AN EXPLORATORY FACTOR ANALYSIS EXAMINING MANDARIN AS A FOREIGN LANGUAGE (MFL) LEARNERS’ SELF-EFFICACY AT MALAYSIAN PUBLIC UNIVERSITIES

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ABSTRACT

Background and Purpose: Self-efficacy is one of the aspects of human behaviours related to performance in social cognitive theory. It has been studied in social sciences, education, and languages. There are a variety of self-efficacy scales available in the English and French languages to test one’s self-belief in their ability to learn the target language. To date, no self-efficacy scale catered to the unique characteristics of Mandarin as a foreign or third language (MFL). The objective of this study is to give practical recommendations on creating valid self-efficacy instruments of MFL and making judgments on factor extraction, factor rotation, and factor labelling based on the foreign language literature.

Methodology: This quantitative study gathered information through an administration of a survey. The multipart survey consists of the demographic information section and the MFL self-efficacy scales distributed to MFL learners in Malaysian public universities. Data were collected randomly from 614 participants studying MFL at three different levels. Items for MFL self-efficacy were examined using SPSS version 25.0 software.
Findings: The final 13 MFL self-efficacy items were reduced to four factors with a total variance of 68.99%. The Promax rotation matrices revealed the presence of a simple four-factor structure, exhibiting the degree of strong factor loadings. The four factors were MFL Speaking, MFL Listening, MFL Reading, and MFL Writing.

Contributions: This research provides valid self-efficacy scales for MFL learning. The skill-based Scale could contribute to MFL teaching literature in the Malaysian context. Additionally, the study proposes future investigations which involve learning Mandarin with more emphasis on Chinese Characters.

Keywords: Mandarin as a foreign language, self-efficacy, exploratory factor analysis, non-native speaker, scale development.


1.0 INTRODUCTION
Self-efficacy is one of the aspects of human behaviours related to performance in the social cognitive theory. It has been studied in social sciences, education, and languages. There are a variety of self-efficacy scales available in the English and French languages to test one’s self-belief in one’s ability to perform something. The majority of earlier studies (Wang & Bai, 2016; Doménech-Betoret, Abellán-Roselló, & Gómez-Artiga, 2017; Zhu, Siti Maziha, & Gong, 2020) used general self-efficacy scales or abstract academic self-efficacy to test the students’ perceptions about their performance abilities. However, the majority of the scales in these mentioned studies were invented from general perceptions, and the items were not specific. Currently, there is no particular self-efficacy scale adapted to the unique characteristics of Mandarin as a foreign or third language. Therefore, this paper aims to develop a reliable and valid self-efficacy scale that reflects the four components of Mandarin as a foreign language (MFL) self-efficacy and addresses the distinctive features of MFL in the Malaysian context. This study aims to add theoretical and practical implications for learning and teaching Mandarin as a foreign language.
2.0 LITERATURE REVIEW

2.1 The Concept of Self-Efficacy

Self-efficacy is central to social cognitive theory in learning a second language or foreign language. Self-efficacy is a principal variable in predicting learners’ educational performance and actual abilities (Kolo, Jaafa, & Ahmad, 2017). Self-efficacy could reflect an individual’s confidence in their abilities to control motivation, behaviours, and social environment, which can influence all human experience (Bandura, 2006, as cited in Teng, Sun, & Xu, 2017). These manners include the goals for people to strive for, among energy and time spent to achieve the goals. In this theory, an individual could influence or be influenced by the environment or surroundings with personal, environmental, and behavioural interactions. Individuals’ beliefs (self-efficacy) in their capabilities to perform a task will determine the efforts and engagement they exert in the task (Ozkal, 2019). When learners gain or maintain self-efficacy through their personal experience of success in the task, they are motivated to continue learning and make progress learning (Myers, 2021). In other words, if learners are highly motivated to learn and succeed, they are more likely to achieve their goals, giving them a pleasant experience that could contribute to their overall self-efficacy.

