
RESEARCH ARTICLE

Exploring Students' Perceptions towards Higher-Order Thinking Skills in Vocational Training in Morocco

Imad El arfaoui¹ and Khadija Anasse²

¹ Doctoral Researcher, Faculty of Languages, Literature, and Arts, Ibn Tofail University, Kenitra, Morocco.

² Professor of Higher Education, Faculty of Languages, Letters and Arts, Ibn Tofail University, Kenitra, Morocco.

Corresponding Author: Imad El arfaoui. **E-mail:** imad.elarfaoui@uit.ac.ma

ABSTRACT The cultivation of Higher-Order Thinking Skills (HOTS) in vocational and technical education has gained considerable priority, particularly given the rapid development of technology and the accelerating demand for non-routine cognitive competencies. Although Morocco has introduced national reforms that aim to embed analytical, evaluative, and creative dimensions within vocational programs, it remains necessary to understand how students perceive these initiatives and to what extent they experience HOTS being fostered during their training. The present study examines first-year students' perceptions of HOTS at OFPPT NTIC Rabat and employs a mixed-methods design combining a quantitative cross-sectional survey based on a Likert-scale questionnaire with qualitative open-ended responses. Forty-two first-year students enrolled in Information and Communication Technology programs participated in the study. Quantitative results indicate moderate HOTS-related conceptual understanding, with students demonstrating stronger awareness of the importance of HOTS for their future careers ($M = 3.86$) than of the specific cognitive processes involved ($M = 3.07$). Students also reported partial and inconsistent engagement in analysis- and problem-solving-based activities within their classrooms ($M = 3.71$ for critical-thinking prompts; $M = 3.50$ for problem-solving tasks). Qualitative findings reveal that approximately 70% of respondents were able to align their definitions of HOTS with Bloom's taxonomy cognitive levels of analysis, evaluation, and creation, while 20% were unable to provide a clear definition. Students further identified systemic barriers to HOTS development—notably time constraints, packed curricula, excessive rote memorization, and large class sizes. They recommended the integration of project-based learning, active methodologies, and professional teacher development as remedies. These findings highlight a meaningful gap between the national policy aspirations for HOTS integration and the actual classroom experiences of vocational learners, pointing to the urgent need for pedagogical reform within the OFPPT system.

KEYWORDS

Higher-Order Thinking Skills; TVET; student perception; vocational education; Bloom's Taxonomy

ARTICLE INFORMATION

ACCEPTED: 30 June 2026

PUBLISHED: 13 July 2026

DOI: 10.32996/jeltal.2026.8.8.9

1. Introduction

The world is currently shifting towards a knowledge-based economy, a transition that increases the demand for educational systems to cultivate Higher-Order Thinking Skills (HOTS). It is the ability to think critically about complex problems, evaluate multiple solutions using evidence-based reasoning, and generate new ideas (Abrami et al., 2015). As routine tasks become increasingly automated, technical and vocational education and training (TVET) systems worldwide are moving toward pedagogies that foreground non-routine cognitive competencies (World Economic Forum, 2020). This shift is essential to prepare graduates for a labour market profoundly transformed by the Fourth Industrial Revolution (Schwab, 2017).

In Morocco, national policy has placed the quality and relevance of vocational education at the forefront of its reform agenda. Official discourse consistently emphasizes the need to move beyond knowledge transmission toward developing creativity, critical thinking, and problem-solving capacities among learners (Qasrawi & Beni Abdelrahman, 2020). Yet research continues to surface persistent challenges, including teacher-centred instructional approaches that are fundamentally misaligned with the aspirations of cognitive skill development (Chouari & Nachit, 2016).

Although a body of research has examined HOTS in Moroccan general education, comparatively little attention has been directed at how students in vocational institutions specifically perceive HOTS, particularly within the rapidly evolving IT and Digital Technology sector. This gap matters because students' perceptions are among the most reliable predictors of their learning motivation, metacognitive awareness, and readiness to engage with HOTS-based strategies (Cents-Boonstra et al., 2021).

This research investigates how first-year students at OFPPT NTIC Rabat understand, experience, and perceive their development of/ or distance from HOTS within their vocational program. By combining quantitative and qualitative data, the study illuminates the extent to which current pedagogical practices effectively develop the analytical, evaluative, and creative capacities increasingly demanded in professional environments.

2. Literature Review

This section reviews the professional and academic literature pertaining to HOTS in vocational education in Morocco. It first establishes the theoretical framework underpinning HOTS, then discusses the essential roles of metacognition and self-regulation. It subsequently examines global and national imperatives for HOTS development within TVET, with particular focus on the Moroccan context. Finally, it reviews existing research on students' perceptions of HOTS and identifies the specific research gap addressed by this study.

