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# Development and Initial Psychometric Validation of an Employability Scale for Indonesian Deaf Students

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**Abstract.** This study addressed the assessment gap in special education by developing and validating a contextualized employability scale for deaf students framed within the USEM model (Understanding, Skills, Efficacy Beliefs, and Metacognition). Employing a Research and Development (R&D) design based on the Four-D (4D) model—encompassing the Define, Design, Develop, and Disseminate phases—the instrument underwent expert appraisal by panel members in guidance and counseling, special education, and psychology. Empirical evaluation involved a pilot trial ($n = 10$) and field testing with 40 deaf students attending Special Senior High Schools (SMALB). Content validity quantified via Aiken's V ranged from 0.83 to 1.00 across retained items, demonstrating high expert consensus. Item discrimination analysis using Corrected Item–Total Correlation (CITC) retained 22 of the original 30 items, removing eight items falling below the 0.30 threshold. The refined 22-item scale exhibited superior internal consistency reliability ($\alpha = .927$). These psychometric properties confirm that the scale is a valid and reliable assessment tool tailored to the communication and career development profiles of deaf learners, offering counselors and educators a robust instrument to optimize transition-to-work initiatives and vocational guidance.

**Keywords**: Deaf students; employability; psychometric validation; USEM framework; career guidance.

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## Introduction

Education plays a pivotal role in preparing students to live independently, including equipping them with the competencies required to enter the workforce. This objective applies not only to students without disabilities but also to all individuals, including those with special educational needs. Children with special needs are individuals who experience physical, sensory, intellectual, or developmental impairments that may affect their learning process and social participation. These impairments are generally categorized as disabilities (Ulfah & Ubaidah, 2023). According to the latest data from Statistics Indonesia (Badan Pusat Statistik 2026), there are approximately 1,544,184 children with disabilities in Indonesia. Of these, around 330,764 children (21.42%) are of school age (5–18 years), yet only 85,737 are enrolled in formal education. Furthermore, approximately 8.5 million persons with disabilities across all age groups remain below the poverty line (BPS, 2026). These figures indicate that persons with disabilities continue to face substantial barriers to accessing quality education, which ultimately limits their opportunities for successful participation in the labor market.

Among children with special needs, students with hearing impairments require particular attention during the transition from school to employment. Students with hearing impairments experience limitations in auditory functioning that affect their ability to receive spoken information and communicate verbally, although they are physically comparable to their hearing peers (Wahyudi et al., 2024). Hearing impairment is generally classified into two categories: hard of hearing and deaf. Individuals who are hard of hearing retain partial hearing ability and can usually access auditory information with the assistance of hearing aids. In contrast, deaf individuals experience profound hearing loss and are unable to comprehend spoken language through auditory input, even with hearing aids. Hearing loss is further classified according to the degree of auditory threshold loss, including mild (15–30 dB), moderate (31–60 dB), severe (61–90 dB), and profound (91–120 dB) impairment (Saleh, 2023). Hearing impairment is frequently accompanied by speech disorders resulting from limited auditory feedback during language development (Nofiaturrahmah, 2018).

The communication barriers experienced by students with hearing impairments extend beyond the educational setting and significantly influence their readiness to enter the workforce. Previous studies have consistently shown that deaf individuals encounter numerous challenges in obtaining and sustaining employment that matches their abilities and qualifications. These challenges include limited access to employment information, communication difficulties in the workplace, social adaptation barriers, restricted access to inclusive employment opportunities, and a mismatch between vocational education and labor market demands (Abdin & Tetelepta, 2021; D. Gunawan, 2012; Nursholichah et al., 2024; Pitaloca et al., 2023; Rosalina & Setiyowati, 2024; Saleh, 2023). Even after securing employment, many deaf workers continue to experience communication barriers with supervisors and colleagues because workplaces often lack adequate awareness of disability-related communication needs. These findings suggest that successful school-to-work transition depends not only on technical competencies but also on an individual's ability to adapt, collaborate, and continue developing within the workplace. Consequently, enhancing

employability should become a central objective of career guidance services and school-to-work transition programs for students with hearing impairments.

One of the most widely recognized concepts describing an individual's capacity to obtain and sustain employment is employability. Yorke defines employability as a set of achievements encompassing skills, knowledge, understanding, and personal attributes that enhance an individual's likelihood of gaining employment and succeeding in their career (Yorke & Knight, 2006; Yorke & Millar, 2003). Accordingly, employability extends beyond the ability to obtain an initial job, encompassing the capacity to adapt, develop, and make meaningful contributions throughout one's career. Similarly, Pool and Sewell conceptualize employability as a combination of knowledge, skills, experience, and reflective abilities that collectively facilitate long-term career success (Pool & Sewell, 2007).

