

From the 4 Cs to the 7 Cs Framework: Digitalizing Learning by Fostering Twenty-first Century Skills

من إطار المهارات الأربع إلى إطار المهارات السبع: رقمنة التعلم من خلال تعزيز مهارات القرن الحادي والعشرين

Dr. Mounya ABDAOUI*

Received: 26/08/2025

Accepted: 22/10/2025

Published: 05/12/2025

Abstract:

As the 4 Cs framework is no longer comprehensive to address the demands of the digital age, Trilling and Fadel extended it to include seven competencies. The aim behind this research is to assess learners' 21st century skills and evaluate the comprehensiveness of the 7 Cs framework. Hence, the descriptive method was adopted by administering a structured questionnaire to 40 first-year students of English at the University of Guelma. 92.5% of the participants asserted that the most significant factor that can promote digital skills is creating a learning environment that supports the 7 Cs framework.

Keywords: 21st Century Skills; 4Cs Framework; 7Cs Framework; Digital Learner.

ملخص:

بما أن إطار المهارات الأربع لم يعد شاملا لتلبية متطلبات العصر الرقمي، قام تريلينغ وفادل بتوسيعه ليضم سبع مهارات. يهدف هذا البحث إلى تقييم مهارات القرن الواحد والعشرين للمتعلمين والتحقق من شمولية إطار المهارات السبع، ولهذا تم اعتماد المنهج

*abdaoui.mounya@univ-guelma.dz

الوصفي من خلال إجراء استبيان مغلق يشمل 40 طالبا من طلبة السنة الأولى ليسانس
الانجليزية في جامعة قالمة. وقد أكد 92.5% من المشاركين على أن العامل الأكثر أهمية في
تعزيز المهارات الرقمية هو خلق بيئة تعليمية تدعم إطار المهارات السبع.

كلمات مفتاحية: مهارات القرن الواحد والعشرون، هيكل المهارات الأربع، هيكل
المهارات السبع، متعلم رقمي.

*** **

Corresponding author: Mounya ABDAOUI, abdaoui.mounya@univ-guelma.dz

1. INTRODUCTION

Twenty-first century skills are essential for success in the globalized digital world. Learners should possess important skills like critical thinking, creativity, collaboration, and digital literacy to cope with the demands of the modern world and digital globalization. The 4Cs framework, including: critical thinking, collaboration, creativity, communication, was created by the *Partnership for 21st Century Skills Organization* (2009) in USA. It aims at integrating twenty-first century skills in learning in order to promote learners' soft skills and Lifelong Learning. In 2009, Trilling and Fadel extended the framework to 7Cs to make it more adaptable to the digital age. They added three important factors:

- Computing and ICT literacy,
- Cross-cultural understanding,
- Career and learning self-reliance.

Concerning factor 4 in the 4Cs framework, that is ‘communication’, Trilling and Fadel expanded on it by adding ‘information, and media literacy’ as essential components in the age of technology. The new skill is now labelled ‘communication, information, and media literacy’. Consequently, the aim of this research is three-fold:

1-to assess EFL learners’ 21st century skills that are stated in Trilling and Fadel’s 7Cs Framework (2009) in order to investigate whether learners possess digital skills or not.

2-to explore learners’ opinions about the comprehensiveness of the 7Cs framework.

3-to emphasize teachers’ role in helping learners enhance their 21st century skills.

Within this scope, the present research addresses the following research questions:

1-Is EFL learners’ level of twenty-first century skills high, average, or low?

2-Do EFL learners think that the 7Cs Framework is comprehensive?

3-How can teachers help learners improve their 21st century skills?

