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Chapter 8

Life Skill Training in Technical and Vocational Education Training High Schools in Iran: A Multi-method Qualitative Approach Based on Entropy

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Abstract: The current study sought to determine to what extent Technical and Vocational Education and Training (TVET) textbooks in Iran incorporate the 10 basic life skills recommended by the World Health Organization (WHO) and how this varies across the three dimensions of competency (knowledge, skill, and attitude). This investigation examined the content of textbooks in TVET of Iran based on the 10 basic life skills recommended by the WHO (i.e., problem-solving, critical thinking, effective communication skills, decision-making, creative thinking, interpersonal relationship skills, self-awareness building skills, empathy, coping with stress and coping with emotions). Employing a multi-method approach, the current research utilized documentary research to extract themes, the Delphi method to prioritize the themes, and content analysis through Shannon's entropy method to examine the themes about life skills. The qualitative step involved documentary analysis and the Delphi method, where experts reviewed frameworks and selected the WHO framework for analysis. The quantitative step involved using Shannon's entropy method for data analysis to measure the amount of uncertainty or randomness in the data. The Delphi method was employed to gather expert opinions and reach a consensus on the current implementation of life skills in the textbooks. Shannon's entropy measure was used as an information index weight in ranking methods considering its ability to quantify uncertainty and probability. The results showed that at the level of knowledge, the highest degree of attention was paid to problem-solving (16.9%), while coping with stress and self-awareness received the least attention (2.8%). Problem-solving (17.3%), again, received the most attention at the skill level, while coping with stress received the least (3.4%). The most emphasis was allocated to critical thinking (16.1%) at the attitude level, whereas coping with stress, self-awareness, and empathy received the least (6%). The level of knowledge was determined to have included more examples of life skills than the other two levels. In general, it can be argued that intraindividual skills such as self-awareness and coping with emotions have received less attention in textbooks. However, regulatory, and personal skills, which are characterized as problem-solving and critical thinking, have received more attention. In addition, the caveat that life skills with higher frequency in the TVET textbooks may not always have larger information index and importance degrees, should be kept in mind. The obtained results can be employed by curricula planners to rectify and revise the imbalance between various life skills as manifested in the TVET curricula.

Keywords: WHO life skills, technical and vocational education training, qualitative approach, high school curricula, non-technical competencies, Iran

Introduction

Individuals start to take their lives seriously during the years of adolescence and early adulthood, and it is typically the time to learn more about life skills. Teenagers and young people who are preparing to enter society face a number of hazards; yet, if they have acquired decent life skills, they may navigate through this phase without/with-fewer mishaps. Otherwise, they may suffer from a range of interpersonal/intrapersonal problems that will have an enduring impact on their lives (Jones & Lavallee, 2009). Positive Youth Development (PYD) is a crucial approach to youth development, particularly during adolescence (Blyth, 2006; Bonell et al., 2016; Gavin et al., 2010; Ma, 2012). PYD emerged in the 1980s as a critique of the "deficiency models of adolescence," which focused on addressing negative behaviors rather than promoting healthy development (Lerner, 2004, 2006). While it can be leveraged for resource investing, it is also associated with a decrease in psychosocial disorders, which calls for efficient management. PYD emphasizes the strengths and assets of youth, and its goal is (I) to promote cognitive, social, emotional, and behavioral competence, self-efficacy, belonging, spirituality, and empowerment (Bowers et al., 2010; Catalano et al., 2002). (II) Help young people access essential developmental assets (Catalano et al., 2004), allowing them to flourish, contribute to their environment, and reduce the likelihood of engaging in risk behaviors (Ciocanel et al., 2017; Wiium et al., 2019). The potential rewards of funding PYD initiatives are substantial, and multiple countries have made considerable expenditures (Catalano et al., 2002, 2019; Zhu & Shek, 2020). PYD has been studied extensively over the past 35 years, and a large body of literature explores its various aspects, including contextual factors, social environments, and its effects on social outcomes. The growing interest of international organizations in PYD research reaffirms its importance in global youth development. Various reliable tools and models have been designed and utilized to investigate and measure PYD comprehensively. Several models of PYD have been proposed, such as Benson's model of external and internal developmental assets (Benson, 2007), Lerner's 5Cs/6Cs model (Lerner, 2009), Catalano's 15 PYD constructs (Catalano et al., 2003) and social-emotional learning models (SEL). These models emphasize a similar path while using slightly different properties. Over the past 35 years, a large body of literature has investigated various aspects and dimensions of the PYD

(Mansfield et al., 2020; Qi et al., 2020), including its link to contextual factors and social outcomes such as academic achievements, social and/or life skills, and reduction in violence and substance use (Duncan & Raudenbush, 1999; Wiium et al., 2019). Various valid and reliable tools have been designed and translated to measure PYD in different contexts (Klein et al., 2006; Shek & Ma, 2014; Sieng et al., 2018). Additionally, there is growing research focusing on the effects of PYD on social outcomes. Academic achievements (Beck & Wiium, 2019; Chase et al., 2015), social skills (Shek & Ma, 2014), reduction in violence and substance use (Bonell et al., 2016) are among the most frequently studied outcomes. PYD has become an important approach in promoting youth well-being globally, and many countries and international organizations have invested in PYD programs to help young people flourish and contribute to their environment.

I. The Emergence of Life Skills Training (LST)

For many years, it was believed that one should experience life and gradually learn how to live, but the complexity of life characteristic of today's industrial, high-tech, and rapidly changing world has made it vital to learn life skills in the form of formal and informal education and through curricula (Botvin, 1996; Prajapati et al., 2017). The discourse upon life skills training (LST) emerged gradually in the 1970s, and it is believed that the movement originated as a result of Botvin and colleagues' studies (1996; 1980, 1984, 1990, 1995), claiming the potential effects of LST on controlling risk behaviors among youth to some extent (Mandel et al., 2006; Nasheeda et al., 2019).

II. Definition and Benefits of Life Skills Training

The basic theory of the LST and the concept of self-empowerment is the idea that skills can be acquired, adjusted, and improved and that it is possible to support individuals in their progress by helping them overcome life's obstacles (Brownell et al., 1996). A life skill is defined as an individual's ability to conduct adaptive and positive behavior in order to cope with challenges and necessities of daily life. Hence, the LST can be defined as learning the abilities that lead to mental health improvement, human relationship enrichment, healthy behavior development in society, risk-taking reduction, and

resilience mechanism (Botvin, 1985; Sisselman-Borgia, 2021; Yadav & Iqbal, 2009). According to Rani and Neeraj (2020), through instruction and practical application in daily life, students can learn these skills. Students who have acquired life skills are better able to think creatively and solve problems in real-world situations, regulate their behavior, make wise decisions, and develop positive values (Prajapati et al., 2017). It also teaches students how to interact socially, build friendships, and understand how their actions and behaviors affect others (Scheibe & Barrett, 2017).

III. Effectiveness of Life Skills Training

The LST is an effective approach in primary prevention due to its interactive and activity-based nature, and it uses the problem-solving approach (Caplan et al., 1992; Hawkins & Weis, 2017; Hooman et al., 2013). The LST, which is considered an effective intervention strategy to enhance positive social and psychological health among teenagers, plays an important role in all aspects, including strengthening coping strategies, self-confidence, and emotional intelligence (Prajapati et al., 2017).

