

Validity and Reliability of an Instrument Measuring Soft Skills among Secondary School Students

Norakma Ishak*, Nor Hasnida Che Md Ghazali, Syafiqah Hanani
Baharim, Mohd Arifin Ghazali, Mohd Afifi Bahurudin Setambah

Faculty of Human Development, Universiti Pendidikan Sultan Idris, Malaysia

*Corresponding Author Email: akmaishak79@gmail.com

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Abstract

Soft skills are essential competencies that need to be cultivated among students to equip them with the ability to solve real-life problems by applying knowledge acquired throughout their schooling experience. Given the absence of a specific instrument designed to measure students' soft skills, this study developed an instrument adapted from previous research. The instrument encompasses four constructs: communication, teamwork skills, leadership skills, and critical thinking and problem-solving skills. The purpose of this study was to examine the validity and reliability of the adapted instrument in assessing soft skills among lower secondary students. A pilot study was conducted with 57 students selected through simple random sampling. Content validity was evaluated using the Content Validity Index (CVI), involving five appointed experts, while internal consistency reliability was assessed using Cronbach's alpha coefficient. The CVI result of 0.86 indicated that the instrument demonstrates a high level of content validity, clarity, and alignment with the research objectives. The Cronbach's alpha value of 0.767 suggested that the instrument has acceptable reliability and falls within a moderate level. Exploratory factor analysis (EFA) is recommended following the item refinement process to confirm the underlying element measured by the instrument.

Keywords: Soft Skills, Content Validity, Reliability, Lower Secondary Students, CVI, Cronbach's Alpha

Introduction

In the national education system, soft skills are a crucial domain during the implementation of teaching and learning sessions based on 21st-century learning, which emphasizes the 4Cs elements: communication, creativity, critical thinking, and collaboration. Soft skills are one of the key agendas in the Malaysia Education Blueprint 2013–2025, aiming to develop students holistically in terms of physical, emotional, spiritual, and intellectual aspects to fulfill the aspirations of the National Education Philosophy (Nor Aishah et al., 2022). The implementation of soft skills among students begins at the secondary school level to prepare

them for the challenges of the workforce in the era of the Industrial Revolution 4.0 (Mohd Hussin et al., 2021).

Soft skills are defined as competencies, abilities, or proficiencies that individuals must master, such as cognitive, psychomotor, affective, and social skills, to help them succeed academically and professionally (Siti Kausar & Mohd Noor, 2021; Mohd Hussin et al., 2021; Ilangko, 2021). Students who successfully acquire soft skills will demonstrate positive attitudes, the ability to communicate with others, critical and creative thinking, high motivation, and the ability to work collaboratively in a team (Ilangko, 2021). Therefore, every student must be equipped with these soft skills to ensure that they not only excel academically but also develop the personal qualities needed for the workforce. As a result, their chances of gaining employment are higher than peers who do not possess strong soft skills. There are seven soft skills outlined by the Ministry of Higher Education (2006), namely communication skills, critical thinking and problem-solving skills, teamwork, lifelong learning and information management, entrepreneurial skills, ethics and professional morals, and leadership skills (Azhar et al., 2021; Mohd Fikri, 2019). In the context of higher education in Malaysia, soft skills are implemented through curricular activities (i.e., teaching and learning) and co-curricular activities (i.e., sports and arts) (Siti Kausar et al., 2017). The purpose of implementing soft skills among university graduates is to ensure they can easily secure employment after graduation, as today's workforce not only requires academic excellence but also the mastery of new and additional essential skills (Tyza Lytha Rimaya & Abdullah, 2013).

Soft skills are also applied among secondary school students to fulfil the six student aspirations stated in the Malaysia Education Blueprint 2013–2025 (PPPM), aiming to produce balanced individuals in terms of physical, emotional, spiritual, and intellectual aspects, as outlined in the National Philosophy of Education. The integration of soft skill elements is viewed as an effort to help students qualify for further education at a higher level (Irwan Fariza et al., 2020).

