'CLASSKICK' an interactive online app to Support Students' Learning: A case study on Mandarin as a foreign learning

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Abstract. Technology evolution now allows for many things. However, it is hard to keep students engaged without a teacher's physical presence contact. Educators may use interactive virtual applications to track students' progress and giving feedback to keep them engaged. Due to the rise of online learning tools, students have an opportunity for personalised instruction and tailored to their specific needs. Thus, this article presents \textit{Classkick}, an interactive web and mobile app supporting differentiated Mandarin instruction in higher education. A quasi-experiment was used to examine how it influences students' knowledge and the teacher's teaching practice. \textit{Classkick} enhanced the quality of \textit{Classkick} learning and changed the way students learn. \textit{Classkick} is a potential app for differentiated instruction. It helps teachers to differentiate instruction for individual need. However, students and teacher need to adjust self-concept to be more effective. The study found that \textit{Classkick} can be used to render integrated instruction that can minimise distraction. It showed that technology integrated lessons have a higher impact on student learning than traditional methods.

Keyword: Interactive Virtual Tool, \textit{Classkick}; Mandarin Learning, Differentiated Instruction

1. Introduction

Currently, technology-based teaching becomes the trend to engage learning, and it has been used for various learning activities. \cite{1} found that advanced online technology has effectively improved most reader profiles. It has helped drive technology apps integration as practical virtual teaching tools in higher education. Technology apps integration offered a unique approach to facilitating the learning and teaching of Chinese languages, which currently are urged to accommodate innovation in pedagogy. Each technological tool could meet educational requirements based on its functional design\cite{2}. The online invention proffers educators with various alternatives to differentiate instruction to achieve learning goals\cite{3}. Besides, virtual learning tools support students' cognitive, motivational, emotional, and social outlook \cite{4}. Furthermore, communication, video conferencing and digital technologies provide a medium for effective communication and research collaboration support effective communication and professional
activities in education [5].

However, educators need to continuous monitoring and give formative assessment[6] to ensure its success. But studies regarding how online instruction efficacy [7] can be accomplished differently [8] at higher education and Mandarin subject are scarce. Besides, [9] found that teachers across different countries lack adapting their instruction to meet each student's needs.

Thus, in this study, Classkick (Classkick.com), a web-based and app-based app selected as a learning tool to differentiate instruction in suiting students' learning needs. This leading virtual app shows teachers what students think to support non-native students in pursuing Mandarin based on differentiated instruction. The study was conducted for a semester in a Malaysia higher education. The research is primarily focused on its usability and accessibility to teacher-student interaction. It explores the extent to which interactive virtual apps addressing students' learning needs and produce extended learning experiences. Besides polishing the educator's pedagogical to differentiate instruction, as stated in the research question below: To what extent is Classkick used to offer differentiated instruction that affects students' learning and teacher's pedagogical knowledge?

2. Literature Review

2.1 Online Platform and Apps

There are lots of online platform and apps which have the potential in offering differentiated instruction. Typically, the virtual learning platform provides rich content, varied types of learning content and feature sets. Multi-level and multi-method communication need to be made in online platforms to improve learning quality and stimulate students' curiosity and confidence in content learning. The researchers need to meet two fundamental needs while developing an online platform. They need theoretical models and methodologies and the necessity of specific tools for analysing and searching for available Web-based resources [10].

Next, a study examines the benefit of online real-time immersive communication on Chinese language learners' speaking ability. [11] found it has beneficial effects on language learning. The results point toward growth in speaking skills and overall positive learner experiences in immersive online learning. Learners' input supports the online program's design and planning and its technology use but recommends future workload reduction.

A text-based online communicative activity designed for learners of Chinese as a foreign language showed that both approaches: promoting self-study; retention; transfer of Mandarin knowledge; peer-interaction; acquisition of Mandarin via communication, and; fostering interest in participating in the activity successfully bridged classroom learning with out-of-class learning and the formation of a sense of belonging in a learning community among the learners[12].