Teaching Life Skills in Education

Regarding LST, multiple questions about the life skills that can be taught to students, at what age, and in what training programs have come to light. Different researchers have provided varying responses to this query. There is ample evidence showing that life skills can be effectively taught to students in the elementary (Bwayo, 2014; Gim, 2021), secondary (Wei et al., 2022), and even at the university levels (Gupta, 2021). According to Prajapati et al. (2017), a socially effective education system must respond quickly and effectively to the challenge of inculcating life skills. Although "education" is essential, education that helps people to live better is more crucial. Life skills training is thought to reduce the discrepancy between fundamental ability and functionality. It improves a person's capacity to respond to the requirements of contemporary society and aids in handling problems in a way that makes desirable behavior practicable. Youth may tackle life challenges by receiving life skill training via the life skill education (Prajapati et al., 2017). Up until now, numerous curricula programs have attempted to instill life skills,

and the results have been encouraging. For instance, the Positive Adolescents Life Skills (PALS) training program has demonstrated the potential to lower risk-taking behaviors in impoverished, urban, and minority adolescent populations (Tuttle et al., 2006). The LST is helpful in various areas, such as dealing with drug abuse (Darharaj et al., 2023; Pyrkosch et al., 2022), improving skill-related training (Auapisithwong et al., 2022), helping intellectually disabled students (Bouck, 2010), reducing risk behaviors (Caldwell et al., 2004), improving self-esteem and anxiety behaviors (Ebrahem et al., 2022), empowering individuals (Dixon, 2016), preventing suicide (LaFromboise & Lewis, 2008; Laghaei et al., 2023), improving the academic performance of teenage students (Sánchez-Hernando et al., 2021), and improving sports activities (Goudas, 2022). The LST has also been proven to be effective in the fields of sports psychology (Pierce et al., 2017), education (Prajapati et al., 2017), entrepreneurship (Jones & Iredale, 2006), employability (Ibarraran et al., 2014), job retention (Tabvuma et al., 2015) and many other fields.

Reviewing the extant literature, there is no doubt that the LST should be a part of the general course of formal education (Zollinger et al., 2003). Additionally, econometric, and psychological studies in developed countries show that non-cognitive skills (i.e., communicative, interpersonal, social, and motivational skills) can have an impact on education and the labor market in developed countries (Initiative, 2013). The LST can fill the gap between the potential and actual condition, strengthen people's ability to meet the demands of the current society and help them deal with various issues ahead (Sharma, 2022). The teaching of life skills through the curricula amounts to the development of social, emotional, and thinking skills in students since such skills are important requirements for a desirable citizen who is supposed to cope well with future challenges (Prajapati et al., 2017). The United Nations Children's Fund (UNICEF), United Nations Educational, Scientific and Cultural Organization (UNESCO), and World Health Organization (WHO) have identified 10 core strategies and techniques concerning life skills: problem-solving, critical thinking, effective communication skills, decision-making, creative thinking, interpersonal relationship skills, self-awareness building skills, empathy, and coping with stress and coping with emotions (Kellerman, 2007). In formal educational systems, curriculum planning, and program development are usually under the influence of governmental regulations and policy-making (e.g., Fundamental Reform Document of Education in Iran)

(Sarlak et al., 2020), national priorities and requirements of citizen education (Zahabioun et al., 2013). The LST is usually planned in the form of lessons that are somehow related to social activities (Botvin & Griffin, 2014; Patton et al., 1997). The LST programs have several beneficial advantages on various elements of school, career, and life outcomes, despite being significant in and of themselves. As mentioned above, the LST programs, which tackle the risk and protective variables linked to risk behaviors commencement and teach skills related to building resilience and boosting social and personal competency, are effective primary prevention programs for teenage risk behaviors such as drug use (Botvin & Griffin, 2004), suicidal behavior (LaFromboise & Lewis, 2008), cognition of risk of sexual behavior (Lou et al., 2008) and HIV prevention (Yankah & Aggleton, 2008). This evidence is particularly important for policymaking because the LST programs are costly, close to one-third to one-half of the cost of a full vocational course (Ibarraran et al., 2014). More research is also needed to understand the mechanisms through which the LST can be improved (Initiative, 2013). The results of the LST and the improvement of tools to measure life skills make it even more necessary to analyze the relevant programs. As Botvin (1985) emphasizes, the LST is usually carried out at school to improve mental health, so its role and status in the school curricula are important and worthy of attention.

In Technical and Vocational Education Training (TVET), students aged 15–18 are usually exposed to some subjects on the curriculum aimed at preparing them to enter the labor market. Part of the content of this curriculum is often dedicated to the life skills (Lee, 2017). Yet the content can be taught through other means, such as holding various LST-based lectures, designing and developing a curriculum based on life skills with a practical perspective, holding discussions and meetings about creating awareness and understanding life skills, participation of teachers in life skills workshops, and organizing exhibitions on issues relating to life skills (Saravanakumar, 2020). These activities, along with the formal curriculum, can lead to the development and improvement of students' life skills. Non-technical curricula usually place emphasis on the development of individual abilities, helping students learn how to deal with life difficulties (Butterwick & Benjamin, 2006). The LST can be either general or focused on specific issues, such as regulating emotions or preventing drug use. Whatever the purpose is, the LST centers around an interdisciplinary perspective (Ellis

& Stuen, 1998), so the combination of technical and non-technical skills can positively influence the effectiveness of such programs.

Life Skill Training and Positive Youth Development: Challenges and Opportunities

The term positive youth development (PYD) refers to a development strategy that builds on a person's strengths and recognizes life skills as desirable assets that help youth become contributing members of society (Camiré & Santos, 2019). The PYD idea, which places emphasis on fostering young people's capabilities, is based on the relational developmental systems theory (Geldhof et al., 2013). A fundamental principle of the PYD approach is that favorable developmental trajectories accumulate in environments where adolescents may engage in activities that enhance their life skills, healthy and durable adult-youth relationships, and chances to take part in meaningful group activities (Damon, 2004; Lerner et al., 2009; Neely & Holt, 2011). A review of studies conducted on the LST among youth indicates several points. First, the LST is more effective for those who are somehow exposed to social harm, especially teenagers, young people, and women (Prajapati et al., 2017). Second, a set of social and emotional skills, as well as cognitive abilities, such as critical thinking, are important for successful training. Third, the method of the LST is of the utmost importance as well. Fourth, the LST not only empowers teenagers in the face of issues and problems but also improves their mental resilience and emotional characteristics (Schram & Morash, 2002).

Furthermore, the LST can be difficult due to the need to make extensive changes, the difficulty of measuring its effectiveness, and unpredictable challenges (Schmidt, 2022). Therefore, in some cases, adolescent problems may escalate into a national issue for countries (Yankah & Aggleton, 2008). The dearth of the LST in formal education and school settings has been reported to have a detrimental impact on the majority of societal institutions (Coley & Dwivedi, 2004). WHO's analysis shows that social life skill education has relatively improved in the last three decades, yet it is still considered to be one of the challenges for formal and informal educational systems (Bharath & Kumar, 2008). Nasheeda et al. (2019) showed that the LST programs in developed countries are regular and in line with extensive, long-term plans

and have meticulous evaluation mechanisms. In less developed countries, however, the LST programs are irregular and mainly based on short-term goals, often lacking an evaluation system. The experience of youth training programs shows that life skills, as an important complement to increase the effectiveness of vocational skills, have a direct impact on non-cognitive, behavioral, and occupational outcomes (Initiative, 2013).