However, the number of soft skills constructed among secondary school students is not the same as the seven soft skills set by the Ministry of Higher Education. Therefore, based on the studies by Mohd Fikri (2019) and Ilangko (2021), four constructs were identified as suitable for assessment among secondary school students: communication skills, teamwork skills, leadership skills, and critical thinking and problem-solving skills. According to Ilangko (2021), communication and teamwork skills are frequently applied in Malay language subject lessons in secondary schools. This statement is supported by Azhar et al. (2021), who stated that communication skills are highly important, whether in face-to-face, online, or written interaction using language as a medium. Mastering communication skills also helps students acquire more complex soft skills.

Communication skill is the ability of an individual to convey ideas, share and exchange opinions, and interact with the community (Fatin Izati & Khadijah, 2022; Noor Afzaliza Nazira & Maizatul Haizan, 2021). According to Azyani, Sheerad, and Aida Hanim (2019), as well as Siti Kausar and Mohd Noor (2021), there are three characteristics of effective communication skills in soft skills: the ability to express ideas clearly and confidently, either verbally or in writing; being an active listener who provides feedback; and the ability to deliver

presentations clearly and confidently at an appropriate level. Thus, communication is the ability to convey information and respond to the information received.

Teamwork skill refers to interpersonal intelligence. Conceptually, working in a group or team involves collaboration among several individuals with different abilities. It includes three stages: building relationships, interacting, and working effectively to achieve a common objective; understanding and exchanging roles between group members and the leader; and being able to recognize and respect the attitudes, behaviors, and beliefs of others (Siti Kausar Mohd Noor, 2021; Wan Azhar & Wan Muhammad Marzudi, 2021). This skill emphasizes interaction among group members, cooperating to achieve a common goal, and respecting others' opinions while carrying out project tasks or completing assignments (Mohd Fikri, 2019).

Leadership skill is a form of emotional intelligence that refers to a leader's ability to influence group members to work toward achieving a goal (Azyani et al., 2019). This skill involves three stages: understanding basic leadership theories, being able to lead a project or task, and being capable of alternating roles between a group leader and members (Siti Kausar & Mohd Noor, 2021). Therefore, leadership skills involve the ability to lead, confidence in completing tasks, tolerance among group members, and achieving consensus in task execution.

Critical thinking and problem-solving skills relate to logical-mathematical intelligence, which refers to the ability to think critically to help students understand and assess problems logically, make rational judgments, and plan solutions with strong evidence and reasoning to support the solution (Adiman Nazrullah & Siti Mistina, 2024; Siti Sarah & Lilia, 2021). These skills are interpreted as being flexible, analytical, systematic, and open-minded when solving project-based tasks or real-life problems.

At the secondary school level, soft skill elements are implemented through teaching and learning sessions as well as co-curricular activities. During teaching and learning, the STEM approach is used by teachers as it is highly relevant in guiding students to solve problems, collaborate in teams, and communicate with one another (Kong & Mohd Effendi, 2020), in addition to transmitting new knowledge to students. A variety of co-curricular activities also enhance students' potential (Mohd Fikri, 2019). It is evident that students who participate in classroom learning, social activities, and co-curricular programs can improve their soft skill levels (Irwan Fariza et al., 2020). Therefore, there is a need to measure the level of soft skill mastery among secondary school students.

Thus, the soft skills assessment instrument was developed based on four main constructs identified through a review of literature: communication skills, teamwork skills, leadership skills, and critical thinking and problem-solving skills. Meanwhile, to ensure that this instrument can collect high-quality data and information, it must be both valid and reliable. Validity refers to the extent to which an instrument measures what it is intended to measure, while reliability refers to the internal consistency of the instrument in analyzing data to produce similar results across different times and settings (Ruhaidi Amin et al., 2020). Therefore, this study was conducted to ensure that the instrument possesses an acceptable level of validity and reliability, enabling it to measure the mastery level of soft skills among lower secondary school students.

Research Problem

Although various STEM-based educational activities have been implemented, most students still lack social skills because many adolescents today spend their free time engaging in passive activities such as browsing the internet and playing video games individually (Jamsari et al., 2020). This indicates that they have limited interaction and social engagement with others during their leisure time activities that are essential for developing social skills as individuals living in a community. This clearly proves that students are only able to practice social skills during the teaching and learning process conducted by teachers in the classroom.