2.2 Self-Efficacy in Education and Language Learning

Self-efficacy is especially key in education and second/foreign language learning. Foreign language learners must believe positively in their capabilities to learn foreign languages. Pajares and Urdan (2006, as cited in Howell et al., 2021) believed that self-efficacy is a motivational variable in learning. Without learners’ self-efficacy beliefs, one cannot examine other human functions such as motivation, learning, and academic performance. Students who perform successfully in higher education will have high academic efficacy and low emotional weariness and cynicism. Higher self-efficacy, on the other hand, will result in increased student engagement.

2.3 Self-Efficacy in Mandarin Foreign Language Learning

Numerous studies, such as Wang and Bai (2017), Chao, McInerney, and Bai (2018), and Siegle, DaVia Rubenstein, and McCoach (2020), have been done on the impact of self-efficacy beliefs on second/foreign language learning, especially in the English language. The influence of learners’ self-efficacy on MFL did not receive much attention in Teaching Mandarin by foreign language researchers or instructors. There have been limited theoretical or empirical studies in this area.
Recent studies looked at teachers’ self-efficacy in teaching the Chinese Language. Chen and Yeung (2015) studied the factors that influenced teachers’ self-efficacy in teaching Chinese as a foreign language in an English-speaking school system in Western Sydney schools in Australia. The study discovered that the influential factors on teachers’ self-efficacy are teacher factors, including proficiency in the English language, professional learning, teaching experience, and understanding of students. Students’ factors are student responses, classroom discipline, motivation, student-teacher relations, and age. Contextual factors such as culture, the influence of others, classroom size, and resources also impact teachers’ self-efficacy.

Using a narrative case study, Bao and Liu (2021) examined the relationship between teachers’ online teaching self-efficacy and engagement among Sino-Greece teachers teaching Mandarin Chinese as a foreign language. The study discovered that internal and external factors mediated the teachers’ online teaching self-efficacy. Positive internal and external factors increased teachers’ online teaching of self-efficacy and kept them more engaged.

The influence of self-efficacy on students’ Mandarin Chinese language learning studies is only done on heritage learners. Hong et al. (2018) examined Southeast Asian Primary School students’ online learning self-efficacy while learning traditional Chinese Pinyin. The study found that increasing the practice time improved learners’ affective factors.

The above studies are a good step toward exploring self-efficacy in Mandarin foreign language. However, they did not look at the influence of self-efficacy among non-heritage learners at high institutions. Therefore, this study tends to fill this gap. The study seeks to answer the following research questions:

1. What is the underlying structure of observable factors influencing the self-efficacy of non-native learners’ of MFL in selected Malaysian public universities?
2. How many components are involved in the self-efficacy Scale of MFL

3.0 RESEARCH DESIGN

3.1 Research Design
This quantitative research aims to develop a valid self-efficacy instrument of MFL and make judgments on factor extraction, factor rotation, and factor labelling based on foreign-language literature. With the help of six instructors, the survey was distributed during normal class sessions. The respondents were informed about the study’s objective at the beginning of the survey. The respondents were also notified that any information they provided would be used
specifically for research purposes, and all data gathered would be kept confidential. The respondents took part voluntarily, and their names were excluded from the questionary. The respondents, on average, took 10 minutes to complete the questionnaire. 5 questionnaires were incomplete out of the total surveys administered. As a result, around 98.3% of returned questionnaires were used for data analysis.

3.2 Research Participants

According to Etikan (2016), the term population refers to a big group with a common interest. The public universities in Malaysia offering Mandarin foreign language (non-native speakers) as an elective course were selected. Since all 20 public universities in Malaysia offer Mandarin as a foreign language, therefore the original population is too large. The researcher used cluster sampling to reduce the total number of participants in this study. Cluster sampling was randomly chosen from the targeted institutions, with an equal chance to participate in the research so that the findings could be generalized without bias. These clusters serve as a small-scale representation of the total population, covering the entire population’s characteristics. (Haq, 2017) The random sample approach was used to have as many Mandarins foreign language learners as possible and to establish a more accurate and firmer foundation for future research. Kalkbrenner (2021) suggested that the minimum sample size in psychometric studies should have at least 200 participants.

