partner' as learning challenges in terms of time management. As noted by one of the students:

> "The most challenging thing is the time." (Participant 7)

4.2.1.4 Language elements

This study's Mandarin language elements refer to Chinese characters, phonetics and grammatical. Figure 4 shows that most students have problems with Chinese characters (45.45%) and phonetics (45.45%), and they have fewer issues with grammatical (9.09%).

Figure 4 Challenges in Mandarin language elements (see online version for colours)



There was one of the students expressed that:

> "Chinese characters are so confusing because got different shapes and meanings." (Participant 1)

4.2.1.5 Emotional problems

For the 'emotional problems', there were situations such as the students feeling stress, fear of being left behind, and feeling isolated in online flipped MFL learning.

> "Sometimes, I feel fear of being left behind." (Participant 3)

> "The most challenging is I can't see madam face to face. I'm a person that if I don't understand something, I need face to face explanation so that I can ask many questions to madam. It is hard for me to understand myself." (Participant 8)

4.2.1.6 Physical environment constraints/ technical difficulties

Some of the students have impropriated physical environment constraints at home. Some students also indicated that they faced technical difficulties such as getting online, going into the synchronous class (Webex), or getting online tools (Voice Recorder, Padlet).

> "Surrounding disturbances such as family members making noise and the mind is difficult to focus……" (Participant 5)

4.2.2 Dimension of engagement

4.2.2.1 Behavioural engagement

All eight participants were engaged behaviourally in online flipped MFL learning. The students pointed out that the well-planned instructional design and preparation of this online flipped MFL course contributed to the high behavioural engagement. These are some positive feedbacks extracted from the qualitative open-ended question survey:

> "Quizzes given is really enjoyable although the question is hard but it helps to cultivate love towards this subject." (Participant 8)

> "Everything that teacher [instructor] did was great enough and very helpful for students that are learning languages." (Participant 6)
>
> "For me, the way of teacher [instructor] taught in the class and all the materials given are enough and very useful. It helps me learn a new language easily and the materials are very understandable." (Participant 7)

The qualitative results further support behavioural engagement as the most dominant student engagement in online MFL flipped learning.

> "Choose 1 day, for example, on Saturday, to read and practice more Mandarin." (Participant 7)
>
> "I did a lot of exercises to ensure I remember each of them. I don't deny this subject is a bit hard, especially in recognizing the Chinese character, so to counter my weakness, I keep writing the Chinese character until I can recognize each of them." (Participant 2)

4.2.2.2 Emotional engagement

Six of the students informed that they were emotionally engaged in online MFL flipped learning. Emotional engagement is the second most crucial dimension of MFL students responding to online flipped MFL learning. They have positive and negative emotional engagement during the online flipped MDL learning:

> "Every single exercise, notes and online quiz were very helpful and interesting to do. I had so much fun doing it." (Participant 6)
>
> "Although we never met physically, everyone was very helpful and friendly." (Participant 6)
>
> "Sometimes, I feel fear of being left behind." (Participant 2)
>
> "The most challenging is I can't see madam [instructor] face to face. I'm a person that if I don't understand something, I need face to face explanation so that I can ask many questions to madam [instructor]. It is hard for me to understand by myself." (Participant 8)

4.2.2.3 Cognitive engagement

To grasp the online flipped MFL classroom concepts, five students attempted to connect the new knowledge with their prior knowledge, put diverse ideas together, make sense of them, and develop their examples. The following excerpts show cognitive engagement:

> "Diversify ways of learning. Watching Chinese movies, enjoying Chinese songs, and practice talking to the mirror or talking with my Chinese friend. All that can improve myself in this course." (Participant 8)
>
> "Am trying hard to memorize it [Chinese characters] but needing to commit to it until it stays permanent in my mind." (Participant 3)

4.2.2.4 Agentic engagement

Students had less participation in agentic engagement in online MFL flipped learning. There was only one participant who mentioned that "I always ask the teacher [instructor] something that I do not understand. I always ask my friend and check the notes in eleap [asynchronous class]" (Participant 1).

However, there were agentic engagements involved when students tried to make whatever they learned as attractive as possible and adjust whatever they learned to learn as much as possible. Some indicated that they managed to develop new learning behaviours or fully online learning strategies, especially in self-directed and self-regulated learning.