2.1 Higher-Order Thinking Skills (HOTS)

Contemporary education is increasingly called upon to shift away from basic knowledge transmission toward equipping learners with the complex cognitive tools necessary for navigating dynamic professional and social environments (Abrami et al., 2015). This pressing need has placed HOTS at the centre of pedagogical discussions across disciplines. HOTS represent a level of cognitive engagement that goes beyond the simple recall of facts or the routine application of learned procedures; they encompass the ability to process, interpret, and manipulate information in order to solve novel problems, make logically grounded decisions, and produce new knowledge (Halpern, 2014).

2.1.1 Defining the Cognitive Hierarchy

The term "higher order" is always understood in contrast to lower-order thinking skills (LOTS). LOTS involve foundational cognitive processes—memorisation, recall, and basic comprehension—addressing the "how" and the "what" of known situations. HOTS, on the other hand, demand engagement with the "why," "how might we," and "what if," requiring deep and active intellectual involvement (King et al., 1994). Researchers commonly reference Bloom's revised taxonomy (Anderson & Krathwohl, 2001) as the organising framework for classifying these skills. The three highest levels of this hierarchy are:

- **Analysing:** Breaking material into its constituent parts, determining how those parts interrelate, and identifying underlying organisational structure or purpose. In a vocational context, this involves moving beyond surface indicators to identify root causes and contributing factors in complex technical problems.
- **Evaluating:** Making judgements based on specific, well-defined criteria and standards. This involves critically appraising solutions, procedures, or materials for efficiency or ethical reliability—for example, selecting the optimal network architecture by evaluating competing configurations against performance benchmarks.
- **Creating:** The highest level of cognitive output, involving the synthesis of elements into a coherent, functional, or novel structure. Creation equates to innovation and design, such as developing a bespoke industrial automation system or devising a new approach to data security.

Effective learning and professional problem-solving require learners to continuously oscillate between LOTS (for foundational knowledge retrieval) and HOTS (for novel application and synthesis). This dynamic process is not

automatic; it is intentionally managed by executive cognitive functions broadly referred to as metacognitive (Zimmerman, 2000).

2.2 Metacognition and Self-Regulation as the Engine of HOTS

For students to effectively apply and transfer HOTS across contexts, they must develop metacognition—commonly defined as "thinking about one's own thinking." This executive skill governs and coordinates the sequencing of higher-order cognitive processes. Metacognition is closely linked to self-regulated learning, which refers to the degree of voluntary control learners exercise over their own behaviours, motivations, and cognitive strategies (Zimmerman, 2000). Self-regulation operates through a sustained, cyclical process consisting of three phases:

1. **Forethought (planning):** Before commencing a task, the learner sets goals, plans their approach, and estimates the necessary resources. In a vocational setting, this may involve analysing a system fault, activating prior knowledge, and generating multiple diagnostic hypotheses.
2. **Performance control (monitoring):** During task execution, the learner actively monitors the selected strategy and tracks progress, performing self-correction in real time to identify errors.
3. **Self-reflection (assessing):** After task completion, the learner critically evaluates outcomes, identifying what worked and what did not, and why. This reflective phase enables continuous learning and strategy refinement (Paul & Elder, 2007).

Students who develop strong self-regulation demonstrate greater capacity to handle the complexity and ambiguity inherent in real-world HOTS tasks. Their sense of self-efficacy—their perception of their own ability to control and manage their thinking—is a vital predictor of their readiness to engage in cognitively challenging activities.

2.3 HOTS in Vocational and Technical Education

The imperative to develop HOTS within TVET is especially acute in the context of the Fourth Industrial Revolution (4IR), characterised by the convergence of digital, physical, and biological spheres (Schwab, 2017). As the 4IR rapidly automates routine, manual, and predictable tasks, the key human advantage in the modern workplace shifts toward competencies that cannot be easily replicated by machines: complexity management, uncertainty navigation, innovation, and non-routine problem-solving (World Economic Forum, 2020).

2.3.1 Global Imperatives and Pedagogical Shifts

Globally, education and training bodies recognise HOTS as essential for professional survival in the 4IR economy. A major concern is the "skills mismatch," wherein TVET graduates possess strong technical skills but lack the complementary transversal competencies—critical thinking, creativity, and self-management—increasingly demanded by employers (UNESCO-UNEVOC, 2024). The shift toward Education 4.0 promotes the integration of active and digital learning strategies, with HOTS being developed through methods such as problem-based, task-based, and project-based learning, simulations, and inquiry-based activities that require students to analyse, evaluate, and create (Zhang & Yang, 2023; Pharamela & Singh-Pillay, 2025). This transition demands a fundamental shift in the role of instructors: from knowledge transmission to cognitive coaching that scaffolds students' thinking processes.