Among the various theoretical frameworks of employability, the USEM model proposed by Knight and Yorke is considered one of the most comprehensive. The USEM framework conceptualizes employability as the integration of four interrelated dimensions: Understanding, Skills, Efficacy Beliefs, and Metacognition (Knight & Yorke, 2003; Yorke & Knight, 2006). Compared with other employability models, USEM places greater emphasis on reflective learning and self-efficacy, in addition to technical competence. These dimensions are particularly relevant for students with hearing impairments, who frequently encounter communication barriers and limited opportunities for social participation during the transition from education to employment.

Although the terms work readiness and employability are often used interchangeably, they represent distinct yet closely related constructs. Work readiness generally refers to an individual's preparedness to enter the workforce through the acquisition of the knowledge, skills, attitudes, and behaviors necessary to obtain initial employment. In contrast, employability encompasses a broader and more dynamic construct, referring not only to obtaining employment but also to sustaining employment, adapting to changing workplace demands, engaging in lifelong learning, and pursuing continuous professional development (Caballero et al., 2011; Pool & Sewell, 2007; Yorke & Knight, 2006). Therefore, this study conceptualizes employability as a multidimensional representation of work readiness among students with hearing impairments.

Despite its importance for successful school-to-work transition, the assessment of employability among students with hearing impairments remains underdeveloped. A comprehensive literature search conducted through Google Scholar, ScienceDirect, PubMed, and Scopus revealed that no employability scale has been specifically designed for students with hearing impairments. Most existing instruments have been developed for the general population, including university students, vocational education students, and employees. For example, Bennett and Ananthram developed an employability scale for university students in Australia, Rothwell and Arnold designed an employability instrument for employees in the United Kingdom, Fukuura et al. (2022) developed an instrument for individuals with mental health conditions, and Gunawan et al. proposed an employability scale for university students and adolescents (Bennett & Ananthram, 2022; Fukuura et al., 2022; W. Gunawan et al., 2018; Rothwell & Arnold, 2007).

**Table 1.** Comparison of Employability Measurement Instruments

| Author | Instrument | Population | Dimensions | Limitations |
|---|---|---|---|---|
| Rothwell & Arnold (2007) | *Self-Perceived Employability Scale (SPES)* | 200 employees in the United Kingdom | Perceived internal and external employment opportunities; individual value in the labor market | Developed for adult employees rather than students; does not consider the communication characteristics and school-to-work transition needs of students with hearing impairments. |
| Bennett & Ananthram (2022) | *Employability Scale* | Australian university students | Work readiness, professional skills, employability competencies, career development | Designed for higher education students assuming typical communication abilities; therefore, it is not suitable for students with hearing impairments in special education settings. |
| Fukuura et al. (2022) | *Employability Scale for Individuals with Mental Health Conditions* | Individuals with mental health conditions | Job retention, workplace adaptation, workplace support | Focuses on individuals with mental health conditions rather than sensory disabilities; does not accommodate the visual communication needs of students with hearing impairments. |
| W. Gunawan et al. (2018) | *Employability Scale* | Adolescents and university students | Work competencies, career readiness, adaptability | Developed for the general population without considering the linguistic, communication, and learning characteristics of students with hearing impairments. |
| This Study | *USEM-Based Employability Scale for Students with Hearing Impairments* | Senior secondary students with hearing impairments (SMALB) | Understanding, Skills, Efficacy Beliefs, Metacognition (USEM) | Specifically developed to accommodate the communication characteristics of students with hearing impairments by using simplified language. The instrument underwent expert validation, item validity testing, and reliability testing, making it more appropriate for employability assessment in special education settings. |

Although these instruments have demonstrated satisfactory psychometric properties, they were developed under the assumption that respondents possess typical communication abilities. Consequently, they fail to accommodate the linguistic characteristics, educational experiences, and school-to-work transition challenges unique to students with hearing impairments. Applying these instruments directly to deaf students may therefore reduce measurement accuracy and threaten construct validity due to differences in language comprehension and communication modalities. To date, no standardized employability scale has been specifically developed for students with hearing impairments at the senior secondary special education level (SMALB).

To address this research gap, the present study aims to develop an employability scale specifically tailored to the characteristics of students with hearing impairments by adapting the USEM framework within the context of special education. The instrument was developed using simplified language that is more accessible to deaf students and underwent a rigorous psychometric evaluation, including expert validation, internal item validity analysis, and reliability testing. Consequently, this study introduces one of the first validated employability assessment instruments specifically designed for students with hearing impairments.

This study contributes to the literature in three significant ways. First, it develops one of the first employability scales specifically designed for students with hearing impairments based on the USEM framework. Second, it adapts employability indicators into language and contextual expressions that are more accessible and relevant to the communication characteristics and lived experiences of deaf students. Third, it provides preliminary psychometric evidence through expert validation, item validity analysis, and reliability testing. The resulting instrument is expected to serve as a valuable resource for school counselors, special education practitioners, and researchers in assessing employability and designing evidence-based career guidance and school-to-work transition programs for students with hearing impairments.