> "Keep in touch with the lecturer [instructor], do all the activities/quiz/tasks given and focus in class. Apart from that, I also listened to Chinese songs so that I could keep my interest in the course." (Participant 4)

5 Discussion

Student engagement is essential, especially in an online foreign language learning environment, and online flipped MFL learning is still in its early stages. The present study examines how students respond to online flipped MFL learning regarding their behavioural, emotional, cognitive and agentic engagement. It also explores MFL students' responses to language learning challenges provided via online flipped learning.

Even though the various language learning challenges provided in online MFL flipped learning, most of the students assessed the approach as moderately agreed in successfully engaging them in behavioural, emotional, cognitive and agentic engagement. Thus, the findings of the mixed methods confirmed previous studies showing that the students found online flipped MFL learning to be an exciting approach and persevered to get used to it (Jia et al., 2021; Heiss and Oxley, 2021; Hew et al., 2020; Latorre-Cosculluela et al., 2021; Stöhr et al., 2020; Tang et al., 2020; Tseng et al., 2018; Wang, 2017).

To perform successfully in the learning process, MFL students must undergo three processes: overcome difficulties in the Mandarin language elements, learn MFL in an online environment, and become skilled at the flipped language learning approach.

Qualitative evidence surprisingly shows that the Mandarin language elements (Chinese characters, phonetics and grammatical) were not the primary challenging process of online flipped MFL learning. However, learning MFL in an online environment and adapting to the flipped language learning approach were considered the most complicated process for MFL students. The evidence resulted in the top three challenges, which are 'lack of self-efficacy (self-discipline, self-motivation and self-regulation)', 'social interaction issues' and 'time management'. Other minor issues are 'emotional problems' and 'learning environment constraints/technical difficulties'. The finding is in line with Gao's (2020) study, which found that the new issues for learning Chinese characters in online education mainly were caused by technical, physical, and time constraints and their effects on students' mental health and wellbeing.

For the present study, MFL students were expected to master the Chinese characters; they cannot type but must scan and submit their Chinese character writing for exercises and assessments. At the same time, students must acquire proper phonetics and grammatical. As shown in this study's findings, most students struggle with Chinese characters and phonetics, and these results align with Gao (2020) and Lam and Kuan (2019). Nonetheless, the MFL language elements perceived as less challenging can be linked to high behavioural engagement in online flipped MFL learning.

The mixed-methods findings reveal that MFL students have behavioural engagement as the highest dimension of student engagement, followed by emotional engagement,

cognitive engagement, and agentic engagement in online flipped MFL learning. The high behavioural engagement in this study is consistent with Adams et al. (2021), who conducted the study in the online setting, and Bond's (2020) study in flipped learning but contrasted with Steen-Utheim and Foldnes's (2018) study, which found that behavioural engagement is not dominant in the offline setting.

In the present study, several behavioural engagements were reported. Students always tried hard and made an effort to do well in online flipped MFL learning. They paid attention, listened carefully, worked hard in every class, tried to stay connected with the instructor, focused on the online class, attended class, and participated in-class activities.

MFL students were well explained about the online flipped learning approach at the beginning of the class, and all the online flipped course materials were carefully designed to suit the need for the flipped learning approach. Based on the qualitative findings, some students reported they were satisfied with the flipped course learning design and could overcome online flipped language learning obstacles in MFL online flipped learning by following the course learning design.

The well-planned instructional design and preparation of this MFL course somehow proved to contribute to the high behavioural engagement in this study. This result supports the findings of Ma et al. (2015) and Adams et al. (2021). They discovered that instructors' instructional design and preparation significantly impacted the students' behavioural engagement in online learning.

The high behavioural engagement also somehow shows that most students had higher levels of resilience to cope better when facing adversity, and resilience acted as a protective factor against stress, depression, and anxiety of negative psychology (Abai and Madihie, 2021). They were students who indicated that they could successfully emerge new learning behaviours or fully online learning strategies. Those strategies include asking the instructor, friends, and course mates, having self-regulation, self-motivation, and looking for additional learning resources, such as songs and movies. This finding is consistent with Sun (2014), where students successfully developed self-directed and self-regulated learning.