The current research was conducted among Mandarin foreign language (MFL) learners in selected public universities in Malaysia in semester one and semester two 2021/2022 academic year. MFL was offered in the selected universities as an elective course for whole universities. All selected universities offered Mandarin I, II, and III levels and focused on the communicative language teaching approach in language instruction. Teaching was centred on a variety of communicative functions that related to learners’ daily life, such as introducing themselves and their families, personal interest, and talking about their school life or community. Other language skills like listening, reading, and writing are paid less attention than speaking. Limited Chinese Characters are introduced to learners from Mandarin I to Mandarin III.

A total of 614 (Male: N=421 Female: N=193) MFL learners from selected public universities in Malaysia took part in this study. These individuals’ ages ranged from 18 to 24 (M=21.3, SD= 2.8). All selected institutions offered elective credit MFL courses. From the overall total, 281 (45.5 %) of the participants were learning level one Mandarin, 145 (23.6 %)
were taking level two, and 187 (30.5%) were advanced learners taking level three. All the participants are non-native speakers whose first language is Malay.

3.3 Research Instruments

The self-reported questionnaire consists of items evaluated ranging from strongly disagree to strongly agree. The 7-point Likert Scale with two parts MFL survey was used in this study. The survey contains demographic information and 23 MFL self-efficacy items.

The demographic section includes participants’ background information such as gender, age, duration of learning the target language, level of Mandarin course enrolled, their first language, and whether they studied Mandarin before taking the course at the university. Respondents were also asked to rank their language learning aptitude, motivation for learning Mandarin, the significance of learning the language, and its difficulty.

A pilot test was conducted before the actual study, and items for MFL self-efficacy were examined using SPSS25. At the same time, the data adequacy for EFA was determined using KMO (Kaiser Meyer Olkin) and Bartlett’s test of Sphericity.

Table 1: MFSES KMO and Bartlett’s Test

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | 0.956 |
| Bartlett’s Test of Sphericity | Approx. Chi-Square | 7260.614 |
| | df | 253 |
| | Sig. | 0.000 |

3.4. Research Procedures

Several steps were taken to determine the Scales. These include:

Step one: Determining the items for the Scale

The researchers designed a skill-based and course-targeted instrument based on the social cognitive theory. The MFL self-efficacy scale was created in the Malaysian learning context to assess learners’ self-efficacy in applying language knowledge, their classroom performance, and the management of their learning process. The components for the Scale were derived from two sources: existing surveys on English as a foreign language self-efficacy and semi-structured interviews with MFL students.

The researchers conferred initially on the existing instruments for evaluating self-efficacy beliefs in English as a foreign language setting to offer theoretical support for item
development (Kim, Wang, & Truong, 2021; Yu, Xu, & Zheng, 2017). The researchers adopted some items from the established questionnaire, which were confirmed by positive psychometric properties. Clark and Watson (2019) argued it is particularly important to procure in a scale development to increase the validity and reliability of the instrument. The second valuable resource used to generate the Scale items was a semi-structured interview session with MFL learners. Clark and Watson (2019) stated that to improve the quality of the items in the Scale, it is a good practice to involve the learners in item generation. 15 Malaysian undergraduate students participated voluntarily to undergo a 10-15 -minute interview on MFL self-efficacy. The analysis from the transcription guided the item generation in the new Scale.

The Mandarin as a foreign language self-efficacy (MFLSES -Mandarin foreign language self-efficacy items) was designed with 7- a point Likert scale ranging from 7 (strongly disagree) to 1 (strongly agree). The structure is a set of written statements containing a declaration of the learner’s confidence in learning MFL through four skills. Each question in the Scale was constructed as a “can-do” statement to reflect the assessment of ability and conduct. The participants were required to rate their confidence in capabilities in the four language skills of the target language learning process. The initial Scale generated 26 items. The items were written in simple words, reviewed, and amended to suit Malaysian undergraduate students’ English as a Second Language (ESL) standards. The researchers deleted items such as “I can understand the movie with the subtitle In English” since all Chinese Movie subtitle are written in Chinese Characters, and students at the basic level are not able to read in Chinese Characters because MFL teaching and learning in the Malaysian context do not emphasize Chinese characters. Other items that do not suit the basic Mandarin level were also deleted. In addition, two items were added to students’ interviews in Listening: “I can differentiate the tones in Mandarin.” It is because Mandarin is a tonal language whereby the different tones of the words represent different meanings, and differentiating them can help one understand better. Another item added to reading skills is “I can understand a simple sentence in Mandarin with pinyin.” Based on the interview, students expressed their learning experience that “it is complicated for me to recognize the Chinese characters if pinyin is provided, I can understand the paragraph better.”