## Method

### Research Design

This study employed a Research and Development (R&D) design using the Four-D (4D) instructional development model proposed by Thiagarajan, Semmel, and Semmel (1974). The 4D model consists of four sequential stages: Define, Design, Develop, and Disseminate, and has been widely adopted for the systematic development of educational products and research instruments because it provides a structured procedure for producing valid and reliable products (Thiagarajan et al., 1974).

The Define stage aimed to identify the need for an employability assessment instrument for deaf students. This stage involved a literature review on employability, career development, and special education, as well as a needs assessment through interviews with guidance and counseling teachers at Special Senior High Schools (SMALB) to explore students' employability characteristics, career barriers, and transition needs.

The Design stage focused on preparing the employability instrument blueprint based on the USEM framework proposed by Yorke and Knight, consisting of four dimensions: Understanding, Skills, Efficacy Beliefs, and Metacognition (Yorke & Knight, 2006; Yorke & Millar, 2003). Based on these dimensions, an initial pool of 30 items was developed using a five-point Likert response format.

The Develop stage consisted of expert content validation, instrument revision, pilot testing, field testing, and psychometric evaluation. Content validity was evaluated by experts in guidance and counseling, special education, and psychology using Aiken's V coefficient. The revised instrument was subsequently administered to deaf students to evaluate item validity and internal consistency reliability.

The Disseminate stage involved preparing the finalized employability scale for implementation in guidance and counseling services and dissemination through scientific publication. In the present study, dissemination was limited to reporting the validated instrument as an initial employability assessment tool for deaf students.

**Participants**

The participants consisted of three groups. First, three expert validators participated in the content validation process, comprising one expert in guidance and counseling, one expert in special education, and one expert in psychology. The experts evaluated each item in terms of relevance, clarity, representativeness, language appropriateness, and suitability for measuring employability among deaf students.

Second, the pilot study involved 10 deaf students enrolled at SLB Cinta Ananda Sumenep. The pilot study was conducted to evaluate the clarity, comprehensibility, readability, and preliminary psychometric performance of the developed instrument before large-scale administration. The pilot testing was undertaken at the intended research site because the employability scale constituted part of the author's master's thesis. Since the total number of deaf students at the senior high school level in the institution was only ten, the entire accessible population participated in the pilot study. Such a sample size is considered appropriate because pilot studies primarily aim to assess the feasibility and quality of research instruments rather than to estimate population parameters (Johanson & Brooks, 2010).

Third, field testing involved 40 deaf students enrolled in Special Senior High Schools (SMALB). The field test was conducted to examine the psychometric characteristics of the employability scale, including internal item validity and internal consistency reliability.

**Participant Recruitment Procedure**

Expert validators were selected using purposive sampling based on their academic qualifications, professional expertise, and experience in guidance and counseling, special education, and psychology.

Participants involved in the pilot study were selected purposively because the study constituted part of the author's master's thesis conducted at SLB Cinta Ananda Sumenep. All senior high school deaf students enrolled at the school were invited to participate in order to evaluate the comprehensibility and practicality of the instrument prior to large-scale testing.

Participants for the field test were recruited through purposive sampling using online questionnaire distribution via WhatsApp communities of deaf education networks (Sahabat Tuli), guidance and counseling teachers, and special education teachers. The questionnaire introduction clearly specified the inclusion criteria, namely: (a) officially enrolled as a deaf student at a Special Senior High School (SMALB); (b) able to communicate using Indonesian Sign Language (BISINDO) and or written Indonesian; (c) willing to participate voluntarily; and (d) completing the questionnaire with assistance from a parent, guardian, or teacher when necessary. Only participants meeting all inclusion criteria were eligible to complete the questionnaire.

## Research Instruments

Three instruments were employed in this study.

Expert Validation Form

The expert validation form was developed to evaluate the content validity of the employability scale. Experts assessed each item in terms of content relevance, language clarity, construct representativeness, response suitability, and appropriateness for deaf students.

Employability Scale for Deaf Students

The employability scale was developed based on the USEM framework proposed by Yorke and Knight (Yorke & Knight, 2006; Yorke & Millar, 2003), consisting of four dimensions: Understanding, Skills, Efficacy Beliefs, and Metacognition. The initial instrument consisted of 30 items using a five-point Likert response scale ranging from strongly disagree to strongly agree.

Needs Assessment Interview Guide

A semi-structured interview guide was employed during the Define stage to identify employability needs, career barriers, and school-to-work transition challenges experienced by deaf students. Interviews were conducted with guidance and counseling teachers working in Special Senior High Schools (SMALB).