Emotional engagement is the second most crucial dimension of MFL students responding to online flipped MFL learning. This outcome contradicts Jamaludin and Osman's (2014) finding, which found that students were more emotionally engaged with the information offered than behavioural engagement in the conventional flipped classroom. The finding that emotional engagement is the second greatest dimension of student engagement might be connected to the explanation indicated in qualitative results where students feel stressed, isolated, and require face-to-face interaction in online flipped MFL learning. They also responded that they do feel not good and are less involved in the class in quantitative findings. This situation is similar to the study conducted by Gao (2020) and Dixson (2015).

The negative responses of emotional engagement reported in the mixed-methods findings in online flipped MFL learning, somehow confirmed by Gao (2020), as one of the challenges is learners' mental health and wellbeing. Dixson (2015) also supported these ideas and mentioned that students were expected to have such emotional problems when they were in an online learning environment. Gao (2020) stated that these emotional problems will have reduced their motivation to continue studying the Mandarin language.

In spite of that, consistent with the literature, this study found that most students were positively engaged in emotional engagement, and demonstrated positive emotional

responses (Adams et al., 2021; Bond, 2020; Fredricks et al., 2004; Redmond et al., 2018; Reeve et al., 2019; Wimpenny and Savin-Baden, 2013; Yang, 2011). Most of them felt enjoyable when they learned new things in the online flipped MFL learning and were interested, fun, and emotionally engaged in the class. The students also disclosed that they perceive Mandarin class as fun, and they reported enthusiasm in doing every task and assignment. They also remarked that they felt good about learning a new language.

This study, similar to Jamaludin and Osman's (2014) finding, found slightly less cognitive and agentic engagement. It can probably connect to the significant online flipped language learning challenges: 'lack of self-efficacy (self-discipline, self-motivation and self-regulation)'. At the same time, some students also informed that they had a problem developing surface and deep cognitive engagement when overcoming the learning challenges in MFL language elements (Chinese characters, phonetics and grammatical).

As reported in the mixed-methods findings, the students found it hard to relate new knowledge with prior knowledge in MFL learning, especially in learning Chinese characters because it has different shapes and sounds. They also pointed out that they have issues making up their examples to understand the vital concept in MFL language elements. This study supports the studies of Gao (2020) and Lam and Kuan (2019) findings that students strived for Chinese characters and phonetics aspects of the language.

Nevertheless, MFL students still worked hard to be cognitively engaged by absorbing what they were being taught for cognitive engagement in mixed-methods findings. They incorporate metacognitive and self-regulation strategies after being behaviourally and emotionally engaged. They tried hard to overcome challenges for MFL language elements, which might be why the MFL language elements resulted in not being the primary learning challenges in online flipped MFL learning.

Students have reported the lowest participation in agentic engagement in online MFL flipped learning. The finding is the same as Jamaludin and Osman's (2014) study, which found it difficult to provide input and ask for clarification or explanation to personalise their learning experience. The result can relate to the qualitative findings where students 'lack of self-efficacy (self-discipline, self-motivation and self-regulation)', 'social interaction issues', and have obstacles in 'language elements (Chinese characters, phonetics and grammatical)'. They also lacked the motivation to preview the learning materials before synchronous class and needed face-to-face interaction to ask questions. At the same time, the instructor's teaching approach somehow influenced this result. The qualitative results revealed that students expected more autonomy-supportive teaching. This finding was also reported by Reeve and Shin (2020) who emphasised the importance of autonomy-supportive teaching in supporting students' agentic engagement. Examples of autonomy-supportive teaching are paying more attention to students' interests, goals, and needs and being responsive to students' feedback and suggestions.

However, the mixed method findings show agentic engagements involved when students tried to make whatever they learned as enjoyable as possible and adjust whatever they are learning to learn as much as possible. Some indicated that they managed to develop new learning behaviours or fully online learning strategies, especially in self-directed and self-regulated learning. This finding is consistent with Sun (2014), where students successfully developed self-directed and self-regulated learning.

Overall, the quantitative findings offer valuable insights into how students respond to online flipped MFL learning regarding behavioural, emotional, cognitive and agentic

engagement. The qualitative results demonstrated the significant factors for MFL students' language learning challenges in online flipped learning. The study's outcomes reveal that the online flipped learning approach successfully engaged the students. Students have meaningful engagement in online flipped learning, which can engage students in completing their learning activities and putting more time and focus into a deep comprehension of the topic.