**Step two: Experts’ evaluation of content validity**

The researchers sent the original self-efficacy Scale with 26 items to 2 experts. Two experts specialize in educational psychology with many years experiences of teaching and doing research in Malaysia. When the sample was sent to the experts, it was categorized into four
subscales representing general Mandarin language learning self-efficacy in speaking, listening, reading, and writing. The researchers explained to the experts the rationale behind the items and subscales included in the Scale. The experts were invited to assess all 26 items demonstrating MFL self-efficacy and all items indicating the desired component. Experts are encouraged to add, omit, or modify the items based on their experience. Every expert gave recommendations on rephrasing or rewriting certain elements. Based on the experts’ advice, the researchers revised the phrasing of the pertinent elements.

One expert suggested adding the items in reading: *I can read a short paragraph in Mandarin with Pinyin provided.* Chinese characters are not emphasized in most Malaysian higher institutions, especially at the foundation or beginner level. It is because MFL teaching in the Malaysian context is focused more on the communicative aspect, where most learners are learning the target language PinYin (Roman letter). One expert suggested adding an item in speaking: *I can introduce my family and friends to others in Mandarin Chinese.* Another expert proposed inserting more items in speaking and listening since most universities focused more on these two skills than reading and writing.

In addition, the researchers adjusted the items in reading: *I can read Mandarin Chinese short paragraphs in Pinyin.* *I can read Mandarin Chinese short paragraphs without Pinyin.* Items in the writing component were also amended: *I can write simple Mandarin Chinese sentences in Pinyin.* *I can write simple Mandarin sentences in Chinese characters.* The addition was based on the student’s learning experience, whereby most MFL learners in Malaysian higher institutions cannot read and write Chinese characters very well.

After adding and modifying, the 2 experts accepted and verified 23 items in the final Scale. Three items for speaking and seven for listening, nine for reading, and four for writing, respectively.

**Step three: Scale validity and reliability testing**

The SPSS (Statistical Package for Social Sciences) version 23.0 was employed for all the statistical analyses in this study. The researchers distributed the 23 items of the MFL Self-efficacy scale together with a background questionnaire to MFL learners at three public institutions in Malaysia. Participants’ responses were utilized to undertake item analysis, reliability, validity analyses, and cross-validation analyses.
4.0 ANALYSIS AND DISCUSSION

4.1 Reliability Analysis

Cronbach’s Alpha was used to conduct internal consistency reliability testing for the 23-item skill-based MFL self-efficacy Scale.

The general value for Cronbach’s Alpha of the 23 items scale was $\alpha = .943$. More specifically, the value of Cronbach’s Alpha for the 3-item Speaking self-efficacy subscale (items 3,4,5) was $\alpha = .785$. The item-total correlation ranges from .618 to .629. The value of Cronbach’s Alpha for the 7-item Listening self-efficacy subscale (items 2,7,8,14,15,16,18) was $\alpha = .867$, with the inter-item correlation ranging from .550 to .719. The value of Cronbach’s Alpha for the 9-item Reading self-efficacy subscale (items 1,10,11,12,13,17,20,21,23) was $\alpha = .852$. The inter-item correlation ranges between .478 to .653. The value of Cronbach’s Alpha for the 4-item Writing self-efficacy subscale (items 5, 9,19,22) was $\alpha = .776$, and the inter-item correlation ranges from .515 to .637.