In other words, an internet-based learning platform provides convenience in learning a second language and second language acquisition. For example, [13] investigates the effectiveness of an online application in helping beginning-level Chinese learners improve their perception of Mandarin Chinese tones. The scholars found no statistically significant difference between the experiment and control groups in their tone perception performance. However, the experimental group showed a positive trend in improving their perception of those tones, which posed more difficulty than others. The scholars proposed that online tone practice is worthwhile in a Chinese language class but might fit better into the curriculum as external assignments. However, it is different from face to face of classroom learning. The students and teachers take time to adapt and become accustomed to it. Besides the positive sides, students also encounter problems like technology, education, adaptability, and time management [14].

The implementation of online learning presents pedagogical challenges to find the best method to teach a language online in either synchronous or asynchronous modes. It is the responsibility of the educator to capture and sustain their students' interest in learning online. A classroom full of technology is only an effective combination with good pedagogical design. And differentiation is one of the instructional strategies which can be seen as innovative practices for better learning in the 21st Century. Thus, the Classkick app is chosen as it enables the teacher to differentiate instruction through the four
ways: content, process, product, and learning environment, as suggested by Tomlinson (2019). Classkick is a free app that students work on and get help instantly from their teachers and peers. It also allows teachers to create and share assignments, monitor students, and give feedback in real-time as students work from their smartphones or computers, as shown in the figure below.

![Teacher monitors the whole class](image1)
![Teacher guides a particular student](image2)

**Figure 1:** Snapshot on the use of Classkick

### 2.2 Differentiated Approach

What is a differentiated approach which can be offered through the use of online platform and apps? Differentiated instruction, also known as differentiated learning, is a teaching philosophy that considers all students' needs either in face to face or online lesson. [15] discovered that students could find their learning styles and optimise their learning through differentiated instruction.

Differentiation means tailoring instruction to meet individual needs. Whether teachers differentiate content, process, products, or the learning environment, the use of ongoing assessment and flexible grouping makes this a successful approach to instruction.

"With the advent of powerful online learning tools, . . . students might be able to receive instruction that's truly individualised to their own needs -- differentiation on steroids." [28]. It shows that technology has opened the doors for teachers to provide differentiated instruction without feeling overwhelmed.

It is proven when [2] found that technology-enhanced Chinese teaching and learning motivates and engages students. Also, educators could maximise the potential of all kinds of technologies to achieve targeted objectives. They tended to adopt more than one technology to help teach and learn Chinese. The most widely used technologies were mobile apps, followed by Web 2.0 technologies and web conferencing technologies. Other technologies include Massive Open Online Courses, virtual reality, and interactive whiteboard etc. For example, [16] determined that the WeChat recording tool can help instruct mixed classes in study abroad, despite little technical difficulties. It created opportunities for learners to engage in different oral learning tasks, helped the curriculum stay on track, and enabled instructors to provide differentiated and timely feedback. In short, there are various technology apps with unique features and functionality online to assist online learning.

Recently, Mandarin educators focused on using or developing apps and other online tools to differentiate the curriculum targeted goal. The studies showed virtual technology tools are promising applications to deal with students' unique learning preferences virtually. For example, [17] have developed Hanzi apps to help students learning Chinese character based on instructor and students' active participation. The finding shows that the student needs to adopt a self-learning concept to be more effective. The students can learn anytime, anywhere depending on their more flexible availability. It encourages the student to learn in a much fun way. The aspect of differentiated instruction shows that differentiation of context and technology has created students' learning sites to converse virtually.

The other study showed that there were audio, graphics and text elements that must be integrated
into the mobile learning framework, and audio features help in listening skills while text elements help in speaking skills as well as other features such as learning anywhere and anytime, easy to use, navigation, additional resources for related information are provided, directory and help button [18].