Since all of the eight participants in the qualitative part of the study expressed their higher level of students engagement in terms of behavioural, emotional, cognitive, and agentic engagement have obtained good scores in this MFL course, it somehow confirmed the findings of Astin (1984), Saeed and Zyngier (2012) and Reeve et al. (2019). They found that engaged students acquire superior learning outcomes and affirm the success of the online flipped learning approach.

According to the suggestions for online flipped MFL learning instructors, it is interesting that students expect more affective aspects compared to other aspects in online flipped learning, which are 'more motivation for students' and 'make students more comfortable in class'. It supports the study of Steen-Utheim and Foldnes (2018), Tang et al. (2020), Thornberg et al. (2020) and Brandon (2020). They mentioned that students could feel more at ease and more willing to be committed to online flipped learning if the online instructors are more approachable, considerate, and easy to communicate with. This result mainly reflects those of Thornberg et al. (2020). They found that if the instructor can have better professional values and ethical teaching principles, such as compassion, justice, caring, sincerity, and empathy, it can increase 'teacher being' and further enhance overall student engagement.

6 Conclusions

This study has found that the online flipped classroom approach effectively engages MFL students in behavioural, emotional, cognitive and agentic engagement. Even though lack of self-efficacy was reported as the main challenge in online flipped MFL learning, students can overcome any learning challenges, adapt to their designed online learning strategies, such as self-directed and self-regulated learning, and obtain better learning outcomes. This is reinforced by Stöhr et al. (2020) and Latorre-Cosculluela et al. (2021). They found that the online flipped approach best suits the context and specific behaviour as students and instructors commit and take proactive responsibility.

Since cognitive engagement and agentic engagement are considered lacking compared to behavioural engagement and emotional engagement in online flipped MFL learning, different active learning activities for pre-class and in-class may be incorporated to increase students' involvement in the learning context. The cognitive and agentic activities are related to new knowledge to prior knowledge, makeup examples to understand specific complex MFL language elements, letting the instructor know what students need and want, expressing students' preferences and opinions, and encouraging students to ask questions to help them learn. The students can engage accordingly if the online instructor design, provide an interactive online learning environment, and take account of affective aspects in designing online flipped learning environments (Dewaele and Li, 2020; Kralova et al., 2022; Thornberg et al., 2020; Yen, 2020).

There is some limitation to this study. First is the use of survey designs. One disadvantage of survey design is that feedback is biased and self-reported, examining the idea of each participant's perspective rather than objective, measurable outcomes (Miller and Salkind, 2002). The feedback collected from the questionnaire was those of MFL students on their personal experience in online flipped MFL learning classes.

Another disadvantage of survey research is that it often uses standardised responses to constrain the type and complexity of responses (Miller and Salkind, 2002). The survey in this study uses standardised answers for the quantitative part of the study. In contrast, the qualitative part of the study was used to collect additional details and provide deeper analysis and insight into the students' response to online flipped MFL learning in terms of behavioural, emotional, cognitive and agentic engagement.

Second, I was both a course instructor and an educational researcher. Qualitative data may not be as trustworthy as quantitative research with proven validity and reliability metrics. However, when the qualitative data in this study was examined, I compared individual responses to the greater whole to ensure that the specific cases and themes were chosen as representatives.

Third, for the characteristic of the students, convenience sampling was used for the quantitative part, and purposive sampling was used for the qualitative part; thus, the findings cannot be generalised to reflect a larger group of fully online flipped MFL learners. However, the present study was not meant to be generalisable to other populations. Instead, this study aims to understand how MFL students engage in the online flipped learning environment in terms of their behavioural, emotional, cognitive and agentic engagement. At the same time, this study also aims to determine how they respond to language learning challenges for improving online flipped student engagement and learning among the sample group of online students at the study location.

This study has significant pedagogical implications for teaching and learning MFL using an online flipped approach. It contributes to understanding the engagements fostered for online flipped MFL classrooms to improve active learning and provides guidelines for designing an engaging online flipped MFL course. Results from this study also could be employed to develop a course resource to accommodate students' diverse learning preferences in online flipped MFL classrooms to contribute to MFL instructors or related educators. As a policy contribution, the findings of this study could be utilised to offer various solutions for engaging students so that no students are left behind in the online flipped learning process.