Table 2: Cronbach’s Alphas for Mandarin foreign language self-efficacy scale

<table>
<thead>
<tr>
<th>subscale</th>
<th>N</th>
<th>Items</th>
<th>Cronbach’s $\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking</td>
<td>618</td>
<td>3</td>
<td>0.785</td>
</tr>
<tr>
<td>Listening</td>
<td>618</td>
<td>7</td>
<td>0.867</td>
</tr>
<tr>
<td>Reading</td>
<td>618</td>
<td>9</td>
<td>0.852</td>
</tr>
<tr>
<td>Writing</td>
<td>618</td>
<td>4</td>
<td>0.776</td>
</tr>
</tbody>
</table>

4.2 Exploratory Factor Analysis

Exploratory factor analysis (EFA) was first run on the responses of 614 participants from Malaysian public universities to analyze the items and check the construct validity of the developed MFL self-efficacy scale. The Scale consists of 23 items and is categorized into four distinctive factors: Listening Self-Efficacy, Speaking Self-Efficacy, Reading Self-Efficacy, and Writing Self-Efficacy. Initially, the researcher examined the inter-variables correlation matrix for the Scale as was done for previous analyses. Secondly, for each analysis, the factor loadings for each dimension were estimated, and to increase the interpretability of the dimensions, the initial factors were then subjected to Varimax rotation to maximize the variance of the factor loadings by making high loadings higher and lower loading lower for each factor (Firdaus, Nugroho, & Widodo, 2021).

The procedures of previous analyses were strictly followed, such as exploration of the correlation matrix and factor loading of .50 and above and examining the Eigenvalue,
commonalities, and total variance explained. The degree of intercorrelation among the variables is justified using Exploratory Factor Analysis (EFA) as indicated by the Correlation Matrix. Without this interconnection, the analysis of EFA would be meaningless, and its result would not represent its latent variables under investigation. According to Pallant (2022), there should be at least a degree of 30% relationships among the items to obtain meaningful factor analysis results. If the correlations among the items are less than ≥ .30, the analysis of EFA will yield many factors as indicators (Watkins, 2021). Thus, correlation matrixes of the investigated scales were thoroughly examined to examine the relationship among observed variables. The result of the correlation matrix indicates relationships among the observed variables (manifests), which suggests that the data could be used for any meaningful factor analysis.

Interestingly, EFA with varimax rotation was executed on the first 23 items of Mandarin Self-Efficacy; the respondents obtained the data. Items were included in a factor if they had a loading of 5.0 or greater. The analysis generated several understandable and meaningful factors with eigenvalues greater than one, which explained 68.99% of the variance in Mandarin Self-Efficacy scores. Moreover, the relationship among the items also achieved a satisfactory level. Barlett’s test of Sphericity was statistically significant, $\chi^2 (253) = 7260.614$, $p = .001$, KMO= .956. The values of anti-image for the individual items that showed their quality and uniqueness ranged between .777 and .900 (see Table 1 for detail).

The first factor contained 3 items that reflected the learners’ beliefs in their ability to perform writing exercises and was labelled Writing Self-Efficacy. The second factor consisted of four statements that generally echoed an ability to read properly and based on their contents, and the factor was named Reading Self Efficacy. The third factor consisted of three items and pertained to learners’ beliefs about their ability to speak Mandarin fluently and was characterized as Speaking Self Efficacy. Finally, the fourth factor consisted of another 3 items, which measured the students’ beliefs of their ability to listen to the Mandarin language and, based on the content of their items, was labelled Listening Self Efficacy.

After a visual evaluation of the Promax rotation matrices utilizing the Exploratory Factor Analysis (EFA) for the targeted Scale, it was determined that the varimax rotation matrix presented a simple structure without cross-loading items. The values of communalities also indicate the level of item quality ranging from about 0.513 to 0.795, while the variance explained accounted for 68.99% of the total variance.

To remove the items, the researcher conducted three steps. The first step was to delete item 20 due to the low communalities (below .03). The second step was to omit the factor
loading below .50. Items 2 (I can do homework alone when they include reading Mandarin simple texts), 7 (I can understand questions that my teacher asks in Mandarin), 11 (I can understand a simple sentence in Mandarin without Pinyin), 12 (I can understand Mandarin songs), 13 (I can understand daily conversation in Mandarin), 18 (I can answer my teacher’s questions in Mandarin), 22 (I can write short paragraphs about myself in Mandarin (characters)) and 23 (I can understand reading passages (in Mandarin) selected by my instructor) did not load in any of factor (i.e., the loadings did not meet the minimum acceptable factor loading of 0.50). The items under factor 1, Writing self-efficacy: 8 (I can differentiate Mandarin tones) and 13 (I can understand daily conversation in Mandarin) should load under factor 3, Listening self-efficacy. Item 1 (I can understand simple sentences in Mandarin) can be loaded under both factors of Speaking and Reading. Item 14 (I can understand my teacher’s simple questions in Mandarin) cross-loaded on two factors with relatively moderate loadings (i.e., 0.38 and 0.563); however, it was retained under factor four since it has strong loading compared to factor 1.