2. Twenty-first Century Skills and Digital Learning

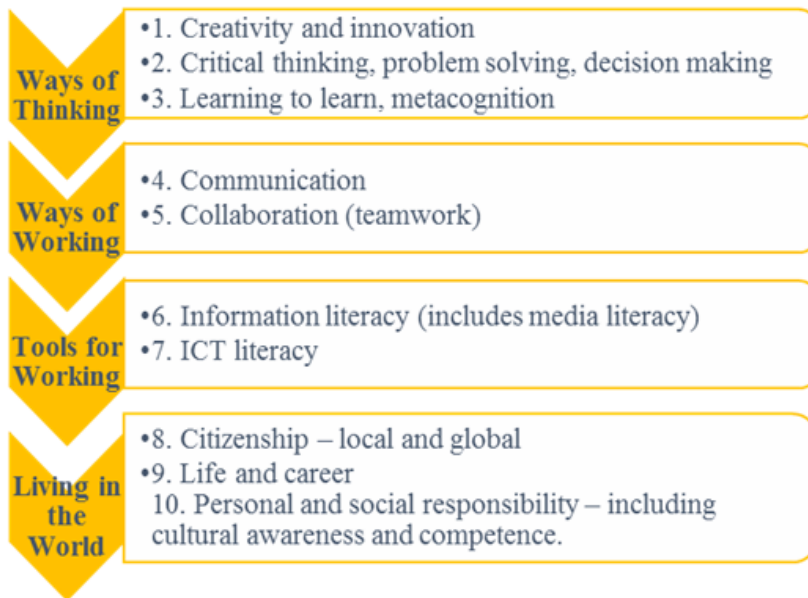
Duncan (2009) defined twenty-first century skills as “skills that increasingly demand creativity, perseverance, and problem solving combined with performing well as part of a team”. 21st century skills are defined by Chen (2023) as “any knowledge, understandings, performances, or competencies that are long-

term manifestations to make things happen” (p. 279). They are considered as ‘life competencies’ that “include the knowledge, skills and attitudes we need to participate effectively in the world around us, and to fulfill our potential – in our education, our careers and our lives in general” (*The Cambridge Framework*, 2020, p. 2). Larsen and Miller described 21st century skills as “skills for the future” that can be integrated in the classroom by ensuring authenticity (2011, p. 122). It is concluded that 21st century learning can be defined as *personalized and globalized learning that employs applied skills to achieve life goals*.

In the digital age, learners are considered as *digital learners* who are tech-literate and able to use technological devices to receive, send, and process digital information. In this respect, possessing 21st century skills goes hand in hand with being a digital learner who is ready to tackle global issues and keep in pace with the world’s challenges. Furthermore, a digital learner is able to conduct research through technology (Larsen & Miller, 2011). Therefore, s/he should be trained to master computer science and online platforms especially in low resource settings where the rate of tech-literacy is high.

Many models were designed to conceptualize learners’ twenty-first century skills. The KSAVE Model that stands for ‘**K**nowledge, **S**kills, **A**ttitudes, **V**alues, and **E**thics’ was introduced in Australia by Brinkley et al. (2012). It encompasses ten skills distributed over four categories as summarized in the following figure:

Figure 1. *The KSAVE Model*



The KSAVE model stresses the importance of critical thinking and problem-solving skills, in addition to metacognitive skills. It further accentuates the value of collaboration and the use of ICTs in education. Moreover, it draws attention to the significance of both local and global citizenship and cultural awareness. Another prominent model is *the Cambridge Life Competencies Framework (CLCF, 2020)* that stresses the importance of six twenty-first century skills: 1-Creative thinking, 2-Critical thinking, 3-Learning to learn (practical skills for participating in learning), 4-Communication, 5-Collaboration, 6-Social Responsibilities. In 2021, the framework was updated to include seven skills as follows: 1-Creativity thinking, 2-Critical Thinking, 3-Learning to learn 4-Communication, 5-Collaboration, 6-Social responsibilities, and 7-Emotional

development, and (*The Cambridge Framework*, 2021). In 2022, it was updated again to encompass eight skills as follows: 1-Creativity, 2-Critical thinking & problem-solving, 3-Digital literacy, 4-Learning to learn, 5-Communication, 6-Collaboration, 7-Emotional development, and 8-Social responsibilities (*The Cambridge Framework*, 2022). Eventually, models that describe 21st skills are available; however, models for assessing these skills remain largely absent. What complicated measurement is the nature of some skills that are subjective and unmeasurable.

Enter here the text of second subtitle, enter here the text of second subtitle, enter here the text of second subtitle, enter here the text of second subtitle, enter here the text of second subtitle, enter here the text of second subtitle.

3. Research Methodology and Design

This research was conducted through the quantitative descriptive method by administering a structured questionnaire to 40 first-year Licence students at the Department of English/University of Guelma during the academic year 2024-2025. The questionnaire aims at assessing learners' level of 21st century skills as perceived by them. It further surveys their opinions on the comprehensiveness of the 7Cs framework and teachers' roles to enhance learners' digital skills.