## Data Analysis

Content validity was evaluated using Aiken's V coefficient based on expert judgments. Following Aiken (1985), Aiken's V values of 0.80 or above were interpreted as indicating satisfactory content validity, values between 0.60 and 0.79 indicated acceptable validity requiring revision, whereas values below 0.60 indicated inadequate content validity.

Internal item validity was evaluated using the Corrected Item–Total Correlation (CITC) obtained through Cronbach's alpha analysis. Items with CITC values of 0.30 or higher were considered to demonstrate satisfactory internal validity (Adeniran, 2025; Aiken, 1985; DeVillis & Thorpe, 2022; Dwi Kusumasari et al., 2025).

Internal consistency reliability was assessed using Cronbach's alpha coefficient. Reliability coefficients were interpreted as follows: ≥0.90 = excellent, 0.80–0.89 = good, 0.70–0.79 = acceptable, 0.60–0.69 = questionable, and <0.60 = poor (Adeniran, 2025; Aiken, 1985; DeVillis & Thorpe, 2022; Dwi Kusumasari et al., 2025).

**Table 2.** Criteria for Interpreting Aiken's V and Cronbach's Alpha

| Aiken's V | Interpretation | Cronbach's Alpha | Interpretation |
|---|---|---|---|
| 0.80–1.00 | Valid | ≥ 0.90 | Very High |
| 0.60–0.79 | Valid with revisions | 0.80–0.89 | High |
| < 0.60 | Invalid | 0.70–0.79 | Fair |
| | | 0.60–0.69 | Moderate |
| | | < 0.60 | Low |

### Ethical Considerations

This study was conducted in accordance with the ethical principles governing research involving human participants. As the study involved the development and validation of a non-clinical and non-invasive educational instrument, all procedures were designed to minimize potential risks to participants.

For the pilot study, official permission to conduct the research was obtained from SLB Cinta Ananda Sumenep through the research permit issued by Universitas Negeri Malang (Letter No. 18.5.1/UN32.1.1/KM/2026) and the Certificate of Research Completion issued by the school (Letter No. 359/SLB-CA+/VII/2026). Participation was voluntary, and all deaf students participated with the approval of the school authorities and accompanying teachers. Participant identities were anonymized through digital coding to ensure confidentiality.

For the fieldtesting phase, data were collected through an online questionnaire distributed via WhatsApp communities of deaf education networks. Before accessing the questionnaire, participants were provided with an information sheet explaining the objectives of the study, inclusion criteria, voluntary participation, confidentiality of responses, and the right to withdraw from the study at any time without penalty. Because most participants were minors, questionnaire completion was conducted under the supervision of parents, guardians, or teachers when necessary. Submission of the completed questionnaire was regarded as informed consent to participate in the study. No personally identifiable information was collected, and all data were analyzed anonymously.

## Results

### Result of Instrument Development

The preliminary needs assessment indicated a lack of appropriate instruments for comprehensively assessing the employability of deaf students. This finding was based on interviews conducted with guidance and counseling teachers in special education schools (SLB) (Triswati et al., 2025), as well as a review of the relevant literature. The literature review revealed that although several employability scales have been developed for hearing students, including those in vocational high schools (SMK) and vocational senior high schools (Munadi et al., 2018; Tentama & Dyah Anindita, 2020), no instrument has been specifically designed to measure employability among deaf students. This gap highlights the need for a valid and reliable instrument tailored to the unique characteristics and career development needs of deaf learners. Therefore, this study developed an employability scale for deaf students based on the USEM model proposed by Knight and Yorke (Yorke & Millar, 2003), which comprises four dimensions: understanding, skills, efficacy beliefs, and metacognition.

The initial employability scale consisted of 30 items distributed across the four dimensions of the USEM framework. The number of items allocated to each dimension was not intended to be identical but rather reflected the conceptual breadth of each construct and the number of behavioral indicators identified during the instrument development process. Specifically, the Understanding and Metacognition dimensions each comprised eight items because these domains encompass a broader range of indicators related to knowledge

of the workplace, work ethics, career awareness, self-reflection, and career planning. In contrast, the Skills and Efficacy Beliefs dimensions each consisted of seven items because fewer distinct indicators were identified from the literature and needs assessment. Therefore, the distribution of items was determined by theoretical considerations rather than by the intention to produce an equal number of items across dimensions (Boateng et al., 2018; DeVillis & Thorpe, 2022). The framework of the proposed employability scale is presented below.