Educational System and Prior Research on Life Skills Training in Iran

There are two educational levels in Iran's public educational system: elementary and secondary. Each level is divided into two sub-levels, each of which is made up of three school years. Lower secondary (middle school) and upper secondary (high school) are sub-levels of the secondary level. For their final three years of high school, students in the public education system may choose to enroll in either the TVET or Theoretical majors (Figure 8.1).

The curricula deal with life skills at both elementary and secondary levels. Concerning the TVET, a series of courses, namely "non-technical competencies," are offered (Naveedy et al., 2018) – in addition to the set of skills and technical courses that encompass some elements of the LST, which are necessary for the LST (Downing, 2001). The LST is essential for graduates of the public educational system. It thus becomes necessary to incorporate the LST into the official curricula in TVET in order to fulfill the civic and citizenship education (Kennedy, 2012) and improve professional qualifications.

The courses on non-technical competencies in Iran's TVET include 1) Work Environment Requirements (10th grade), 2) Production Management (11th grade), 3) Application of Modern Technologies (11th grade), 4) Innovation and Entrepreneurship Workshop (11th grade), and 5) Professional Ethics (12th grade) – which is a total of three hours out of 40 hours of weekly training at the three-year TVET (see Figure 8.2). These courses, following a competency-based approach and offered in the form of modules, cover human, moral, social, cultural, and axiological skills with a special focus on the life skills (Nasir et al., 2011), which direct the career path and professional future of students (Ghahari et al., 2020). The multidimensional issue of life skills has been examined by several studies, including the effect of the LST on the mental health of secondary-level students (Irannezhad, 2017), the comparison of the LST in Iran's and India's curricula (Ghasemian &

Kumar, 2015), improvement of self-confidence among secondary-school students (Morowatisharifabad et al., 2019), and the effectiveness of the LST on improving students' learning (Kazemi et al., 2014; Vernosfaderani, 2013).

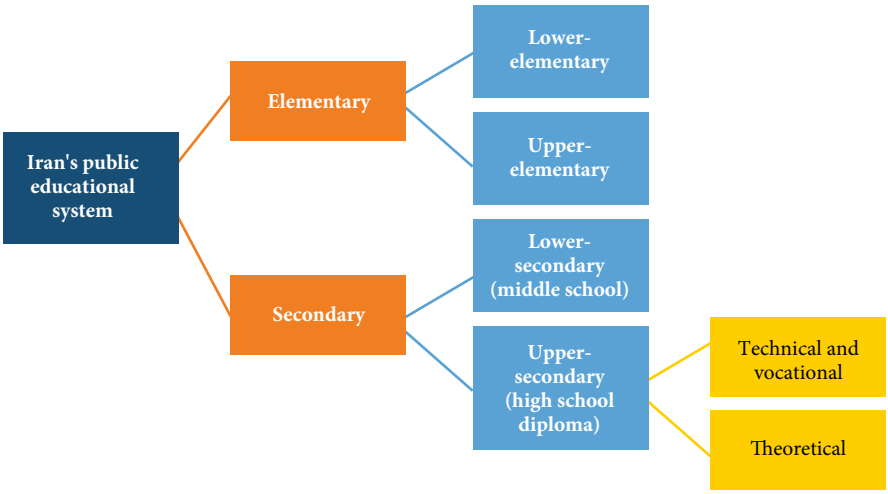

Figure 8.1 *The Structure of Iran's Public Educational System.*

Given the necessity of the LST in the official curricula, this research seeks to answer the following question: What is the extent of integration of the 10 core life skills proposed by WHO in the TVET textbooks of Iran, and how does this differ in relation to the three competency dimensions of knowledge, skill, and attitude?

Method

It is suggested that multi-method research can be used to study phenomena in order to have comprehensive and more convincing results than single method (Chamberlain et al., 2011; Davis et al., 2011; Johnson et al., 2007). As multi-method research uses both quantitative and qualitative approaches, the current study uses a qualitative research method – documentary analysis – to extract the contents, the Delphi method to prioritize them, and quantitative

content analysis through Shannon's entropy method (Knappertsbusch et al., 2021). Therefore, in terms of theoretical framework, data acquisition, data analysis, and result interpretation, this study utilizes a multi-method qualitative approach. Notably, it is preferable to point out that some scientists have categorized the application of Shannon's entropy in the content analysis as a quantitative method (e.g., Brochet et al., 2022). With quantitative content analysis, specific elements of textual, visual, or auditory content are methodically classified and documented in order to be analyzed. To successfully complete a content analysis, one must pay close attention to unitizing (i.e., segmenting the texts for analysis), sampling (i.e., choosing an appropriate group of units to investigate), reliability (i.e., having investigators make codes reliably), and validity (i.e., utilizing a coding scheme that properly represents the specified phenomena) (Coe & Scacco, 2017).

Procedure

Qualitative Step: Documentary Analysis and the Delphi Method

In selecting the methodological roadmap to establish a framework for the current study, the following steps were followed, given the nature of the research question. First, the documentary analysis paradigm of the empirical literature was used to review and categorize definitions and theories related to LST (Rapley, 2018). Next, the following life skills frameworks were investigated, drawing on global research, to provide a solid theoretical basis: Collaborative for Academic, Social, and Emotional Learning (CASEL, 2020), National Educational Technology Standards (NESTE; International Society for Technology in Education, 2007), The Partnership for 21st Century Skills (Bellanca, 2010; Larson & Miller, 2011), Definition and Selection of Competencies (DeSeCo; Rychen & Salganik, 2002), Assessment and Teaching of 21st Century Skills (ATC21s; Care et al., 2012; DiCerbo, 2014; Griffin & Care, 2014), Measuring What Matters (Schmoker, 2009), New Pedagogies for Deep Learning (Fullan & Langworthy, 2013, 2014; Macpherson, 2017), Education Research Institutes Network in the Asia-Pacific (UNESCO Bangkok, Asia and Pacific Regional Bureau for Education, 2015), and WHO's 10 core life skills. Afterward, these frameworks were presented to a group of experts consisting of two authors of non-technical competencies textbooks for TVET, two teachers of these textbooks, and two experts in LST, who also participated

in the Delphi panel and theme counting sections. Upon agreement among the experts, the WHO framework was selected as the guiding framework for analysis due to its comprehensiveness and wide application in various studies. Therefore, it was chosen for content analysis based on the levels of competency specified in the definition: knowledge, skill, and attitude. According to Parry (1996), "A competency is a cluster of related knowledge, skill, attitude (K, S, A) that affects a major part of one's job (a role or responsibility), that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved through training and development."