The questionnaire is composed of three sections including 25 closed questions. Section One (3 Questions) collected general information about EFL learners. Section Two (6 Questions) tackled learners' twenty-first century skills and their digital qualities. It further gathered learners' opinions about the comprehensiveness of the 7Cs Framework. Section Three (16

Questions) explored the seven skills related to the 7Cs Framework as well as teachers' roles in helping learners foster these skills.

4. Results

Quantitative data from the structured questionnaire was collected, analyzed, and interpreted in the light of the research aims and questions. The main results are displayed in the following tables:

Table 1. *Learners' Perceptions of the most Important Twenty-first Century Skills to Digitalize Learning*

Options	Frequency	Percentage
Critical thinking	24	60%
Collaboration	30	75%
Creativity	25	62.5%
Communication, information, and media literacy	34	85%
Computing and ICT literacy	21	52.5%
Cross-cultural understanding	30	75%
Career and learning self-reliance	32	80%
<i>Total</i>	<i>40</i>	<i>100%</i>

As displayed in Table 1, the majority of the informants (85%) opted for communication, information, and media literacy as a significant factor in digitalizing learning. This demonstrates that digitalizing learning can be achieved through recent

technological advancements. 80% of them favored career and self-reliance as the most important 21st century skill since learners who are totally dependent on the teacher cannot create an independent digital learning environment. 75% of the participants emphasized the interesting role of both online collaboration and cross-cultural understanding in digitalizing learning. Less than two-thirds of the population (62.5%) stressed the significance of creativity in digital learning. 60% of the respondents maintained that critical thinking is the most important 21st century skill. More than half the population (52.5%) indicated that computing and ICT literacy are essential components in making learning digital.

Table 2. *Comprehensiveness of the 7Cs Framework*

Options	Frequency	Percentage
Yes	40	100%
No	0	0%
Total	40	100%

Table 2 shows that 100% of the participants indicated that the 7Cs framework is comprehensive since it encompasses all the necessary skills of the twenty-first century. Nonetheless, some interesting skills are not prioritized in this framework such as: problem-solving, flexibility, risk-taking, self-assessment, and goal-setting. The absence of these skills limits the framework's effectiveness because learners need them to face the complexities of the twenty-first century digital learning contexts.

Table 3. *Summary of the Learners' Level of the 7Cs Framework Skills*

High level	Average level	Low level
1-Career and learning self-reliance (82.5%)	1-Critical thinking (57.5%)	1-Collaboration (35%)
2-Communication and media literacy (57.5%)	2-Creativity and computing and ICT literacy (50%)	2-Cross-cultural understanding (25%)
3-Collaboration (35%)	3-Cross-cultural understanding (47.5%)	3-Computing and ICT literacy (22.5%)
4-Creativity (30%)	4-Communication and media literacy (42.5%)	4-Critical thinking and creativity (20%)
5-Cross-cultural understanding (27.5%)	5-Collaboration (30%)	5-Career and learning self-reliance (5%)
6-Critical Thinking (22.5%)	6-Career and learning Self-reliance (12.5%)	

As indicated in Table 3, most of the participants (82.5%) considered their level of self-reliance as high whereas 12.5% of them viewed it as average. Only 57.5% of them claimed that their communication and media literacy level is high while 42.5% of them considered it as average. 57.5% of the respondents reported that their critical thinking level is average, and 22.5% professed that it is high. Half the population (50%) asserted that both creativity and computing as well as ICT literacy are average. 35% of the informants argued that collaboration level is high. In contrast, the same percentage (35%) indicated that collaboration is low. The rest of the population (30%) declared that their collaboration is average. Although cross-cultural understanding is an important 21st century skill, less than half the population (47.5 %) stated that its level is average. Only 27.5% indicated that their level of cross-

cultural understanding is high. To compare the seven skills statistically, results were analyzed using SPSS by counting the mean (M), the Standard Deviation (SD), Cronbach's Alpha (CA), and Chi-square for each skill based on students' responses:

Table 4. *Statistics of the Learners' Level Assessment of the 7Cs Skills*

Skill	M	SD	CA	Chi-square (χ^2)
Career and learning self-reliance	2.78	0.49	0.81	38.75 ($p < 0.001$)
Communication, information, and media literacy	2.58	0.50	0.76	6.75 ($p = 0.034$)
Collaboration	2.00	0.83	0.75	1.25 ($p = 0.535$)
Creativity	2.10	0.71	0.77	6.25 ($p = 0.044$)
Computing and ICT literacy	1.95	0.72	0.78	6.80 ($p = 0.033$)
Critical thinking	2.03	0.69	0.73	7.95 ($p = 0.019$)
Cross-cultural understanding	2.03	0.71	0.74	5.85 ($p = 0.054$)

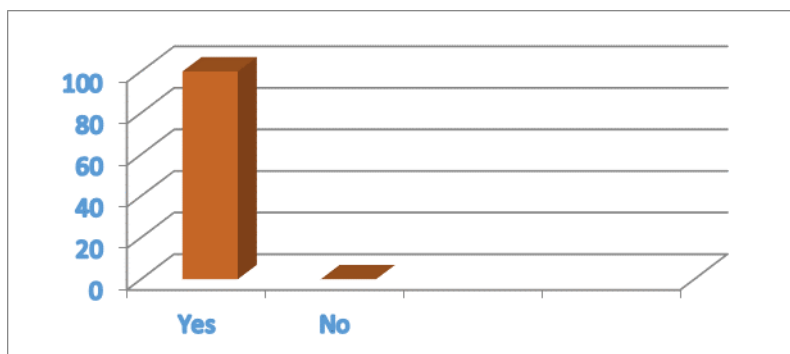
Note. Mean: *high* = 3 ; *average* = 2, *low* = 1

Based on the statistical analysis of the informants' responses, career and learning self-reliance emerged as the strongest twenty-first century skill, with a mean score of 2.78 and a low standard deviation of 0.49. This reflects learners' high self-reliance and independence from the teacher. The chi-square test for this skill yielded a highly significant result ($\chi^2 = 38.75$, $p < 0.001$), which highlights this skill as the most prominent one in the framework, as perceived by the participants. Communication and media literacy also showed a high mean score (2.58) with minimal variation ($SD = 0.5$) and a significant chi-square value ($\chi^2 = 6.75$, $p = 0.034$) that shows learners' second most prioritized skill. However, skills such as collaboration ($M = 2$, $SD = 0.83$), creativity ($M = 2.1$, $SD = 0.71$), computing and ICT literacy ($M = 1.95$, $SD = 0.72$), critical thinking ($M = 2.03$, $SD = 0.71$), and

cross-cultural understanding ($M=2.03$, $SD=0.71$) indicated lower mean scores and higher standard deviations, which ensures that learners' level ranges from average to low, with great variability among learners.

Cronbach's alpha values ranged from 0.73 to 0.81, which shows acceptable to good reliability of the framework items. Overall, these results highlight that while learners are autonomous and self-reliant, they highly need teachers' support in developing collaborative, critical, and intercultural competencies essential for learning in digital contexts.

Figure 2. *Learners' Perceptions of themselves as Digital Learners*



As shown in Figure 2, 100% of the learners affirmed that they perceive themselves as digital learners. This contradicts with data inferred from Table 3 where 50% of the participants maintained that computing and ICT literacy skills are average, while 22.5% of them admitted that the level of computing and ICT literacy skills is low. Ultimately, only 27.5% of the population is competent in computer sciences and ICTs.

Table 5. Qualities of Digital Learners

Options	Frequency	Percentage
-Tech-literate	30	75%
-Adaptable	32	80%
-Collaborative	23	57.5%
-Researcher and information seeker	36	90%
-Self-assessor	23	57.5%
Total	40	100%

To investigate whether learners are really digital, they were asked about the qualities they possess as digital learners. As shown in Table 5, the majority of the informants (90%) maintained that being a researcher and an information seeker is their strongest digital learning quality, which reflects a high level of independence and inquiry spirit. 80% of the participants reported that they are adaptable. This implies that they are ready to adjust to technological changes and new learning environments. 75% of the informants claimed that they are tech-literate, which shows their competence in using digital devices. More than half the population (57.5%) asserted that they are collaborative, which shows an average involvement in group work. The same percentage (57.5%) indicated that they are self-assessors. This reflects their ability to make self-reflection and self-improvement. Ultimately, learners are tech-literate, they have a high tendency to conduct research, and adapt their career to new challenges. However, not all learners are collaborative and self-assessors.