But regarding the online differentiated instruction practice in higher education, [19] found it is challenging to realise in large classes. Instructors need to have a better understanding of the strategies and how to implement them. Another differentiated aspect highlighted by [8] is the need for a teacher to know several teaching approaches for effective instruction. Most students want to learn as much and as often as they can. A teacher's response to various readiness level reflects both professionalism and respect. The study found that more training and guidance are needed to improve poorly conceived ideas and enhance classroom performance. Next, [20] found that differentiation instruction was positively associated with teachers' efficacy and the perception of teachers' efficacy. Teacher effectiveness is a crucial dimension in implementing differentiation, regardless of the teacher's level or content (elementary, middle, or high school). The scholars stressed that continuing studies on differentiation development could reveal the link between differentiation and increased online teachers' effectiveness.

Educators need to consider essential elements while integrating advanced technology in the learning process to implement effective online learning. [21] found that audio, graphics, and text elements must be integrated into the mobile learning framework. They discovered that audio features help in listening skills. In contrast, text elements help speaking abilities. Other characteristics such as learning anywhere and anytime, easy to use, navigation, additional resources for related information are provided, directory and help button. To sum up, technology advanced the ability to assist educators in differentiated instruction to address students' learning experiences.

Another way to differentiate the class is by noting what learning styles students have. Humans learn in visual, auditory, tactile, or kinaesthetic ways [22]. This model enables students to identify their preferred learning style. It is claimed that students can maximise their learning by focusing on the mode that benefits them the most. An aural learner tends to repeat information verbally. The learner learns better by listening and could process verbal details more effectively. A print-oriented learner prefers notes and is interested in writing, reading, and quickly reflecting on what they have read. Visual learners frequently learn better by watching illustrations such as pictures, graphs, and activities. They remember well for the recollection of events. The multiple cues of images, sound, and actions express ideas or activities in context through visual media greatly enhanced a visual learner's comprehension. The haptic learners have a good sense of touch. They are more interested in hands-on applications that ask for the learner's involvement. To sum up, every student is different, and they learn differently.

Both new resources and new technologies will present challenges. However, with proper planning and implementation, these technologies can decrease educators' overall workload and increase access to educational materials, especially in implementing differentiated instruction. To conclude, previous academic research has criticised differentiated instruction. Still, several studies that used appropriate research designs found evidence that differentiated instruction helps the learner identify his learning style and improve learning [23].

2.3 SAMR model: A framework that orders strategies for classroom technology implementation

Technology integration in learning introduces a set of new variables in the context as well as adds complexity. The SAMR model is essentially a planning tool that helps design better classroom technology implementation activities for students. Since the nature of technology is to keep changing and developing [5], so [24] suggested to cope the challenge by employing SAMR [29] (Substitution, Augmentation, Modification, and Redefinition) model. The four parts of the model try to shift technology to the next level to enhance education quality [6]. It guides the teacher to integrate technology on each step of the model comprising substitution, augmentation, modification, and redefinition [7]. The model, which functions as a learning tool [13], contains four-level as follows.

1. Substitution: in this level, technology substitutes the previous tools without changing their functions.
2. Augmentation: in this level, technology is used to replace the earlier tools by improving operations.
3. Modification: in this level, technology possible changes the works to be better.
4. Redefinition: in this level, technology creates something extraordinary

2.4 REACH: A Framework for Differentiating Classroom Instruction

Besides using the SAMR model, which guides as a framework in ordering strategies for classroom technology implementation, understanding the framework that can be utilised in differentiated instruction is vital. This framework shed light on how to apply differentiated instruction practically. On top of that, in using the differentiated instruction approach, [25] offer a path to guide implementation. The REACH steps are (a) reflect on what you want and can do, (b) evaluate current curriculum, (c) analyse learner data, (d) design research-based lessons, and (e) focus on the data and results. This REACH framework is also efficient in giving feasible steps in implementing differentiated instruction.