The fourth step involved the extraction of themes to determine the degree of attention given to life skills in TVET. Competency textbooks of TVET (Figure 8.1) were examined to assess the emphasis placed on the 10 WHO life skills components in terms of knowledge, skill, and attitude. Researcher-made checklists, in the form of information extraction sheets, were used to identify and record 10 to 12 themes for each skill. In the fifth step, five selected non-technical competencies textbooks for TVET in the 2021–2022 educational year were chosen for analysis. The titles of these textbooks, printed at the national level within Iran's formal educational system for TVET students, are as follows: Work Environment Requirements, Innovation and Entrepreneurship Workshop, Application of Modern Technologies, Production Management, and Professional Ethics. The analysis of themes related to knowledge, attitude, and skills was conducted on all five textbooks, which collectively spanned a significant 680 pages. The unit of analysis was a textbook page, which includes text, questions, exercises, activities, and assignments (For more details, see the online versions of the textbooks available at www.chap.sch.ir). Therefore, using the Delphi approach, experts (Table 8.1) prioritized the extracted themes (Sillars & Hallowell, 2012).

Given the limitations of available choices, we aimed to provide a thorough selection of relevant textbooks. We established precise inclusion criteria based on the applicability and conformity of the textbooks with our research methodology to ensure a relevant representation. Our goal was to compile a representative sample that accurately reflects how life skills have been incorporated into the curriculum. However, our sample size was constrained by limited availability. Nevertheless, we believe that the included textbooks offer valuable information and an authentic depiction of the TVET landscape.

The final step involved counting the themes. For this task, the experts were divided into two groups of three people each, with each group consisting of an author of non-technical competencies textbooks for TVET, a teacher of these books, and an expert in LST. They independently counted the themes in the task they conducted simultaneously (Oleinik et al., 2014). Scott's π was used as a measure of inter-coder reliability, which adjusts the percentage of agreement based on the number of code categories and their frequency of use. It assumes that the observed patterns of code assignment reflect the "true" distribution of categories and those competent coders identify all units corresponding to a particular category. The formula can be utilized to more than two coders by calculating π for each pair and summing them. The obtained correlation coefficient among the counted frequencies was 0.83. The text analysis unit consisted of assignments, tables, and photographs, and data extraction was conducted using a census.

To address our finite (secondary) research aim, "How can we improve the implementation of life skills in non-technical competencies textbooks for TVET in Iran?" we employed the Delphi Method, which involves a series of steps to gather expert opinions and reach a consensus (Jamali et al., 2014). In the first step, we identified a panel of experts in the field of TVET and life skills education in Iran. We reached out to experts through professional networks and universities, inviting them to participate in the study. The second step involved developing a questionnaire based on the 10 basic life skills recommended by the WHO and relevant literature on life skills education in TVET. The questionnaire aimed to elicit the experts' opinions on the current implementation of life skills in non-technical competencies textbooks for TVET in Iran, as well as potential strategies for improvement. In the third step, we administered the questionnaire to the panel of experts and collected their responses. The responses were analyzed using descriptive statistics to identify areas of consensus and disagreement. In the fourth step, we provided the experts with feedback on their individual responses and the overall group responses. We asked them to reconsider their initial responses in light of the group's feedback and provide revised responses.

Delphi Method

Originally, the term "Delphi" was used to describe a research method created by the Rand Corporation in the 1950s (e.g., Dalkey & Helmer, 1963).

According to Rausch (1979), the classical Delphi is a platform for gathering facts. In classical Delphi research, a sizable panel of objective experts (the panel) utilizes data to reach an agreement in their assessments or predictions of future occurrences. The method often involves iterative feedback and ensures panelists' anonymity (Duffield, 1988). Feedback can take the form of quantitative group responses, such as measures of variance and central tendency, or it may include individual panelist comments. The terms "true" agreement and majority rules are used to define consensus in Delphi surveys. After establishing consensus on the subject matter, further discussion focuses on the conceptualization of the study (Williams & Webb, 1994).

The Delphi method is a distinct form of qualitative research that aims to achieve agreement or convergence of views from a group of professionals. This approach differs from other qualitative methods, such as focus groups or interviews, as it does not involve direct face-to-face communication between participants and moderators. Instead, the Delphi method employs a series of surveys or questionnaires that participants complete, providing anonymous feedback and evaluations on a specific subject or issue. Experts prefer the Delphi method over other research techniques because it enables the collection of expert opinions from a wide range of perspectives. The use of anonymity in the Delphi method also helps to prevent the influence of dominant or authoritative members from swaying the group's opinion. Moreover, the Delphi method offers a well-structured process for achieving agreement, which is particularly valuable in fields where expert opinions play a critical role in decision-making, such as healthcare and policymaking.

In summary, the Delphi method is a unique qualitative research technique that involves a panel of experts providing anonymous feedback and ratings on a specific topic to achieve consensus or convergence of opinions. It is preferred over other methods due to its ability to gather opinions from a geographically dispersed panel and provide a structured process for reaching a consensus.

Quantitative Step: Shannon's Entropy

In content analysis, there are several methods for data analysis based on the percentage frequency of categories. To process the data, the present research employed Shannon's entropy method (Ellerman, 2013). One hundred and nine age-appropriate themes that were more verbally and semantically

connected to the pupils' cognitive capacity were selected. After determining the unit of analysis (pages: text, questions, pictures, and assignments) and extracting the data (through counting), the study used Shannon's entropy method to process the data in Excel 2019 software. At this stage, a content analysis table was developed, with textbooks listed in the first column and ten life skills tabulated in the second to eleventh columns. The second row in each table contains the themes related to each skill, which were prioritized at the end of the Delphi panel steps. Entropy is a concept that has been widely used as an information index in various fields of study. According to Shannon's theory of information, entropy measures the amount of uncertainty or randomness in a system. In the context of information theory, entropy is used to quantify the amount of information contained in a message or signal. The higher the entropy, the more uncertain and unpredictable the message is. Entropy has also been applied in statistical mechanics to describe the disorder or randomness of a physical system. In this context, entropy is used as a measure of the number of possible arrangements or configurations that a system can take on. So, entropy serves as an important tool for understanding and quantifying information and disorder in various systems.

Shannon's entropy formula is a fundamental concept in information theory that measures the amount of uncertainty or randomness in a discrete stochastic system. The formula was introduced by Claude Shannon in his seminal paper "A Mathematical Theory of Communication" (Shannon, 1948). The formula is expressed as , where is the entropy of the system, is the probability of occurrence of each possible outcome , and is the base -2 logarithm.

The entropy formula has numerous applications in various fields, such as cryptography, data compression, and machine learning. In cryptography, it is used to measure the strength of encryption algorithms and to design secure communication protocols. In data compression, it is used to minimize the amount of information needed to represent a message or signal. In machine learning, it is used to evaluate the quality of probabilistic models and to estimate the amount of information gained from observing data.

Several books and papers have been written on Shannon's entropy formula and its applications. One notable book is "Elements of Information Theory" (Cover & Thomas, 2006), which provides a comprehensive introduction to information theory and its applications. In conclusion, Shannon's entropy

formula is a powerful tool for measuring uncertainty and randomness in discrete stochastic systems. Understanding this concept can lead to significant advancements in these areas and beyond.