Table 6. *Teachers' Roles in Helping Learners Enhance the 7Cs Framework Skills*

Options	Frequency	Percentage
-Creating a learning environment that supports the 7Cs framework skills	37	92.5%
-Practicing computing skills in the classroom and increasing learners' ICT literacy	33	82.5%
-Encouraging cross-cultural communication through assignments	30	75%
-Enhancing critical thinking through Problem-Based Learning and authentic materials	25	62.5%
-Enhancing digital creativity	24	60%
-Increasing learners' self-reliance through independent active learning and self-assessment	28	70%
-Fostering teacher-learner collaboration and peers' collaboration especially in online settings	33	82.5%
-Encouraging Online Learning and online assessment	27	67.5%
-Using AI tools and applications to reinforce the digitalization of learning	32	80%

As displayed in Table 6, nearly all the participants (92.5%) reported that teachers have to create a learning environment that supports the 7Cs framework skills. 82.5% of the informants stated that teachers can promote learners' twenty-first century skills by practicing computing skills and fostering ICT literacy, as well as enhancing teacher-learner and peers' collaboration in

online settings. 80% of the informants maintained that the integration of AI tools and applications by teachers effectively supports the digitalization of learning. 75% of the participants stressed the value of encouraging cross-cultural communication through assignments. 70% of the participants argued that teachers can raise learners' self-reliance through independent active learning and self-assessment. 67.5% of the informants stressed the importance of encouraging online learning and digital assessment. 62.5% of the respondents concurred that teachers' role is to foster critical thinking through Problem-Based Learning. 60% of the informants noted that teachers can enhance digital creativity to ensure the success of digital learning by empowering 21st century skills.

4. Discussion

The results of this research showed that learners are totally independent and self-reliant; however, they are not really collaborative especially in online settings. Learners underestimate the effective role of collaboration as an essential 21st century skill, which coincides with the findings of the research conducted by Riaz and Din (2023) in Pakistan. Hence, learners' awareness of the importance of collaboration in learning should be raised by teachers. Creativity and critical thinking are also less valued by learners although learning cannot be digitalized without these two significant factors that are necessary for logical thinking, as confirmed by Paul and Elder (2006).

Furthermore, learners viewed the 7Cs Framework as comprehensive, this implies that they do not acknowledge the importance of problem-solving and self-assessment which are

neglected in the framework. As explained by some scholars (Ali, 2019; Lim, 2023), problem-solving skills can enhance learners' critical thinking level. Additionally, self-reliance requires self-assessment, yet not all the students are self-assessors (57.5%). Therefore, teachers have to encourage learners to make self-assessment so that they can raise their autonomy. Unlike traditional assessment, self-assessment in online settings is highly advocated since it ensures effective digital learning. In this respect, Martínez et al. (2020) administered a survey to 406 students of psychology at Oviedo University in Spain. They found that online self-assessment can promote metacognition and increase learners' academic achievement.

Learners cannot cope with the challenges of the 21st century with a low level of cross-cultural understanding. Although digitalization is supposed to facilitate cross-cultural communication (Lifintsev & Wellbrock, 2019), learners are unable to improve their cultural understanding. To solve to this problem, extensive exposure to the target culture through virtual platforms is needed, because it has a strong impact on intercultural communication and comprehension.

Although all the participants depicted themselves as digital learners, their digital qualities have distinct degrees. The highest digital quality (90%) was being a researcher and information seeker. This aligns with the findings of Madhlalose and Mlambo (2023) who contended that students in the digital age have a more tendency to conduct research thanks to the Internet and research engines. 80% of the population indicated that they are adaptable to new learning contexts, which shows their flexibility and readiness to use online platforms to achieve their learning

goals. Despite the fact that 75% of the learners perceived themselves as tech-literate, they maintained that their level of ICT literacy is only average or low. This reflects their need for ICTs' use in the classroom because of the effective role of technology in the application of 21st century skills. Madhlalose and Mlambo (2023) confirmed that ICTs have positive effects on learning.

The findings highlight teachers' pivotal role in fostering learners' 21st century skills. The majority of participants emphasized the importance of creating an inclusive learning environment that integrates technological tools, Artificial Intelligence Applications, and online collaboration. They further highlighted the role of cross-cultural communication, self-reliance, Problem-based Learning, and critical thinking in the teaching pedagogy. Although digital creativity ranked slightly lower, it remains an essential twenty-first century skill that can empower learners and help them solve complex problems, a fact that was confirmed by Pikhart et al., (2024) who encouraged teachers' employment of cooperative learning, games and Problem-based Learning.