**Table 3.** Employability Instrument Blueprint

| No | USEM Component | Indicator | Purpose of Measurement | Item Number | | Total |
|---|---|---|---|---|---|---|
| | | | | F | U | |
| 1 | *Understanding* | a. Understanding of the workplace and different types of jobs<br>b. Awareness of work values and ethics<br>c. Understanding of job responsibilities | Assessing students' conceptual understanding of the working world | 1,3, 5,7 | 2,4, 6,8 | 8 |
| 2 | *Skills* | a. Technical skills relevant to the vocational field (design, culinary arts, fashion, ICT, etc.)<br>b. Social and visual communication skills using BISINDO<br>c. Ability to work collaboratively in a team | Assessing practical skills and social interaction in the workplace | 9,11, 13,15 | 10,12, 14 | 7 |
| 3 | *Efficacy Beliefs* | a. Belief in one's ability to complete tasks<br>b. Self-confidence in facing the challenges of the workplace<br>c. Motivation for self-development | Assessing students' self-efficacy in preparing for the workforce | 16,18, 20,22 | 17,19, 21 | 7 |
| 4 | *Metacognition* | a. The ability to reflect on learning outcomes and experiences<br>b. The ability to create a personal career plan<br>c. Awareness of one's strengths and weaknesses | Measuring students' reflective awareness of career and personal development | 23,25, 27,29 | 24,26, 28,30 | 8 |
| | | | | | **Total** | 30 |

The unequal number of items across dimensions is common in instrument development because each construct may differ in conceptual complexity and indicator coverage. Scale development guidelines recommend that item allocation should follow theoretical representation of the construct rather than numerical equality across dimensions (Boateng et al., 2018; DeVillis & Thorpe, 2022).

**Expert Validation Results**

The content validity of the employability scale was evaluated by three expert validators using Aiken's V. The experts assessed each item based on six evaluation criteria: content relevance, language clarity, construct representativeness, psychometric and ethical considerations, response scale appropriateness, and cultural relevance, using a five-point Likert scale (1 = very inappropriate to 5 = very appropriate). The results indicated that the instrument demonstrated a high level of content validity, suggesting that the items were relevant and representative of the intended construct. A summary of the expert validation results is presented in Table:

**Table 4**. Results of Expert Validation

| No Item | V | Note |
|---|---|---|
| 1 | 0,917 | Valid |
| 2 | 0,903 | Valid |
| 3 | 0,917 | Valid |
| 4 | 0,722 | Valid with revision |
| 5 | 0,917 | Valid |
| 6 | 0,903 | Valid |
| 7 | 0,833 | Valid |
| 8 | 0,917 | Valid |
| 9 | 0,917 | Valid |
| 10 | 0,819 | Valid |
| 11 | 0,833 | Valid |
| 12 | 0,833 | Valid |
| 13 | 0,917 | Valid |
| 14 | 0,833 | Valid |
| 15 | 0,833 | Valid |
| 16 | 0,833 | Valid |
| 17 | 0,833 | Valid |
| 18 | 0,833 | Valid |
| 19 | 0,917 | Valid |
| 20 | 0,917 | Valid |
| 21 | 0,833 | Valid |
| 22 | 0,875 | Valid |
| 23 | 0,917 | Valid |
| 24 | 0,917 | Valid |
| 25 | 0,917 | Valid |
| 26 | 0,917 | Valid |
| 27 | 0,917 | Valid |
| 28 | 0,889 | Valid |
| 29 | 0,917 | Valid |
| 30 | 0,917 | Valid |

Based on the results presented in Table 3, the employability scale demonstrated acceptable content validity, with all items meeting the predetermined Aiken's V validity criterion. Although the overall validity was satisfactory, the expert validators provided several recomendations regarding item wording, clarity, and content relevance. These suggestions were incorporated into the revision process to improve the quality and comprehensibility of the instrument. The revisions made based on the experts' feedback are summarized below.

**Table 5.** Item of the employability scale

| No | Statement |
|---|---|
| 1 | I know the different types of jobs that are suitable for me. |
| 2 | I do not understand the differences between job types. |
| 3 | I understand the importance of work values and ethics. |
| 4 | I do not pay enough attention to applicable workplace rules. |
| 5 | I know the main responsibilities of the job. |
| 6 | I am confused about the tasks involved in the job. |
| 7 | I understand the tasks and responsibilities expected of workers in a specific field. |
| 8 | I have no idea about the working world. |
| 9 | I am able to perform technical skills related to my major. |
| 10 | I have difficulty completing technical tasks in the skill area I've studied. |
| 11 | I can communicate clearly using Indonesian Sign Language during work activities or internships. |
| 12 | I have difficulty communicating during work activities even when using Indonesian Sign Language. |
| 13 | I am able to work collaboratively in a group. |
| 14 | I have difficulty working collaboratively in a work team. |
| 15 | I can understand and carry out work instructions well. |
| 16 | I am confident I can complete work tasks based on my abilities. |
| 17 | I find it difficult to complete work tasks independently. |
| 18 | I am confident in facing challenges during work activities or work placements. |
| 19 | I give up easily when tasks feel difficult. |
| 20 | I am motivated to improve my work skills. |
| 21 | I am not confident in my ability to perform well at work. |
| 22 | I feel capable of meeting job demands based on my abilities. |
| 23 | I am able to evaluate work results |
| 24 | I rarely reflect on the work I've already done. |
| 25 | I have a career plan for the future. |
| 26 | I don't yet have a clear career plan. |
| 27 | I know my strengths that are useful for work. |
| 28 | I don't know what I need to improve to be better prepared for work. |
| 29 | I can think of ways to improve my work skills. |
| 30 | I rarely reflect on my skills or my work. |