In other words, the entropy of the S (random variable or a set of outcomes) is equal to:

$$H(S) = \sum_{i=1}^{n} P_i \log_{\left(\frac{1}{P_i}\right)} = -\sum_{i=1}^{n} P_i \log\left(P_i\right)$$

Entropy for random variable (X) can also be defined using the specified probability as follows:

$$H(X) = -k\int x dF(x)$$

Note that in the discrete state, the integral is the same as the sum.

The following are some reasons why Shannon's entropy measure can be used as an information index weight in ranking methods:

1. It provides a quantitative measure of the amount of uncertainty or randomness in a set of data. This makes it useful for ranking methods that require the identification of important or relevant information from a large pool of data (Cover & Thomas, 2012).
2. It is based on the concept of probability, which allows for the calculation of the likelihood of an event occurring. This makes it useful for ranking methods that involve probabilistic models or algorithms (Manning et al., 2008).
3. It is easy to compute and interpret, making it accessible to researchers and practitioners who may not have extensive knowledge of advanced mathematical concepts (Shannon & Weaver, 1949).
4. It has been shown to be effective in various applications such as text classification (Yang & Pedersen, 1997), web page ranking (Brin & Page, 1998), and image retrieval (Swain & Ballard, 1991).

In conclusion, Shannon's entropy measure can be used as an information index weight in ranking methods due to its ability to quantify uncertainty and probability while being easy to compute and interpret.

Results

Delphi Panel

Table 8.1 shows the experts on the Delphi panel and their characteristics.

Table 8.1 *The Participants on the Delphi Panel and their Characteristics*

No.	Professional Title	Number	Service Location	Degree and Work Experience
1	Curriculum planning expert	1	Organization for Educational Research and Planning	M.A. More than 15 years
2	Professor of educational sciences	1	Allameh Tabatabaei University	Ph.D. More than 15 years
3	LST expert	1	Ministry of Science, Research and Technology/Ministry of Health and Medical Education/ State Welfare Organization of Iran	Ph.D. More than 15 years
4	Teacher of courses on non-technical competencies at TVET	3	Directorate of Education of Tehran Province	M.A. Teaching experience at TVET

Note. M.A.=Master of Art, Ph.D.= Doctor of Philosophy, TVET= Technical and Vocational Education Training

Figure 8.1 is already cited in several places; cited first time on page 191.

After theme extraction and categorization according to the theoretical and empirical literature, eight themes were prioritized on the first round of the Delphi panel, which were later reduced to five themes on the second panel. On the third panel, at least three themes were finally agreed upon for each skill. In other words, the three rounds of the Delphi panel, which is recommended by other studies such as Hallowell and Gambatese, (2010) and Jamali et al., (2014), resulted in the identification of three to five main themes regarding each of the 10 skills at each level (i.e., knowledge, skill, and attitude) (see Tables 2, 3, and 4). The steps taken in the Delphi process are summarized in Figure 8.2 (Jamali et al., 2014).

Table 8.2 *Content Analysis of Life Skills Themes at the Level of Knowledge*

Criteria Textbooks	Self-Awareness	Critical Thinking	Creative Thinking	Decision-Making	Problem-Solving	Effective Communication	Interpersonal Relationship Skills	Empathy	Coping with Stress	Coping with Emotions
Themes (the level of knowledge)	Naming personal weaknesses and strengths, understanding the need for personal improvement, expressing self-control skills, recognizing tolerance thresholds, and identifying individual preferences	Defining critical thinking, stating the role of critical thinking in continuous improvement of performance, naming the benefits of using critical thinking, and describing similar effective work experiences	Connecting old and new phenomena, describing governing patterns and relationships, and identifying new processes and methods	Explaining the process of individual decision-making, defining basic principles and methods for decision-making, understating goals and limitations, and understanding information	Defining the problems ahead; identifying problems, contradictions, complaints, and shortcomings; and identifying possible solutions	Explaining the rules and principles of negotiation, expressing conflicts, describing concerns and complaints, and identifying environmental requirements	Explaining the themes of group dynamics, describing hierarchies in human systems, and describing an effective negotiation	Explaining the necessity of voluntary and enthusiastic help to others. Expressing the importance of creating a friendly relationship with others, workers, and customers; and identifying others' emotional state	Identifying individual and environmental stressful factors and situations, identifying individual responsibilities and duties, reducing expectations, identifying rules and regulations, and expressing stress-reducing solutions	Naming the strategies to control emotions and identifying external and internal causes of emotions
Work Environment Requirements	2	4	8	12	4	3	7	3	2	2
	20%	9%	17%	21%	7%	8%	22%	16%	20%	6%
Innovation and Entrepreneurship Workshop	4	15	15	20	20	15	15	4	4	1
	40%	33%	31%	35%	33%	39%	47%	21%	40%	3%
Production Management	2	6	1	5	5	6	5	2	1	5
	20%	13%	2%	9%	8%	16%	16%	11%	10%	16%
Application of Modern Technologies	1	15	20	5	11	4	4	2	1	1
	10%	33%	42%	9%	18%	11%	13%	11%	10%	3%
Professional Ethics	1	5	4	15	20	10	1	8	2	22
	10%	11%	8%	26%	33%	26%	3%	42%	20%	71%
Total	**10** **2.8%**	**45** **12.6%**	**48** **13.5%**	**57** **16%**	**60** **16.9%**	**38** **10.7%**	**32** **9%**	**19** **5%**	**10** **2.8%**	**31** **8.7%**

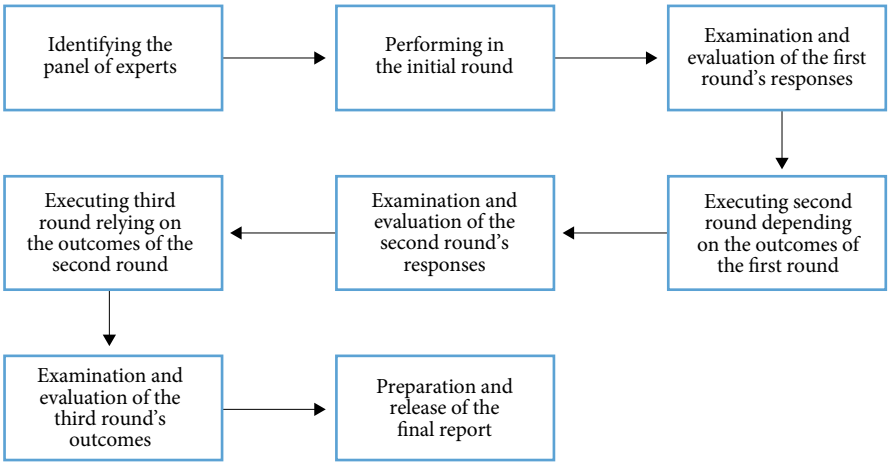

Figure 8.2 *Steps of the Delphi Method*

As depicted in Table 8.2, the examination of the themes at the level of knowledge revealed that out of a total of 355 frequencies, the problem-solving skills have the highest frequency (60 instances, 16.9%) and the lowest frequency (i.e., 10 instances, 2.8%) is observed equally for coping with stress and self-awareness. The frequency of the rest of the skills was as follows: critical thinking (45 instances, 12.6%), creative thinking (48 instances, 13.5%), decision-making (57 instances, 16%), effective communication (38 instances, 10.7%), interpersonal relationship skills (32 instances, 9%), empathy (19 instances, 5%), and coping with emotions (31 instances, 8.7%).