The assessment of soft skills implementation among secondary school students needs to be conducted to determine the extent to which students are available to apply soft skills in their lives as learners. According to Mohd Hussin et al. (2021), the process of evaluating and ensuring the quality of students produced is one of the key components of the national education system. Therefore, the assessment of soft skills must be carried out to evaluate students' ability to practice these skills. However, there is no standardized soft skills assessment instrument applicable to all countries, as it depends on the specific context of each country (Mohd Hussin et al., 2020). Therefore, there is a need for teachers to carry out assessments of soft skills based on their students' context and appropriate constructs, as there is no specific instrument available to measure the level of soft skills mastery, especially among secondary school students (Mohd Hussin et al., 2020; Uvanthi et al., 2018). This is to help teachers determine whether the activities they conduct are effective in developing soft skills within each student.

Hence, the findings of this study are highly significant for students, teachers, schools, and the Ministry of Education in determining whether the planned activities have successfully shaped students' personalities as inspired by National Education Philosophy. Hence, the adapted instrument can be implemented to measure the level of soft skills mastery among secondary school students in integrating soft skills elements within themselves.

Research Questions

This study was conducted to ensure that the adapted soft skills assessment instrument possesses high validity and reliability in measuring soft skills mastery among secondary school students. Specifically, the objectives of this study are to:

- 1) Determine the expert validity of the instrument using the Content Validity Index (CVI) method.
- 2) Determine the reliability of the instrument through internal consistency using the Cronbach's Alpha coefficient.

Literature Review

Soft skills are among the abstract concepts that are difficult to measure during the teaching and learning process in the classroom. The implementation of activities that focus on soft skill elements aims to fulfill the aspirations outlined in the Malaysia Education Blueprint 2013–2025 (MEB 2013–2025), which seeks to ensure that every student reaches their full potential as inspired by the National Education Philosophy (NEP). Several studies have assessed the level of soft skills mastery among primary and secondary school students. The study by Nor Aishah et al. (2022) examined the relationship between primary school students' involvement in co-curricular activities and their soft skills. Another study by Mohd Hussin et

al. (2020) investigated the assessment practices of soft skills among secondary school students by teachers during teaching and learning activities in the Tawau district. A subsequent study by Ilangko (2021) was conducted qualitatively and focused on the influence of pedagogy in the integration of soft skills among secondary school students. The final study by Mohd Fikri (2019) examined the level of soft skills mastery among secondary school students in Klang, with the study population consisting of Form Four students. Both Ilangko (2021) and Mohd Fikri (2019) focused on the mastery level of soft skills among Form Four students, whereas the study by Mohd Hussin et al. (2020) centered on teachers' practices in assessing students' soft skills.

Conceptual Framework of the Study

Soft skills are one of the domains that students are required to master, as outlined in the Theory of Multiple Intelligences (Gardner, 1983). Gardner (1983) defined intelligence as the ability to solve problems and create new products. According to him, everyone possesses at least eight types of intelligence: verbal-linguistic, logical-mathematical, visual-spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic intelligence (Kho et al., 2020; Ikhsan & Rohizani, 2010).

In addition to the Theory of Multiple Intelligences, this instrument also supports the Theory of Emotional Intelligence. Emotional intelligence, or EQ—also known as emotional literacy—is defined as the ability to understand oneself and others, demonstrate empathy, lead or influence others, motivate oneself, and manage one's impulses (N.S. Rajendran, 2018). Individuals with high emotional intelligence are characterized by their ability to socialize empathetically and compassionately, possess strong social skills, and use emotional awareness to regulate their behavior (Siti Nazalia et al., 2020). The Ministry of Education Malaysia (MoE) has also outlined seven constructs that students should master: communication skills, technological skills, planning and organizing activities, teamwork skills, problem-solving skills, information management and analysis skills, mathematical thinking and application skills, and cultural understanding (Mohd Hussin et al., 2021). Teachers can incorporate these constructs into their lessons through appropriate and engaging activities.

Based on these theories and the student competencies outlined in the MEB's student aspirations, the conceptual framework for the soft skills proficiency instrument among lower secondary students has been developed, as shown in Figure 1.