**Table 6.** Item Total Statistics Internal Item Validity

| Item | Corrected Item-Total Correlation |
|---|---|
| X1.1 | 0.735 |
| X1.2 | 0.706 |
| X1.3 | 0.660 |
| X1.4 | 0.480 |
| X1.5 | 0.458 |
| X1.6 | 0.351 |
| X1.7 | 0.709 |
| X1.8 | 0.291 |
| X1.9 | 0.930 |
| X1.10 | 0.131 |
| X1.11 | 0.843 |
| X1.12 | 0.163 |

| Item | Corrected Item-Total Correlation |
|---|---|
| X1.13 | 0.068 |
| X1.14 | 0.675 |
| X1.15 | 0.352 |
| X1.16 | 0.075 |
| X1.17 | 0.117 |
| X1.18 | 0.526 |
| X1.19 | 0.815 |
| X1.20 | 0.386 |
| X1.21 | 0.411 |
| X1.22 | 0.132 |
| X1.23 | 0.864 |
| X1.24 | 0.402 |
| X1.25 | 0.755 |
| X1.26 | 0.047 |
| X1.27 | 0.742 |
| X1.28 | 0.402 |
| X1.29 | 0.613 |
| X1.30 | 0.574 |

**Table 7.** Reliability Statistics

| Cronbach's Alpha | N of Items |
|---|---|
| 0,900 | 30 |

The internal validity of the employability scale was evaluated using the Corrected Item–Total Correlation (CITC) analysis. Following the recommended criterion of CITC ≥ 0.30 (DeVillis & Thorpe, 2022), 22 of the initial 30 items demonstrated satisfactory item discrimination and were considered valid. The remaining eight items (X1.8, X1.10, X1.12, X1.13, X1.16, X1.17, X1.22, and X1.26) failed to meet the minimum criterion, with CITC values ranging from 0.047 to 0.291. Consequently, these items were removed from the instrument to improve its psychometric quality. The retained 22 items adequately represented the employability construct and demonstrated satisfactory internal validity.

The internal consistency reliability of the initial 30-item instrument was first evaluated using Cronbach's alpha, yielding a coefficient of 0.900, indicating excellent internal consistency. Following the removal of the eight items that did not satisfy the CITC criterion, the reliability analysis was recalculated using the remaining 22 items. The revised employability scale produced a Cronbach's alpha coefficient of 0.927, indicating excellent internal consistency reliability (Hair et al., 2019). The increase in Cronbach's alpha following item removal suggests that eliminating poorly discriminating items improved the homogeneity of the instrument while maintaining adequate representation of the employability construct. Therefore, the final 22-item employability scale demonstrated satisfactory psychometric properties and was considered appropriate for assessing employability among deaf students.

**Table 8.** Reliability Statistics

| Cronbach's Alpha | N of Items |
|---|---|
| 0,927 | 22 |

**Table 9.** valid items of the employability scale

| No | Statement |
|---|---|
| 1 | I know the different types of jobs that are suitable for me. |
| 2 | I do not understand the differences between job types. |
| 3 | I understand the importance of work values and ethics. |
| 4 | I do not pay enough attention to applicable workplace rules. |
| 5 | I know the main responsibilities of the job. |
| 6 | I am confused about the tasks involved in the job. |
| 7 | I understand the tasks and responsibilities expected of workers in a specific field. |
| 8 | I am able to perform technical skills related to my major. |
| 9 | I can communicate clearly using Indonesian Sign Language during work activities or internships. |
| 10 | I have difficulty working collaboratively in a work team. |
| 11 | I can understand and carry out work instructions well. |
| 12 | I am confident in facing challenges during work activities or work placements. |
| 13 | I give up easily when tasks feel difficult. |
| 14 | I am motivated to improve my work skills. |
| 15 | I am not confident in my ability to perform well at work. |
| 16 | I am able to evaluate work results |
| 17 | I rarely reflect on the work I've already done. |
| 18 | I have a career plan for the future. |
| 19 | I know my strengths that are useful for work. |
| 20 | I don't know what I need to improve to be better prepared for work. |
| 21 | I can think of ways to improve my work skills. |
| 22 | I rarely reflect on my skills or my work. |

## Discussion

The present study aimed to develop and validate an employability scale specifically designed for deaf students based on the USEM framework. The findings demonstrate that the developed instrument possesses satisfactory psychometric properties, as evidenced by strong content validity, acceptable internal item validity, and excellent internal consistency reliability. All retained items achieved Aiken's V coefficients above 0.80, indicating a high level of expert agreement regarding the relevance and representativeness of the instrument items. According to Aiken, values above 0.80 indicate that the items adequately represent the intended construct and are suitable for measuring the target domain. This finding suggests that the employability construct derived from the USEM framework can be appropriately operationalized within the context of deaf students (Aiken, 1985).