3. Research Methodology

This study's research question is to look into the extent to which Classkick can offer differentiated instruction, which affects students' learning and teacher's pedagogical knowledge. The instruments of this experimental study are questionnaire and pre-and post-test. In this study, two types of pre-test a post-test was conducted to determine their language performance. One of them is a set of 50 language questions that cover all the topics learned. Another one is a set of questions to explore students' learning experiences. It includes ten questions: Language (3 items), teacher (1 item), Tasks Given (2 items), Interest (3 items) and Confidence (2 items). A total of 35 different ethnic groups among UMT students were chosen through purposive sampling to participate as respondents. The data analysed using descriptive and inferential statistics, including frequency, percentage, mean, standard deviation and pair t-test. This study's expected result is to determine the extent of Classkick in offering differentiated instruction that affects students' learning and teacher's pedagogical knowledge. There are two types of questionnaires: language test and students' view on the learning experience, and three research purposes, as shown in Table 1 below.

| INSTRUMENT            | PURPOSE                                               |
|-----------------------|-------------------------------------------------------|
| 1 Language Test       | To investigate the extent of the use of Classkick, which affects students' learning. |
| 2 Learning Experience | To investigate the extent of the use of Classkick, which affects students' learning. |
| 3 Using the REACH framework | To investigate the extent of the use of Classkick, which affects pedagogical knowledge. |

4. Result

4.1 Demography Information

This study involved 35 non-native Mandarin learners as respondents. There 20 students from Mandarin level II(M2) and 15 students from level III(M3).

4.2 Students Performance

Students' result shows in Table 2. The quantitative results show Mandarin II students' results (mean: 85.5, n:20) were better than their pre-test results (mean: 52.2, n:20). The result Mandarin level III student shows students' results (mean:84.4, n:15) were higher than their pre-test results (mean:77.3, n:15).

| INSTRUMENT     | Mean   | N   | Std. Deviation | Std. Error Mean |
|----------------|--------|-----|----------------|-----------------|
| M2 result_2_pre | 52.2000| 20  | 21.72459       | 4.85777         |
| M2 result_2_final | 86.5000| 20  | 6.77068        | 1.51397         |
| M3 result_3_pre | 77.3333| 15  | 13.40931       | 3.46227         |
| M3 result_3_final | 84.4000| 15  | 6.37854        | 1.64093         |
The result of the t-test regarding their language achievement is displayed in table 3. Mandarin II students’ result shows improvement. The t-test result: t: -7.101, df:19, sig.value:.000<.05. Hence, the difference was significant. The students of level have performed better in the final test. The t-test for level 3, the difference was significant with t: -2.530, df:14, sig.value:.024<.05. Hence, the level 3 students have performed better in their final test.

Table 3: T-test analysis

| Paired Differences       | t     | df | Sig. (2-tailed) |
|--------------------------|-------|----|-----------------|
| M2 result_2_pre - result_2_final |       |    |                 |
| Mean                     | -34.30000 | 21.60190 | 4.83033 | -44.41000 | -24.19000 | -7.101 | 19 | .000 |
| M3 result_3_pre - result_3_final |       |    |                 |
| Mean                     | -7.06667 | 10.81974 | 2.79364 | -13.05844 | -1.07490 | -2.530 | 14 | .024 |

Overall, all the students are improving in their language grades. The Mandarin II result is increased from 52.2 (pre-test) to 86.5 5 (post-test) shown in Table 1. Students of Mandarin III also shows an increment from 77.3 (pre-test) to 84.4 (post-test) shown in Table 1.

Another pre-and post-test concerning students’ perception of their learning experiences were conducted to measure students’ learning experiences on language skills, teacher, tasks, interest and confidence. In table 4, students agreed their grammar and oral skills are improved except for writing skills, which decreased from 74.3% to 55.9%. Most of them satisfied with their teacher. They perceived that all the various assignment could improve their language. They like to complete the particularly e-activity tasks, and the percentage increases from 80 %to 85%. But their interest in accomplishing assignments is decreased in the pre-test by 94% become 91% in the post-test. Overall, the study showed a high percentage and increment from 82.9 in pre-test and 88.3 in post-test.