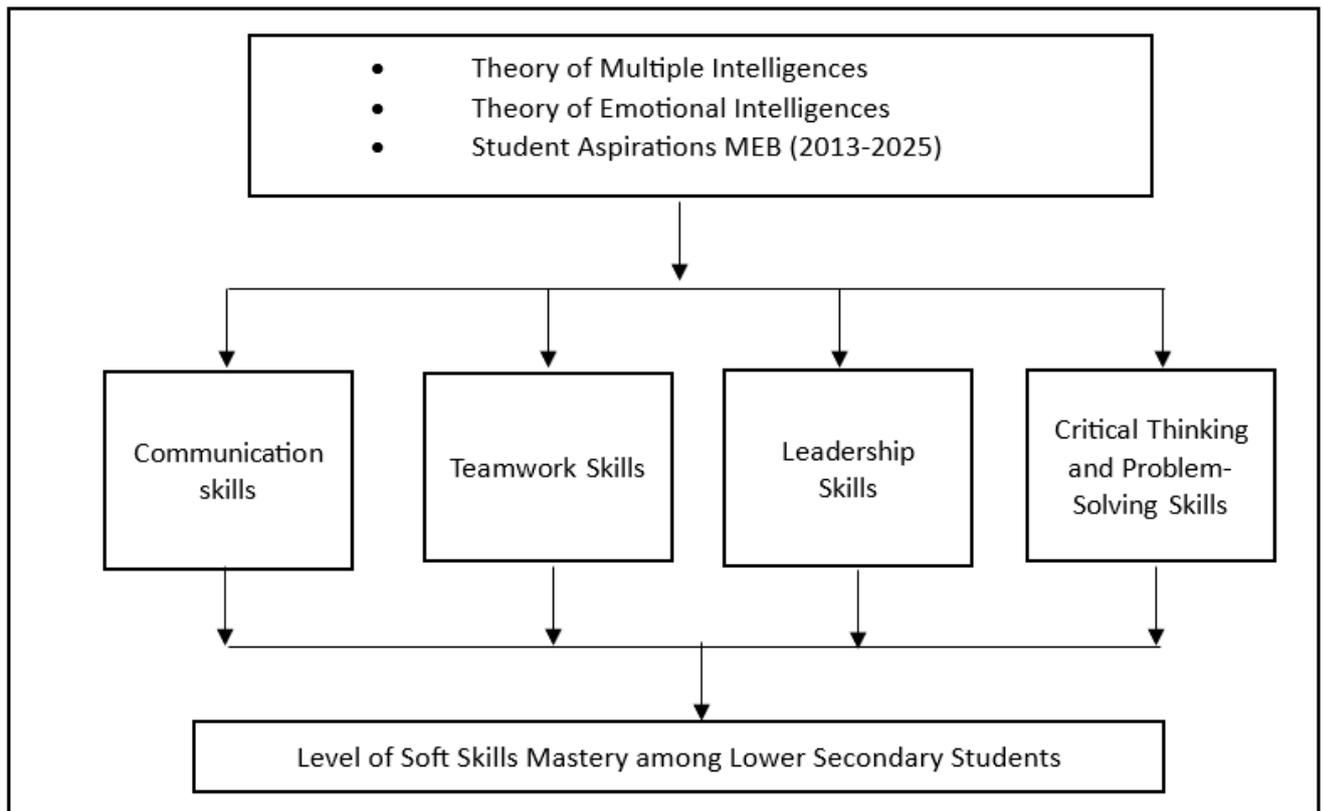


Figure 1: Conceptual Framework of the Study on the Development of a Soft Skills Mastery Instrument *adapted from the study by Mohd Fikri (2019)*

Research Methodology

This research methodology section discusses three components: (i) research design, (ii) study population and sample, and (iii) research instrument.

Research Design

This study was conducted using a quantitative approach through a survey method utilizing a questionnaire. This method was chosen to expedite the data collection process and ensure that the study findings could be generalized accurately and effectively to the study population (Chua, 2021; Othman, 2013). The adapted instrument was subjected to expert validation. Accordingly, content validity was conducted using a written questionnaire survey. The instrument was evaluated by two groups of experts: professional/content experts and field/lay experts (Mohd Effendi et al., 2017). One of the purposive sampling techniques, namely expert sampling, was used to select the evaluators (Mohd Hussin et al., 2020). This sampling technique is appropriate for the study, as it requires expert knowledge to determine whether the constructed items align with the intended constructs. Consequently, five experts were appointed—with their consent—to validate the instrument: two professional experts and three field experts, each with over ten years of experience in the field of education. The researcher provided them with relevant documents, including the appointment letter, a brief study synopsis, and a validation form containing a 5-point scale to evaluate the suitability of each item based on the elements being measured.