5. CONCLUSION

The aim behind this research was to assess learners' digital skills. Quantitative data from the students' questionnaire revealed that while digital learners demonstrate self-reliance and adaptability, they underestimate collaboration, creativity, and critical thinking. They further have a low cross-cultural communicative competence and an average level of tech-literacy, which raises doubts about their readiness for the demands of 21st century learning. Hence, teachers have to address these shortcomings through thoughtful pedagogical

strategies and decisions that prioritize inclusive digital environments and empower learners through culturally informed creative learning. The findings of this research bring forth some pedagogical implications:

1-Lifelong learning is ensured when learners master 21st century skills especially digital skills.

2-Teachers' attention should be directed towards training students to improve their digital skills by focusing mainly on computing, information literacy and digital creativity.

3-Technology plays an important role in raising learners' access to the target culture and enhancing cross-cultural communication especially beyond the classroom; therefore, online collaboration is highly recommended.

4-Learners' digital creativity is encouraged by promoting learners' imagination and creative thinking through Cooperative Learning and problem-based tasks.

5-Conducting online research can foster learners' critical thinking through the process of evaluating sources, summarizing the results, synthesizing data and cross-cultural exchanges.

6. Bibliography

Ali, S. S. (2019). Problem based learning: A student-centered approach. *English Language Teaching*, 12 (5), 73-78.
<https://eric.ed.gov/?id=EJ1212283>

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M.,
Miller-Ricci, M., & Rumble, M. (2012). Defining Twenty-
First Century Skills. In P. Griffin, B. McGaw, & E. Care (Eds.),

Assessment and Teaching of 21st Century Skills (pp. 17-66). Dordrecht Springer.

- Chen, D. (2023). Toward an understanding of 21st-century skills: From a systematic review. *International Journal for Educational and Vocational Guidance*, 23, 275–294. <https://doi.org/10.1007/s10775-021-09511-1>
- Duncan, A. (2009). Statement from U.S. Secretary of Education Arne Duncan on results of NAEP Arts 2008 assessment. Washington, DC: U.S. Department of Education. Available at: www.ed.gov/news/pressreleases/2009/06/06152009.html.
- Larsen, L. C., & Miller, T. N. (2011). 21st century skills: Prepare students for the future. *Kappa Delta Pi Record*, 47 (3), 121-123
- Lifintsev, D., & Wellbrock, W. (2019). Cross-cultural communication in the digital age. *Estudos em Comunicação*, 1 (28), 93-104.
- Lim, T. (2023). Problem-Based Learning: Benefits, challenges, and the way forward. In K. Heng, K. Sol, S. Kaing, & S. Em (Eds.), *Innovations and challenges in Cambodian education: Youth's perspectives*. Cambodian Education Forum.
- Martínez, V., Mon, M. A., Álvarez, M. Fueyo, E. , & Dobarro, A. (2020). E-self-assessment as a strategy to improve the learning process at University. *Education Research International*, 1-9. <https://doi.org/10.1155/2020/3454783>
- Paul, R., & Elder, L. (2006). Critical thinking: The nature of critical and creative thought. *Journal of Developmental Education*, 30 (2), 34-35.
- Pikhart, M., Al-Obaydi, L. H., & Klimova, B. (2024). Does

digital learning stimulate creativity? *Cogent Arts & Humanities*,
11 (1), 1-9. DOI: 10.1080/23311983.2024.2407103

Riaz, M., & Din, M. (2023). Collaboration as 21st century

learning skill at undergraduate level. *Sir Syed Journal of
Education & Social Research*, 6 (1), 93-99.

[https://doi.org/10.36902/sjesr-vol6-iss1-2023\(93-99\)](https://doi.org/10.36902/sjesr-vol6-iss1-2023(93-99))

The Cambridge Framework for Life Competencies. (2020).

Cambridge University Press.

The Cambridge Framework for Life Competencies. (2021).

Cambridge University Press.

The Cambridge Framework for Life Competencies. (2022).

Cambridge University Press.

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our
times*. Jossey-Bass/Wiley.