Regarding skill level, the content analysis of non-technical competencies textbooks identified life skills themes and their corresponding frequencies, which are presented in Table 8.3.

As evident in Table 8.3, the examination of the themes at the level of skill revealed that out of a total of 237 frequencies, problem-solving, and decision-making have the highest frequency, with 41 instances (17.3%) and 37 instances (15.6%), respectively. The lowest frequency (i.e., 8 instances, 3%) is observed in coping with stress. Self-awareness (11 instances, 4.6%) and interpersonal relationship skills (15 instances, 6.3%) also received lower ranks. The frequencies of other skills are as follows: critical thinking (31 instances, 13%), creative thinking (25 instances, 10.5%), effective communication (30 instances, 12.6%), empathy (21 instances, 8.8%), and coping with emotions (18 instances, 11.8%).

Table 8.3 *Content Analysis of Life Skills Themes at the Level of Skill.*

Criteria Textbooks	Self-awareness	Critical thinking	Creative thinking	Decision-making	Problem solving	Effective communication	Interpersonal relationship skills	Empathy	Coping with stress	Coping with emotions
Themes (the level of skill)	Analyzing individual actions and reactions, criticizing a set of ethical behaviors and decisions in the workplace, and comparing ethical and functional behaviors	Analyzing different situations, problems, and experiences; sympathizing with people; and predicting situations based on reasoning	Generating creative solutions, applying creative solutions to new situations, and combining solutions with the aim of improving efficiency	Analyzing situations and information, predicting risks, prioritizing goals, and gathering different viewpoints	Analyzing data, analyzing reasons and possible causes, planning operations, and comparing the probability of success of different solutions	Modifying behavior in accordance with environmental requirements, empathizing with others, and gaining awareness of non-verbal communication	Promoting group dynamics, describing hierarchies in human systems, and describing an effective negotiation	Interpreting communication and conversations, identifying verbal communication, and using effective verbal communication	Avoiding stressful situations, positively confronting the stressful phenomenon, and reasoning for making decisions in adverse situations	Controlling emotions, making decisions and taking right measures in the face of emotions, and properly implementing steps to control emotions
Work Environment Requirements	2	2	4	4	5	2	1	4	1	4
	18%	6%	16%	11%	12%	7%	7%	19%	13%	22%
Innovation and Entrepreneurship Workshop	3	11	8	14	20	10	6	6	2	6
	27%	35%	32%	38%	49%	33%	40%	29%	25%	33%
Production Management	1	2	1	5	5	6	5	5	1	2
	9%	6%	4%	14%	12%	20%	33%	24%	13%	11%
Application of Modern Technologies	2	12	10	5	5	2	2	2	1	1
	18%	39%	40%	14%	12%	7%	13%	10%	13%	6%
Professional Ethics	3	4	2	9	6	10	1	4	3	5
	27%	13%	8%	24%	15%	33%	7%	19%	38%	28%
Total	**11**	**31**	**25**	**37**	**41**	**30**	**15**	**21**	**8**	**18**
	4.6%	**13%**	**10.5%**	**15.6%**	**17.29%**	**12.6%**	**6.3%**	**8.8%**	**3%**	**11.8%**

Table 8.4 *Content Analysis of Life Skills Themes at the Level of Attitude.*

Criteria Textbooks	Self-Awareness	Critical Thinking	Creative Thinking	Decision-Making	Problem Solving	Effective Communication	Interpersonal Relationship Skills	Empathy	Coping With Stress	Coping With Emotions
Themes (the level of attitude)	Dealing responsibly with activities, judging decision-making and performance behaviors, showing care and social responsibilities, and convincing people to act according to professional ethics	Evaluating and judging others' critical thinking skills, inferring new patterns in critical thinking methods, and provoking questions and creating new perspectives in others	Applying and creating appropriate technologies to improve processes and results, creating new and creative applications for technologies along with observing the ethics of technology, and changing a disadvantageous situation into a useful one	Evaluating multiple solutions, predicting outputs and results based on previous experiences and knowledge, judging goals and results, distinguishing useful and non-useful activities, and categorizing goals	Evaluating solutions, evaluating operational plans, judging the effectiveness and efficiency of solutions, and generating righteous solutions	Evaluating Basic issues, evaluating the consequences of negotiation, distinguishing between facts and inferences, valuing different opinions, and believing in and being committed to social development	Living within the framework of civil laws and principles; managing the conflict between rights and interests; using non-verbal communication appropriately; using mathematical symbols, techniques, and formulas to gain inspiration to convey concepts; convincing people to reject unhelpful proposals; and gaining trust	Creating individual goals and ideals and adhering to them, creating new values for oneself and the group, exercising active activism in realms of life, performing voluntary activities along with understanding individual and collective interests, and possessing the ability to postpone individual interests for the sake of group interests	Creating an effective action with conflicting positions in individual and group dimensions, managing one's fear and hope and that of others, evaluating and predicting stressful situations for oneself and others	Believing in preventing tensions and crises, correctly predicting the consequences of actions, being patient until reaching the desired result, and convincing others to be patient
Work Environment Requirements	2	5	3	2	1	1	1	1	4	1
	25%	24%	15%	20%	6%	9%	7%	13%	50%	17%
Innovation and Entrepreneurship Workshop	2	9	5	6	9	4	7	3	1	6
	25%	43%	25%	40%	53%	36%	50%	38%	13%	17%
Production Management	2	1	1	1	1	2	1	1	1	1
	25%	5%	5%	10%	6%	18%	7%	13%	13%	17%
Application of Modern Technologies	1	4	7	1	2	1	4	2	1	2
	13%	19%	35%	10%	12%	9%	29%	25%	13%	33%
Professional Ethics	1	2	4	2	4	3	1	1	1	1
	13%	10%	20%	20%	24%	27%	7%	13%	13%	17%
Total	**8** **6%**	**21** **16.1%**	**20** **15.4%**	**12** **9.2%**	**17** **13%**	**11** **8.5%**	**14** **11%**	**8** **6%**	**8** **6%**	**11** **8.4%**

Considering attitude level, the content analysis of non-technical competencies textbooks led to the identification of life skills themes and their frequencies of occurrence (see Table 8.4).

As shown in Table 8.4, the examination of the themes at the level of attitude showed 130 frequencies, which is lower than the total frequency at the levels of knowledge (355) and skill (237). Concerning the level of attitude, critical thinking (21 instances, 16.1%) and creative thinking (20 instances, 15.4%) have the highest frequency, and the lowest frequency is observed in coping with stress, empathy, and self-awareness, with a frequency of 8 (6%). The frequencies of other life skills at the level of attitude are as follows: coping with emotions (11 instances, 8.4%), decision-making (12 instances, 9.2%), problem-solving (17 instances, 13%), effective communication (11 instances, 8.5%), and interpersonal relationship skills (14 instances, 11%). Moreover, the results showed that life skills do not have a normal distribution. For example, the total frequency of the themes about coping with stress, self-awareness, and empathy is equal to 103, and the total frequency of the themes related to problem-solving, decision-making, and critical thinking is 319.