Future research in online flipped MFL learning can focus on acquiring MFL learning effectively in an online environment and identifying alternatives for supporting MFL students in adapting to the flipped language learning approach. The affective aspects of student engagement among MFL learners also could be addressed. It is also suggested that researchers look at how to develop online flipped learning environments that allow students to connect in several ways to promote cognitive and agentic engagement.

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Appendix 1

Reeve's (2013) quantitative structured questionnaire

This instrument used a seven-point Likert scale that ranges from 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = agree to 7 = strongly agree.

Behavioural engagement

Q1 When I am in the synchronous class, I listen very carefully.

Q2 I pay attention to synchronous class and asynchronous class.

Q3 I try hard to do well in Mandarin class (synchronous class and asynchronous class).

Q4 In Mandarin class (synchronous class and asynchronous class), I work as hard as I can.

Q5 When I am in Mandarin class (synchronous class and asynchronous class), I participate in every discussion, quiz and activity.

Agentic engagement

Q6 I let my instructor know what I need and want.

Q7 I let my instructor know what I am interested in.

Q8 During Mandarin class (synchronous class and asynchronous class), I express my preferences and opinions.

Q9 During Mandarin class (synchronous class and asynchronous class), I ask questions to help me learn.

Q10 When I need something in this class, I will ask the instructor for it.

Q11 I adjust whatever we are learning so I can learn as much as possible.

Q12 I try to make whatever we are learning as interesting as possible.

Cognitive engagement

Q13 When I study for Mandarin class (synchronous class and asynchronous class), I try to connect what I am learning with my own experiences.

Q14 I try to make all the different ideas fit together and make sense when I study for Mandarin class (synchronous class and asynchronous class).

Q15 When doing work for Mandarin class (synchronous class and asynchronous class), I try to relate what I am learning to what I already know.

Q16 I make up my own examples to help me understand the important concept I am studying for Mandarin class (synchronous class and asynchronous class).

Emotional engagement

Q17 When we work on something in Mandarin class (synchronous class and asynchronous class), I feel interested.

Q18 Mandarin class (synchronous class and asynchronous class) is fun.

Q19 I enjoy learning new things in Mandarin class (synchronous class and asynchronous class).

Q20 When I am in Mandarin class (synchronous class and asynchronous class), I feel good.

Q21 When we work on something in Mandarin class (synchronous class and asynchronous class), I get involved.

Appendix 2

Sun's (2014) 13 open-ended questions survey

These are all open-ended questions. Please provide as much detail as possible in your responses to the following questions.

Q1 Without the benefit of a traditional classroom, how did you keep engaging in the course?

Q2 Without the benefit of a traditional classroom, how did you interact with other class members?

Q3 Without the benefit of a traditional classroom, how did you pair up and team up for collaborative work, e.g., the paired oral presentation?

Q4 Without the benefit of a traditional classroom, how did you socialise in an online class?

Q5 What is the most challenging thing about online language learning, in your experience?

Q6 What other difficulties did you encounter during the course? (Tick as many items below as were applicable to you)

- a Technical difficulties, e.g., getting online, or going into the synchronous class (Webex), or getting online tools to work (e.g., Voice Recorder, Padlet), etc.
- b Finding 'partners' to work and practice with.
- c Finding a common available time to work with a partner.
- d Sticking to the pair-work or group-work schedule.
- e Keeping in touch with the class.
- f Keeping in touch with the teacher, e.g., turning up at the weekly synchronous class sessions.
- g Keeping interested in the course.
- h Keeping motivated.
- i Following the schedule and study regularly.
- j Keeping the assessment deadlines.
- k Being self-regulated as a successful learner should.
- l Others. Please state:

Q7 In the new environment of learning (as opposed to traditional classroom learning), what changes and what effort did you have to make to adapt?

Q8 What was successful and what was not in your new effort/methods?

Q9 What more could you have done to achieve a better result?

Q10 Did you notice any new ways/models of learning by other class members?

Q11 In your opinion, what are the 'best practices/ways' in online language learning?

Q12 How can online teachers better facilitate and promote these new practices/ways of learning?

Q13 Any other comment?