A summary of the background of the appointed experts is presented in Table 1 below.

Table 1

Selection of Experts for Content Validity Based on Area of Expertise

Expert	Position	Area of Expertise	Institution
A	Teacher	STEM Ambassador	SABK Maahad Al Ummah, Chemor
B	Teacher	Educational Measurement and Evaluation	SMK Sultan Muhammad Shah, Parit
C	Senior Language Teacher	Master Trainer for Malay Language	SABK Maahad Ehyak Diniyah Islamiah, Kg.Gajah
D	Senior Lecturer	Educational Measurement and Evaluation	Universiti Pendidikan Sultan Idris
E	Senior Lecturer	Educational Measurement and Evaluation	Universiti Pendidikan Sultan Idris

Content Validity Process

The validation process involved content validity to ensure that the questionnaire only includes items that are intended to be measured (Othman, 2013). Expert evaluations of the instrument will be analyzed using the Content Validity Index (CVI), as this method is widely used in the fields of education and social sciences for validating questionnaire items (Nur Ain et al., 2025). This approach helps the researcher decide whether to retain or reject items based on expert feedback and CVI scores, as it considers the average level of item relevance based on expert evaluations (Zuriani Hanim & Muhammad Izzat, 2021).

Population and Sample

The population consists of lower secondary school students attending secondary schools. The sampling technique used is simple random sampling, as it provides each element in the population with an equal chance of being selected as a respondent (Norfishah, 2022).

Pilot Study

Before conducting the actual study, a pilot study must be administered to a sample that shares similar characteristics with the study population. This is done to ensure the reliability of the instrument and to verify the appropriateness of the questionnaire or instrument, as well as the implementation procedures in the actual study setting (Fauzi Hussin et al., 2014). Accordingly, a pilot study was carried out involving students from a secondary school in the Kinta Utara district. The appropriate number of respondents for a pilot study should not exceed 100 individuals or should be between 10 and 30 respondents if the total number of items does not exceed 100 (Chua, 2012). Therefore, a total of 57 students were selected using simple random sampling, where the researcher obtained a list of 120 students and selected every second student from the list. The questionnaire was administered in the same manner as planned for the actual study.

Research Instrument

The research instrument consists of four constructs and uses a five-point Likert scale, as recommended by Muhamad Saiful Bahri (2019), who suggested that a scale ranging from 5 to 8 points is appropriate for items requiring individual agreement. Thus, the researcher used a 5-point Likert scale with the following response options: 1 – Strongly Inappropriate, 2 – Inappropriate, 3 – Somewhat Appropriate, 4 – Appropriate, 5 – Strongly Appropriate, to evaluate the items for each construct measured. Table 2 shows the number of items included under each construct. The instrument was adapted from the study by Mohd Fikri (2019).

Table 2
Distribution of Items Measured Based on the Specified Constructs

Construct	Number of Items
Communication Skills	4
Teamwork Skills	4
Leadership Skills	4
Critical Thinking and Problem-Solving Skills	4

Results and Discussion

The analysis of findings and discussion of this study is divided into two parts: (i) Content Validity and (ii) Reliability Testing.

Content Validity

The results of the content validity analysis using the Content Validity Index (CVI) showed that the S-CVI (scale-level CVI) for this instrument was 0.86, which exceeds the acceptable threshold of ≥ 0.80 (Hashimah et al., 2018). The CVI analysis for all four constructs is summarized in Table 3.