After deleting these items mentioned above, the resulting factor structure accounted for a 68.4% variance. The Eigenvalue of the first factor (Writing Self Efficacy) accounted for 46.09% of the total variance of the Scale, followed by the second factor (Reading Self Efficacy) with an eigenvalue of 1.092, which explains 7.79 % of the variance in the original data. The third-factor Eigenvalue is 1.007, which explains 7.19% of the variance in the original data. The fourth-factor Eigenvalue is 0.758, which explains 5.4 % of the variance in the original data.

Table 3 displays the commonalities of the 13 items and the varimax rotation matrix with item loadings to the extracted variables. The loadings from the Promax rotation matrices are conceptually similar to standardized regression coefficients in that they represent the importance of a variable to a factor while accounting for the effect of other variables (Flora & Flake, 2017).
Table 3: Summary of Exploratory Factor Analysis (EFA) for 13-Item MFLSE

<table>
<thead>
<tr>
<th>Item</th>
<th>Writing</th>
<th>Reading</th>
<th>Speaking</th>
<th>Listening</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE9W</td>
<td>I can leave a note for another student in Mandarin.</td>
<td>0.79</td>
<td></td>
<td></td>
<td>0.63</td>
</tr>
<tr>
<td>SE5W</td>
<td>I can write a text in Mandarin mixed with Pinyin and Characters.</td>
<td>0.67</td>
<td></td>
<td></td>
<td>0.58</td>
</tr>
<tr>
<td>SE19W</td>
<td>I can form new sentences from words I have just learned.</td>
<td>0.64</td>
<td></td>
<td></td>
<td>0.57</td>
</tr>
<tr>
<td>SE17R</td>
<td>I can understand short Mandarin passages with Pinyin.</td>
<td>0.785</td>
<td></td>
<td></td>
<td>0.62</td>
</tr>
<tr>
<td>SE10R</td>
<td>I can understand simple sentences in Mandarin with Pinyin.</td>
<td>0.774</td>
<td></td>
<td></td>
<td>0.62</td>
</tr>
<tr>
<td>SE20R</td>
<td>I can find out the meanings of new words using a monolingual dictionary.</td>
<td>0.540</td>
<td></td>
<td></td>
<td>0.55</td>
</tr>
<tr>
<td>SE21R</td>
<td>I can understand telephone numbers spoken in Mandarin.</td>
<td>0.551</td>
<td></td>
<td></td>
<td>0.54</td>
</tr>
<tr>
<td>SE4S</td>
<td>I can introduce myself to other people in Mandarin.</td>
<td>0.747</td>
<td></td>
<td></td>
<td>0.62</td>
</tr>
<tr>
<td>SE3S</td>
<td>I can greet other people in Mandarin</td>
<td>0.724</td>
<td></td>
<td></td>
<td>0.54</td>
</tr>
<tr>
<td>SE6S</td>
<td>I can talk about my family and friends in Mandarin.</td>
<td>0.594</td>
<td></td>
<td></td>
<td>0.61</td>
</tr>
<tr>
<td>SE15L</td>
<td>I can understand my teacher (to someone else) in Mandarin.</td>
<td>0.812</td>
<td></td>
<td></td>
<td>0.71</td>
</tr>
<tr>
<td>SE16L</td>
<td>I can discuss my general interest with my fellow students (in Mandarin)</td>
<td>0.656</td>
<td></td>
<td></td>
<td>0.63</td>
</tr>
<tr>
<td>SE14L</td>
<td>I can ask my teacher simple questions in Mandarin.</td>
<td>0.563</td>
<td></td>
<td></td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>Eigenvalue</td>
<td>6.056</td>
<td>1.086</td>
<td>1.004</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Cronbach’s Alpha</td>
<td>.757</td>
<td>.765</td>
<td>.785</td>
<td>.827</td>
</tr>
</tbody>
</table>