In Table 8.5, we utilized Shannon's entropy method to convert the frequency data of the 10 skills in the textbooks into two key measures: the importance coefficient (Ej) and the information index (Wj). This transformation enables us to make more informed assessments regarding the level of attention given to these skills in relation to the three themes. By examining the table, we observe that while there is a linear correlation between the importance coefficients and the information indexes, there is no direct association between the frequencies and these two measures. Consequently, it is important to highlight that the frequency of skills in textbooks does not accurately reflect the extent of attention they receive. The information index serves as a better indicator of attention and is not linearly dependent on the frequency.

The present research aimed to answer the following research question: To what degree do the TVET textbooks in Iran incorporate the 10 essential life skills recommended by WHO, and how do the levels of attention vary among the dimensions of knowledge, skill, and attitude? To answer the research question, the study analyzed the components of the LST in the non-technical competencies textbooks for the technical and vocational branch of the upper secondary level (high school) in Iran. The extracted themes from the content analysis of life skills at the levels of knowledge, skill, and attitude are presented in Table 8.6. In accordance with Shannon's method, a category with a larger information index betokens a greater degree of importance (Wj). A normalized weighted ranking of knowledge, skill, and attitude is provided in Table 8.6 by Shannon's entropy for each of the life skills.

Table 8.5 *The Distribution of Frequency of Life Skills Themes at the Levels of Knowledge, Skill, and Attitude.*

	Self-awareness	Critical thinking	Creative thinking	Decision-making	Problem solving	Effective communication	Interpersonal relationships skills	Empathy	Coping with stress	Coping with emotions
Knowledge	**10**	**45**	**48**	**57**	**60**	**38**	**32**	**19**	**10**	**31**
E_j	.91	.91	.82	.91	.89	.90	.84	.91	.91	.58
W_j	.11	.11	.09	.11	.10	.10	.10	.11	.11	.07
Skill	**11**	**31**	**25**	**37**	**41**	**30**	**15**	**21**	**8**	**18**
E_j	.96	.84	.84	.93	.87	.88	.89	.82	.52	.80
W_j	.11	.10	.10	.11	.10	.11	.11	.10	.06	.10
Attitude	**8**	**21**	**20**	**10**	**17**	**11**	**14**	**8**	**8**	**6**
E_j	.97	.86	.91	.91	.78	.91	.79	.93	.86	.97
W_j	.11	.09	.10	.10	.09	.10	.09	.10	.10	.11

Note. E_i = entropy, W_i= weighted index

Table 8.6 *Comparison of Frequency Rankings, Entropy (Information Index), and Normalized Weight (Importance Coefficient) of Each Skill at Different Levels.*

		Self-Awareness	Critical Thinking	Creative Thinking	Decision-Making	Problem Solving	Effective Communication	Interpersonal Relationship skills	Empathy	Coping with Stress	Coping with Emotions
Knowledge	Frequency	10	45	48	57	60	38	32	19	10	31
	Frequency rank	9	4	3	2	1	5	6	8	9	7
	Entropy and normalized weighted rank (information index and importance coefficient)	2	4	9	1	7	6	8	5	2	10
Skill	Frequency	11	31	25	37	41	30	15	21	8	18
	Frequency rank	9	3	5	2	1	4	8	6	10	7
	Entropy and normalized weight ed rank (information index and importance coefficient)	1	7	6	2	5	4	3	8	10	9
Attitude	Frequency	8	21	20	10	17	11	14	8	8	6
	Frequency rank	7	1	2	6	3	5	4	7	7	10
	Entropy and normalized weighted rank (information index and importance coefficient)	2	7	5	4	10	6	9	3	8	1

Discussion

In the last two decades, the LST has found its way into the curriculum and become a sine qua non of formal educational systems and programs (Gim, 2021). Empirical evidence shows that the LST is of utmost importance in a secondary school as it coincides with the teenage years (Wurdinger & Rudolph, 2009), and it can help students pass this stage of life with fewer crises (Botvin & Griffin, 2004). Accordingly, formal and informal educational systems have tried to teach students the required life skills, in addition to various subjects, through the school curriculum (Bouck, 2010; Chiang et al., 2017; Fagan & Mihalic, 2003; Visser, 2005). The purpose of the current study was to analyze the content and gauge how much emphasis is placed on the 10 fundamental life skills suggested by WHO in the TVET curriculum of Iran and how much this varies in terms of knowledge, skill, and attitude. Five textbooks taught in the 9th, 10th, and 11th grades were analyzed in terms of their content to determine the degree of attention paid to life skills. The 10 basic life skills outlined by WHO served as the foundation for the content analysis's topics. First, the themes were categorized by documentary method, and then the Delphi method was used to extract and prioritize the themes relating to each skill. Third, the content of the books was classified into three levels, including knowledge, skill, and attitude, with an eye on the themes relating to each skill. Finally, the degree of attention paid to each skill was counted by experts and analyzed through the entropy method.

The content analysis results showed that all five textbooks analyzed contain the themes about life skills manifested, in one way or another, at three levels of knowledge, skill, and attitude. The knowledge level has the highest frequency of life skill themes compared to the other two levels. This finding is consistent with the knowledge-oriented curriculum approach in which the educational contents are subject-based and aim to teach students specific knowledge (Krauss & Suandi, 2008; Sundby & Karseth, 2022). In Iran, the dominant approach is *curriculum as content* (Sattari, 2010), which is a traditional attitude in curricula design and development (Coşkun & Aslan, 2021). It is like placing the wagon before the horse in the curriculum as content approach. The emphasis is on what to teach, with little attention given to why we are teaching it or the fact that knowledge is the objective, and disciplines are only different paths to get there. It is like planning a road trip without a specific goal in mind—you could cover a lot of land, but where are you actually going?

(Priestly et al., 2021). Therefore, it is expected that curriculum designers and book authors devote special attention to the transfer of subjective knowledge through the textbooks because, at the level of knowledge, the course materials and subjects are more concrete, understandable, measurable, and compatible with the structure of textbooks. It is thus more likely that planners and authors direct special attention to the level of knowledge, which is called a knowledge-rich curriculum (Sherrington, 2018). Therefore, it is expected that more attention will be given to the level of knowledge. It is also important to note that Bloom's classification of knowledge levels (Armstrong, 2016) has been studied and applied more in the curricula design; it is more useful in the development of textbooks as its indicators are more accurate than the levels of skill and attitude (Olimat, 2015; Zorluoglu & Kizilaslan, 2019). Bloom and colleagues presented their system for classifying educational goals in 1956 under the brand Bloom's Taxonomy (Krathwohl, 2002). The taxonomy is divided into six main categories: knowledge, comprehension, application, analysis, synthesis, and evaluation. These categories range from simple to complicated and from concrete to abstract. The framework is typically known by its six basic categories, although each category also contains subclasses. A team of cognitive psychologists, curricular theorists, educational investigators, and experts in testing and assessment modified Bloom's Taxonomy in 2001 in a form that was more dynamic and goal-oriented (Forehand, 2005). The updated taxonomy describes the cognitive processes by which intellectuals come into contact and interact with knowledge by labeling categories and subcategories with verbs and gerunds. The use of Bloom's Taxonomy in education has a number of advantages. It provides learning objectives and goals, which aid in clarifying goals for teachers and students alike. Teachers can better prepare and provide efficient education, create reliable evaluation assignments and techniques, and make sure that instruction and assessment are in line with the objectives by using organized objectives.