Table 4 Students' Learning Experience

| ITEMS | Pre-Test | Post-Test | different |
|-------|----------|-----------|-----------|
| LANGUAGE | | | |
| 1. I am pleased with my Mandarin grammar. | 71.4 | 82.3 | +10.9 |
| 2. I am satisfied with my Mandarin-language writing. | 74.3 | 55.9 | -18.4 |
| 3. I am satisfied with my Mandarin oral skills. | 57.1 | 67.6 | +10.5 |
| TEACHER | | | |
| 4. I am satisfied with the teaching and learning methods of Mandarin lecturers. | 91.5 | 91.2 | -0.3 |
| TASKS GIVEN | | | |
| 5. I am confident that all Mandarin language assignments can improve my language. | 97.1 | 97.1 | - |
| INTEREST | | | |
| 6. I am interested in completing all assigned Mandarin language assignments. | 94.3 | 91.2 | -3.1 |
| 7. I am interested in completing all Mandarin e-language assignments. | 80 | 85.3 | +5.3 |
| 8. I am interested in all the language activities year 2020. | 82.8 | 88.3 | +5.5 |
| CONFIDENT | | | |
| 9. I am confident that language activities can improve my Mandarin language. | 82.9 | 91.2 | +8.3 |
4.3 Pedagogical Practice

The REACH steps involve:
(a) Reflect on what you want and can do, (b) Evaluate current curriculum, (c) Analyse learner data, (d) Design research-based lessons, and (e) Focus on the data and results.

In this study, the teacher differentiated the instruction based on REACH steps. First, the researcher reflected on previous practice. Previous preliminary research done by [26] showed that students enjoyed learning in technology-integrated lessons. Still, they suggested the teacher consider their learning preferences. Therefore, before the class, the researcher asked the students to answer a questionnaire to determine their learning styles. The teacher then started to plan learning activities based on their learning styles which are audio, visual and kinaesthetic types. Second, the teacher evaluated the current curriculum and tailored the content to students’ level and needs. Third, the teacher analysed the data based on pre and post-test to get the real picture of students' progress. Then the fourth step, the teacher designed a research-based lesson. Lastly, during the learning process, the teacher continuously made some adjustments to address the emerging factor to achieve the targeted goals. Table 5 below shows the summary of pedagogical practice conducted in this study.

| Step | Activities involved                                                                 | Findings                                                                 |
|------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1    | the researcher reflected previous practice                                         | asked the students to answer a questionnaire to determine their learning styles; knowing more on the students |
| 2    | the teacher evaluated the current curriculum and tailored the content to the students' level and needs | Evaluated the suitability of the current curriculum; Tailored the content to the students' level and needs; Offered differentiated instruction and personalised instruction. |
| 3    | the teacher analysed the data based on pre and post-test to get the real picture of students' progress | Gathered quantitative data on learning performances                        |
| 4    | the teacher designed a research-based lesson                                        | continuously made some adjustments on the content                          |

5. Discussion

The study shows that the integration of Classkick in offering differentiated Mandarin instruction impacts students' learning positively. Students agreed that their grammar and oral skills are improved except for writing skills. The finding allied with the study of [11] technology apps has beneficial effects on language learning. Learners’ input supports the design and planning of the online program and its technology use but recommends a future workload reduction. In the current study, the finding shows students’ interest in accomplishing assignments has decreased; this may seem because of the additional workload. Also, it is identical to [13]. The use of online tone practice is worthwhile in a Chinese language class. Still, it might fit better into the curriculum as external assignments. In this study, the teacher continuously adjusts the content based on the REACH step to suit students’ learning needs during the learning process. It proved when the students perceived that they were satisfied with their teacher's teaching method and agreed that all the various assignments could improve their language. Also, they like completing the given tasks, particularly e-language tasks.