Note. Factor loadings < .50 are suppressed

There was a fairly apparent four-factor pattern, and the loadings were interpretable with items. Factor 1 consisted of 3 items labelled “writing self-efficacy,” with loadings ranging from .64
to .79. Factor 2 consisted of 4 items labelled “reading self-efficacy,” with loadings ranging from .551 to .785. Factor 3 consisted of 3 items labelled “speaking self-efficacy,” with loading ranging from .594 to .747, and factor 4 consisted of 3 items labelled “listening self-efficacy”, with loading ranging from 0.563 to .812.

The correlation matrix was duplicated to ensure the factor solution was correct. In conclusion, an exploratory factor analysis of the items in the Mandarin foreign language self-efficacy questionnaire produced an interpretable four simple structure factors. The items in the four criteria were classified as follows: Writing self-efficacy, speaking self-efficacy, reading self-efficacy, and listening self-efficacy. Initially, these three factors accounted for 59.3% of the overall variation. However, when the 10 items were removed from the subsequent analysis (Items 1,2,7,8,9,10,11,12,13,18,22,23), the total variance explained increased to 68.99% of total variance explained. For the oblique rotation, the correlations between calculated components ranged from .591 to .701 (see Table 4).

Table 4: Correlation of extracted factors (MFLSES)

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.000</td>
<td>0.625</td>
<td>0.591</td>
<td>0.701</td>
</tr>
<tr>
<td>2</td>
<td>0.625</td>
<td>1.000</td>
<td>0.625</td>
<td>0.658</td>
</tr>
<tr>
<td>3</td>
<td>0.591</td>
<td>0.625</td>
<td>1.000</td>
<td>0.680</td>
</tr>
<tr>
<td>4</td>
<td>0.701</td>
<td>0.658</td>
<td>0.680</td>
<td>1.000</td>
</tr>
</tbody>
</table>

5.0 CONCLUSION

This study aims to design a questionnaire that measures the efficiency and reliability of the questionnaire in MFL learners in the Malaysian context based on prior studies. The exploratory factor analysis was employed to achieve the study’s objective and answer the research questions. The extraction method was used to investigate the factor structure of the Scale’s 23 items of skills based on MFL self-efficacy. The final 13 MFLSES items were reduced to four factors with a total variance of 68.99%. The varimax rotation matrix revealed the presence of a simple four-factor structure, exhibiting the degree of strong factor loadings. The four factors were labelled as MFL Speaking self-efficacy (Item 3,4,6), MFL Listening self-efficacy (Item 14,15,16), MFL Reading self-efficacy (Item 10,17,20), and MFL Writing self-efficacy (items 5,9,19). 11 items were deleted for the final analysis because of low factor loading (<.50) and cross-loading. Hypothetically, this finding is consistent with past studies such as Zhu et al.
(2020); Yu et al. (2017). It can be strengthened both theoretically and statistically that the writing, reading, speaking, and listening of self-efficacy are distinctive factors of the self-efficacy construct, as was suggested by past studies (Zhu et al., 2020; Yu et al., 2017) since any negative error was absent negative variances and higher goodness of fit indices. The redesigned questionnaire was validated as a reliable tool for evaluating the self-efficacy of MFL learners in the Malaysian context. It is anticipated that the tool can be utilized for future investigations.

Only EFA was evaluated to address the research question, and four factors from 13 items were determined to be involved. This outcome leaves certain questions about CFA (Confirmatory Factor Analysis) unanswered. It could be more meaningful if the study validates the hypothetical model. (Figure 1).

![Hypothized model for factors influencing MFL Achievement (AMOS)](image)

The skill-based Scale included is more focused on speaking and listening self-efficacy because Chinese characters based on writing are not given much attention since learning MFL in the Malaysian context emphasizes more on the communicative aspect more. Therefore, the Scale needs to be adjusted further for future investigation, which involves learning Mandarin with more emphasis on Chinese characters.
REFERENCES