According to a thorough examination of non-technical competencies textbook content, Iran's proposed curriculum appears to place the most significant attention on problem-solving, decision-making, and creative thinking. Yet decision-making, self-awareness, and coping with stress have the highest importance coefficient. In this sense, determining the degree of attention given to life skills at the level of knowledge in Iranian textbooks requires the

consideration of instances of decision-making, self-awareness, and coping with stress, as presented in the textbooks.

At the level of attitude, problem-solving, decision-making, and critical thinking are the most frequent skills, thus getting the most attention. However, self-awareness, decision-making, and interpersonal relationship skills have the highest importance coefficient. If we consider attitude as having three dimensions (actions, beliefs, and feelings; Pickens, 2005), life skills should strengthen these three dimensions in students. In this sense, determining the degree of attention given to life skills at the level of attitude in Iranian textbooks requires the consideration of instances of self-awareness, decision-making, and interpersonal relationship skills as presented in the textbooks.

Critical thinking, creative thinking, and problem-solving are the most frequent at the level of skill, thus getting the most attention. However, coping with emotions, self-awareness, and empathy are the skills with the highest importance coefficient per se. Thus, determining the degree of attention given to life skills at the level of skill in Iranian textbooks requires the consideration of instances of coping with emotions, self-awareness, and empathy, as presented in the textbooks.

Moreover, the lowest frequency at the level of knowledge is observed in coping with stress, self-awareness, and empathy. At the skill level, coping with stress, self-awareness, and interpersonal relationship skills have the lowest frequency. At the level of attitude, coping with emotions, coping with stress, empathy, and self-awareness are the least frequent. The high frequency of problem-solving, creative thinking, critical thinking, and decision-making can be attributed to the nature of the TVET (Jabarullah & Iqbal Hussain, 2019), the dominance of the content (Syomwene, 2020), or the implicit intention of curriculum planners to develop technological skills and increase the mental abilities among the students in a developing country like Iran (Vajargah et al., 2009). For example, on page 35 of the textbook Innovation and Entrepreneurship Workshop, there is a practical activity asking students to visit the website of an official database of intellectual property registration and the database of inventions, use several keywords to search for inventions, find out the context of the idea generation in the inventor's mind, and predict the final price of the product as well as the success of the idea in the market. Combining the detailed search and examination of a situation and strengthening the student's ability to use knowledge and information interactively, this activity takes the

learner beyond the level of knowledge and guides her/him towards the level of skill and the formation of attitude concerning problem-solving.

The reason behind more emphasis put on the level of knowledge can be discussed from another perspective. In Iran, the curriculum planning system operates in a centralized manner, meaning that a uniform curriculum is developed and implemented across the entire country. Despite the very high cultural diversity in Iran (Azimi, 2021), the content of textbooks tries to promote a kind of uniformity and inculcate the idea of all under one coordinated system, of all being a single nation. This focus has led to the development of an expansive structure called the Textbook Compilation Office, which works on different levels from elementary to upper secondary.

Furthermore, the lower frequency of and less attention given to coping with emotions, coping with stress, empathy, and self-awareness can be interpreted from several perspectives. First, in the centralized system, curriculum planning, course design, material development, and even program evaluation are carried out in a centralized manner. In such a system, LST is a part of the national curriculum. The premise that students have already learned self-awareness, stress control, and emotion regulation in other subjects (Iqbal et al., 2017) can thus be a reason behind the primary focus of the technical and vocational branch on the repetition of critical thinking, creativity, problem-solving, and decision-making (Ghombavani, 2016). There are two important views. According to the first view, life skills constitute a holistic paradigm by which learning can help people live a better life (Velasco et al., 2021). The second view upholds the idea that each life skill has its own use, so it is possible to put more emphasis on particular skills in the curriculum of different courses and in line with the purpose of the educational program and course (Nyaberi, 2010). The second account touches upon the fact that the provision of a labor force is one of the tasks of the educational system in most developing countries. In this context, LST can facilitate the post-graduation employment of individuals (Ibarraran et al., 2014). Therefore, the need to prepare individuals for professional and specialized jobs itself reinforces the importance of life skills, such as decision-making, creative thinking, and subject-based thinking, in technical and vocational education and training. Although this way of thinking is supported by many, it can lead to a disregard for psychological aspects and self-awareness because the latter seem less aligned with macro-scale missions and goals.

In this study, looking at themes at the knowledge level does not indicate that skills are excluded. Instead, knowledge serves as the basis for the acquisition of sophisticated abilities. A well-known educational framework, Bloom's Taxonomy, divides educational objectives into six broad categories, with knowledge as the essential one. It is generally acknowledged that gaining information is essential for developing higher-level cognitive abilities. In order to emphasize the significance of knowledge as a prerequisite for the learning and application of skills, our study concentrated on the frequency of life skill themes at various levels. By highlighting the importance of knowledge, we highlight the importance of a curriculum that emphasizes the development of a strong knowledge basis for the acquisition of a variety of abilities. The potential emergence of culturally pertinent themes that may not be covered by existing frameworks like the World Health Organization (WHO) we used in this study should also be noted. This could be regarded as a limitation of our study since we mainly used the pre-existing categories that these frameworks offered for our analysis. It would be beneficial to investigate other themes that emerge from the texts in future studies while taking into account the cultural context and local perspectives.

Conclusions

The results of this research showed that the textbooks for TVET in Iran pay more attention to the components of the level of knowledge. It should be considered that two other levels, namely skill and attitude, play an important role in training competent people. Since focusing on skills is secondary to focusing on them in the curriculum's objectives (Piri & Sahraei, 2022), it is recommended that curriculum planners establish a balance between the components of knowledge, skill, and attitude in the development of the curriculum and content for TVET courses. It is also suggested that more instances of life skills that have an individual dimension be included in the textbooks. The present research used the WHO framework encompassing 10 core life skills. Future studies can use other relevant frameworks. Any use of the results of this research should consider the limitations inherent in the multi-method research, such as the nature of data collected, the content examined, and the opinions of experts who participated in the study. Also, as PYD places more emphasis on encouraging positive outcomes than it does

on merely lowering risk behaviors, a crucial part of PYD is life skills education, which equips young people with the knowledge and abilities they need to successfully traverse adolescence and make the transition to adulthood. Integrating life skills instruction into TVET textbooks can significantly enhance the growth of pupils. Implementing life skills education has been demonstrated to promote social competence, self-efficacy, and self-esteem while decreasing risk-taking behaviors, including drug use and unprotected sex (Botvin & Griffin, 2004; Lou et al., 2008). For students in TVET to pursue their current and future life goals, integrating PYD and life skills education can be extremely beneficial. PYD can assist students in reaching their short- and long-term goals by using a strengths-based approach and giving them the resources to overcome obstacles. Additionally, life skills instruction can assist students in developing the abilities they need to pursue their ideal career paths and successfully enter adulthood. Overall, PYD and life skills education promotion in schools can have a significant positive impact on youth success in the developmental trajectory.

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