Indeed, online teaching presents pedagogical challenges; thus, Classkick was used to help teachers differentiate the content. The feature of Classkick confirms the four ways of differentiation by Tomlinson (2019), significantly to distinguish the content. In this study, students able to assess and learn various kinds of content. The content was presented as text, picture, audio and drag and drop patterns.
Also, students can receive timely feedback. It confirms [16]'s study that the WeChat app created opportunities to differentiate curriculum and get real-time feedback. It is similar to [21] that audio, graphics and text elements must be integrated into the mobile learning framework to help students learn. However, the teacher and students need to adjust themselves for effectiveness. When students perceived their writing skills were not as good as before, the student needs to adopt a self-learning concept to be more effective. The teacher also needs to know some teaching approaches for effective instruction, like mentioned by [19].

Classkick allows students to request help from their peers anonymously. Text, images, video, and audio can be easily integrated into assignments. It is an excellent tool for synchronous and asynchronous communication, blended classrooms, personalised learning, and cooperative learning [30]. In this study, the teacher, with the help of Classkick, can differentiate the content and assessment to meet students' learning styles. Classkick might fit within the SAMR model [29].

In S (Substitution), the students use Classkick to complete assignments (instead of completing tasks on paper). As for A (Augmentation), the teachers can provide real-time feedback to students instead of having documents graded the next day. It allows the move on and continues learning within a lesson/assignment rather than getting stuck. Next is the M (Modification); the students can include an image, video, or audio recording to respond to an assignment question. The features allow students to synthesise their analysis and answer in multiple modalities. Teachers embed video and text into lessons and assignments, providing information in numerous mediums and allowing students to learn by reading, listening, and watching. Lastly, the R (Redefinition), the students can anonymously request help from peers in real-time, and peers can switch roles from student to teacher to assist fellow students. It challenges more advanced students to achieve a level of understanding. They can teach others and provide additional students who are struggling more. The anonymity of requesting help makes it easier for students who need the extra support to feel comfortable asking for it.

A previous preliminary study [14] shows that students enjoy learning in a technology-integrated lesson. Still, there were suggestions teacher need to consider students various learning preferences. Therefore, students were asked to answer a questionnaire to determine their learning styles. It is for the teacher to plan learning activities based on students' different learning needs. Then the teacher evaluates the curriculum and tailors it to students' level and needs. Pre and post-test were carried out to get the real picture of students' progress. The teacher will make some adjustments to address the emerging factor to achieve the targeted goals. According to [27], it is crucial to choose wisely which evidence-based practises you will use to teach the same content to a diverse group of students. Thus, the research differentiates the content based on students' learning styles. The assignments and contents will be designed in the types of audio, video, text, picture and movement needed (drag and drop) to suit students' preferences. It confirms that REACH steps helped and provided guidance for the teacher to differentiate the lesson. Also, the unique feature of Classkick assisted the teacher in the determined content and assignments.

6. Conclusion
In conclusion, the results showed that the researcher worked to achieve the study's objectives. Overall, audio, graphics and text elements need to be integrated into differentiated content to suit students' learning preferences and enhance their performance. Multiple sources in educational research have criticised differentiated instruction. Still, a lack of studies that used appropriate research designs found evidence that differentiated instruction helps identify students' learning style, interest and improve learning. In short, educators need to clear that differentiated instruction does not have a different plan for students' knowledge each day. Putting students in permanent study groups based on information from the first day of the year; or teaching only the students at the lower level and making the students at the higher level educate themselves. Instead, students may be put in groups depending on their ability, interests, preparation, or preference. The "purposeful use of flexible grouping" is used, keeping in mind the lesson's
objectives. Lastly, teachers have to keep students up to high expectations. Continuous feedback from future research is indispensable for improving both the instructors and students' differentiated learning experiences. It is anticipated that instructors might use Classkick to offer differentiated instruction to enhance teaching effectiveness for Mandarin as a foreign language specifically and for all language instruction in general.

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