The high Aiken's V coefficients also provide practical evidence that experts from guidance and counseling, special education, and psychology shared a consistent understanding of the conceptual relevance of the developed items. Such consistency is particularly important because employability among deaf students requires the integration of

career development theory with the unique educational and communication characteristics of this population (Boateng et al., 2018; DeVillis & Thorpe, 2022).

One of the major contributions of this study lies in the linguistic and contextual adaptation of the employability scale for deaf students. Rather than directly adopting employability scales developed for hearing populations, the instrument was reconstructed using language that was simpler, more concrete, and closely related to students' everyday experiences. For example, abstract expressions such as career adaptability, professional competence, or occupational self-efficacy were transformed into observable workplace situations, including understanding work instructions, communicating through Indonesian Sign Language (BISINDO), collaborating with coworkers, and planning future careers. Such contextualization was intended to reduce linguistic ambiguity while maintaining the conceptual meaning of each USEM dimension.

The comprehensibility of the instrument was further examined during the pilot study involving ten deaf students. The pilot testing indicated that although most items were understood appropriately, several participants required clarification regarding instructions and certain statements. These observations resulted in revisions to item wording before field testing. Therefore, the pilot study served not only as a preliminary psychometric evaluation but also as an important step in establishing language accessibility for the target population.

Although the instrument demonstrated satisfactory psychometric properties, the administration process revealed several practical considerations. Some participants required assistance from teachers or parents when completing the questionnaire, particularly in interpreting abstract statements concerning self-confidence and self-reflection. This finding should not necessarily be interpreted as evidence of poor instrument quality. Instead, it reflects the linguistic diversity and communication characteristics commonly observed among deaf students, whose language acquisition often differs from that of hearing students (Marschark & Hauser, 2012).

Nevertheless, this finding indicates that standardized administration procedures are essential for ensuring consistent data collection. Future implementation of the employability scale should therefore include clear administration guidelines, visual explanations, or BISINDO-supported instructions to minimize misunderstanding while maintaining the independence of participants' responses.

The present findings also support the applicability of the USEM framework proposed by Yorke and Knight (2006) for assessing employability among deaf students. Rather than functioning as separate dimensions, Understanding, Skills, Efficacy Beliefs, and Metacognition represent interrelated competencies that collectively facilitate successful school-to-work transition. Understanding provides knowledge about occupations and workplace expectations, which forms the basis for developing vocational skills. These skills subsequently contribute to stronger efficacy beliefs, enabling students to perform work-related tasks with confidence. Metacognition complements these dimensions by encouraging students to reflect on their strengths, weaknesses, and future career plans.

This interpretation is also consistent with Social Cognitive Career Theory (SCCT), which emphasizes that self-efficacy beliefs influence career behaviors through interactions among learning experiences, environmental support, and outcome expectations (Lent et al., 1994).

Likewise, Self-Determination Theory suggests that autonomy, competence, and relatedness contribute to career motivation and long-term employability (Ryan & Deci, 2000). Therefore, the USEM framework provides an appropriate conceptual foundation for integrating cognitive, behavioral, and motivational aspects of employability among deaf students.

The internal item analysis resulted in the exclusion of Items X1.13, X1.16, and X1.17 because they demonstrated low corrected item–total correlation values. Although these items theoretically represented collaboration and self-efficacy, their statistical performance suggested inconsistent interpretation among respondents. Item X1.13 ("I am able to work collaboratively in a group") may have been influenced by differences in students' opportunities to participate in collaborative workplace or classroom activities, leading to variability unrelated to employability itself. Meanwhile, Items X1.16 ("I am confident I can complete work tasks based on my abilities") and X1.17 ("I find it difficult to complete work tasks independently") required respondents to evaluate abstract psychological concepts such as confidence and independence. Previous studies have shown that deaf students may interpret abstract self-evaluative statements differently because of variations in language acquisition, communication experiences, and vocational exposure (Bandura, 1997; Marschark & Hauser, 2012). Consequently, removing these items improved the internal homogeneity of the scale while preserving the theoretical representation of the USEM dimensions.

From a practical perspective, the employability scale offers guidance and counseling teachers a standardized assessment tool for identifying students' employability profiles across the four USEM dimensions. Assessment results may support the development of individualized career guidance programs, transition planning, vocational counseling, and evaluation of career readiness interventions for deaf students. Furthermore, because the instrument was specifically adapted to the communication characteristics of deaf learners, it provides a more contextually appropriate alternative to employability measures originally developed for hearing populations.