Table 3
CVI Analysis Based on Expert Evaluation

Construct	Number of Items	S-CVI
Communication Skills	4	0.75
Teamwork Skills	4	0.85
Leadership Skills	4	0.85
Critical Thinking and Problem-Solving Skills	4	1.00
Total	16	0.86

Based on expert evaluation, it was found that two items under the communication skills construct obtained relatively low average I-CVI scores of 0.60: "I have active listening skills" and "I can give effective presentations." However, the researcher did not remove these two items, as they were deemed essential and aligned with the conceptual definition of communication skills. According to Fatin Izati & Khadijah (2022) and Noor Afzaliza Nazira & Maizatul Haizan (2021), the conceptual definition of communication refers to an individual's ability to convey ideas, share and exchange opinions, and interact with society. Azyani et al. (2019) and Siti Kausar & Mohd Noor (2021) also state that three characteristics of effective communication within soft skills are the ability to express ideas clearly and confidently, either in written or oral form; being an active listener who consistently provides feedback; and

delivering clear and confident presentations that suit the audience’s level. Therefore, these items were revised based on the feedback given by the evaluators. With the S-CVI score exceeding 0.80, the instrument is considered to have high content validity, and it is clear and relevant to the research objectives.

Instrument Reliability

The reliability test was conducted using Cronbach’s Alpha coefficient to assess the reliability level and internal consistency of the instrument. An analysis of each item in the instrument was conducted using the Statistical Package for the Social Sciences (SPSS) version 27.0 to obtain Cronbach’s Alpha value and the item-total correlation coefficients. Table 4 presents the Item-Total Correlation values and the Alpha-if-Item-Deleted values to interpret the relationships between items within the instrument.

Table 4
Item-Total Correlation Analysis and Alpha-if-Item-Deleted Values

Construct	Item No.	Item-Total Correlation	Cronbach’s Alpha if Item Deleted
Communication Skills	B1	0.412	0.751
	B2	0.435	0.751
	B3	0.439	0.748
	B4	0.461	0.746
Teamwork Skills	C5	0.453	0.748
	C6	0.506	0.743
	C7	0.135	0.771
	C8	0.356	0.755
Leadership Skills	D9	0.527	0.739
	D10	0.358	0.755
	D11	0.303	0.760
	D12	0.375	0.754
Critical Thinking and Problem-Solving Skills	E13	0.441	0.748
	E14	0.241	0.765
	E15	0.109	0.775
	E16	0.207	0.768

Referring to Table 4, the “Cronbach’s Alpha if Item Deleted” values ranged from 0.739 to 0.775, indicating acceptable internal consistency (Nurhafizah et al., 2024). This suggests a moderate level of reliability (Zuraini Hanim & Muhammad Izzat, 2021). The item-total correlation values for 12 items were above the minimum threshold of >0.30, as recommended by Hawker et al. (2008), indicating minimal redundancy and acceptable correlation between the items and the overall score. However, four items (C7, E14, E15, and E16) showed item-total correlation values below 0.30, suggesting weak correlations. Nevertheless, these items were retained based on their acceptable I-CVI values (C7 = 0.80; E14, E15, and E16 = 1.00). Instead of removing them, the items were refined in terms of wording and phrasing to ensure accurate construct measurement. These findings align with Tapsir et al. (2018), who state that an instrument is acceptable if most items correlate well with each other.

The overall Cronbach's Alpha coefficient for the 16-item instrument was 0.767, indicating a moderate but acceptable level of reliability. According to Stephen and Harry (2019), a reliability value between 0.50 and 0.80 is considered moderate and acceptable. Thus, this instrument is deemed suitable for actual data collection after refinement of the problematic items.

Conclusion

The primary objective of this study was to evaluate the validity and reliability of the soft skills instrument developed. The CVI-based content validity and Cronbach's Alpha reliability analysis formed the foundation of this evaluation. In conclusion, the findings confirm that the instrument possesses strong content validity and moderate internal consistency, making it appropriate for administration in the actual study. This instrument can serve as a valuable tool for teachers in assessing the extent to which lower secondary students apply soft skills throughout their teaching and learning process. Based on the identified constructs, teachers and school administrators can determine the types of activities or programs that can be implemented to enhance the practice of soft skills among students. Consequently, this can assist teachers in planning suitable activities to improve students' soft skills either in the classroom or through extracurricular activities. Such efforts serve as early preparation for students to enter the workforce, where they are expected to possess communication, interpersonal, leadership, and teamwork skills as required by today's employers (Sharifah Azizah & Haslinawati, 2018). Soft skills are essential to be instilled in students, as they are future competent workers expected to solve real-world problems aligned with the demands of the Fourth Industrial Revolution (IR 4.0). Future research should consider conducting exploratory factor analysis (EFA) to further validate the construct.

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