Despite these promising findings, this study has several limitations. The psychometric evaluation was conducted using a relatively limited sample, and the validation focused primarily on content validity and internal consistency reliability. Future research should examine additional psychometric properties, such as construct validity through exploratory and confirmatory factor analyses, test–retest reliability, and criterion-related validity using larger and more diverse samples. Such investigations would provide stronger empirical evidence for the scale's broader applicability across different educational contexts. Future studies are encouraged to examine construct validity using exploratory and confirmatory factor analyses, evaluate measurement invariance across educational settings, and investigate test–retest reliability to strengthen the robustness of the employability scale.

**Novelty of the Research**

The present study contributes to the field of career development and special education by developing an employability scale specifically adapted for deaf students using the USEM framework (Understanding, Skills, Efficacy Beliefs, and Metacognition). A review of the existing literature indicates that most employability instruments have been developed for hearing adults, university students, or vocational education students (Munadi et al., 2018;

Rothwell & Arnold, 2007; Tentama & Anindita, 2020). These instruments generally assume typical spoken-language communication and do not explicitly consider the communication characteristics, language accessibility, and school-to-work transition experiences of deaf learners.

Unlike previous employability measures, the present instrument was developed specifically for deaf students by adapting both the content and language of the items to their communication characteristics. The development process incorporated expert validation involving specialists in guidance and counseling, special education, and psychology, followed by pilot testing and psychometric evaluation to ensure that the instrument was conceptually relevant, linguistically accessible, and appropriate for the target population. Therefore, rather than merely adapting an existing employability scale, this study provides initial empirical evidence for a context-specific employability instrument that supports career assessment among deaf students.

**Implications and Contributions**

The findings of this study have both theoretical and practical implications. Theoretically, the study extends the application of the USEM model to the context of deaf students, demonstrating that the four dimensions of understanding, skills, efficacy beliefs, and metacognition provide an appropriate conceptual framework for measuring employability within special education settings. This contributes to the limited body of research on employability assessment for students with disabilities.

Practically, the developed scale provides guidance and counseling teachers, special education practitioners, and researchers with a standardized instrument for assessing employability among deaf students. The instrument can be used to identify students' strengths and developmental needs, evaluate the effectiveness of career guidance and transition programs, and support the design of individualized interventions that facilitate successful school-to-work transitions. In addition, the scale offers a foundation for future research on employability and career readiness among students with disabilities.

**Research Limitations**

This study has several limitations. First, the psychometric evaluation was conducted using a relatively small sample from a limited number of special education schools, which may restrict the generalizability of the findings. Second, the validation focused on content validity, internal item validity, and internal consistency reliability, while other important psychometric properties, including construct validity (EFA/CFA), criterion-related validity, discriminant validity, and test–retest reliability, were not examined. Third, although the instrument was linguistically adapted for deaf students, some participants required assistance during administration, highlighting the need for standardized administration procedures. In addition, normative data and score interpretation guidelines have not yet been established. Future studies are therefore recommended to recruit larger and more representative samples, examine additional forms of validity and reliability, establish normative score categories, and evaluate the stability of the instrument over time.

## Conclusion

This study successfully developed and provided initial validation of an employability scale specifically designed for deaf students based on the USEM framework, encompassing the dimensions of Understanding, Skills, Efficacy Beliefs, and Metacognition. The findings demonstrate that the instrument possesses satisfactory content validity and excellent internal consistency reliability, indicating that it is suitable for assessing employability among deaf students. Following psychometric evaluation, the final instrument consisted of 22 valid items that adequately represent the employability construct.

The developed scale addresses the lack of standardized employability assessment instruments tailored to the characteristics and communication needs of deaf students. By providing a psychometrically sound and contextually relevant instrument, this study contributes to the assessment of career readiness and supports the implementation of evidence-based career guidance and transition programs in special education settings.

Future research is recommended to further examine the psychometric properties of the instrument using larger and more diverse samples. Additional validation studies, including exploratory and confirmatory factor analyses, criterion-related validity, test–retest reliability, and cross-cultural validation, are needed to strengthen the instrument's applicability across different educational contexts. Such efforts will enhance the utility of the employability scale for research, educational practice, and career development programs for deaf students.

## Author Contributions

EM conceived the study, designed the research methodology, developed the instrument, collected and analyzed the data, interpreted the findings, and prepared the original manuscript. MS supervised the research process, contributed to the conceptualization of the study, provided methodological guidance, critically reviewed the manuscript, and approved the final version. IMH supervised the research, contributed to the theoretical framework and interpretation of the findings, critically revised the manuscript for important intellectual content, and approved the final version of the manuscript. All authors read and approved the final manuscript.

## Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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