2.3.2 The Moroccan Context: Challenges in TVET

His Majesty King Mohammed VI, in his speech on the 66th Anniversary of the Revolution of the King and the People, underscored the centrality of vocational training in the Moroccan economy, emphasising the need for quality enhancement and greater relevance as national priorities aimed at reducing youth unemployment and boosting economic competitiveness. This national vision requires a shift from narrow technical teaching toward the development of higher cognitive skills. However, research within the Moroccan educational system consistently identifies significant, interconnected barriers to this transition:

- **Didactic dominance:** Despite national curricular reform mandates, teacher-centred, transmission-based pedagogy remains prevalent. This approach prioritises information recall (LOTS) over opportunities for student dialogue, debate, and independent analysis (Qasrawi & Beni Abdelrahman, 2020; Chouari & Nachit, 2016).

- **Theory-practice gap:** Students report a pronounced disconnect between abstract, decontextualised training and the authentic problem-solving demands of real workplace scenarios (Zhao, 2024). Curricula are frequently designed around content mastery rather than around the experimental learning required for the development of analysis and synthesis.
- **Assessment misalignment:** Assessment systems predominantly test basic recall and procedural application (LOTS), failing to measure higher-order demonstrations such as original design or complex solution critique (Zohar & Dori, 2003). This systemic misalignment directs both teachers and students toward easily measurable LOTS outputs, effectively undermining all reform efforts.

2.4 Students' Perceptions of HOTS: Awareness, Attitudes, and Challenges

Understanding how students perceive HOTS is a prerequisite for addressing the barriers that impede their development. Student perceptions influence not only motivation but also the degree of engagement and effort invested in learning (Cents-Boonstra et al., 2021).

2.4.1 Awareness and Attitudes

Students generally hold positive attitudes toward the importance of HOTS, recognising that critical thinking and problem-solving are necessary for professional competency and career advancement in non-routine work environments (Urbayatun et al., 2020). This recognition is particularly pronounced among technical students who are acutely aware of the irreducible uncertainty inherent in real-world troubleshooting. However, this positive attitude frequently coexists with a lack of conceptual clarity. Students often struggle to articulate the distinction between applying a known procedure and analysing a system failure in an entirely novel context (Zhang & Yang, 2023). This metacognitive gap means that while students value HOTS, they may not know how to practise or improve them deliberately. Encouragingly, students report higher engagement and intrinsic motivation when HOTS are developed through active, interactive pedagogies such as problem-based learning and collaborative discussion, confirming their receptivity to pedagogical reform when learning is meaningful and participatory (Yu & Zin, 2023).

2.4.2 Perceived Challenges

Obstacles to HOTS development, from the student perspective, stem from a combination of internal (personal) and external (pedagogical) factors:

Internal barriers:

- *Foundational knowledge transfer:* Difficulty combining and applying prior knowledge to synthesise solutions for genuinely novel problems (Syafryadin et al., 2022).
- *Argumentation and inference:* Limited capacity to draw logical inferences, articulate complex analysis, or provide rigorous, evidence-based critique.
- *Emotional barriers:* Anxiety, nervousness, or diminished self-confidence when asked to generate original ideas, defend a solution, or engage in peer critique (Syafryadin et al., 2022). These emotional reactions directly constrain the intellectual risk-taking essential for genuine HOTS development.

External barriers:

- *Pedagogical dependency:* Research, particularly within the Moroccan context, consistently identifies high levels of student dependency on teachers, whereby learners prefer to receive information passively rather than engage in independent decision-making (Bellet et al., 2025; Chouari & Nachit, 2016). This deeply ingrained learning orientation is fundamentally at odds with the autonomous, self-regulated learning model required for HOTS engagement.
- *Time and resource constraints:* Students also perceive insufficient time and inadequate resources dedicated to complex thinking tasks, given the prevalence of high-stakes, knowledge-based examinations.

2.5 Summary and Research Gap

The literature reviewed establishes HOTS as a critical component of 21st-century vocational readiness, highlights a global and national imperative for their integration in TVET, and identifies multiple institutional and pedagogical barriers within Morocco. Crucially, the literature confirms that student perception, attitude, and awareness are key mediating factors in successful HOTS development, suggesting that reform efforts must first address the student experience directly.

A distinct gap remains in the existing research concerning the specific operational context of Moroccan TVET institutions (OFPPT), particularly in the highly specialised and rapidly evolving NTIC sector. No current studies specifically investigate how students at OFPPT NTIC perceive the mechanisms through which HOTS are—or are not—developed, including their awareness of HOTS categories, their attitudes toward required pedagogical shifts, and their perceived challenges within a highly technical and dynamic field. This study addresses that gap by offering a targeted, contemporary case study of this specific student population and context.

3. Methodology

3.1 Research Design

This study adopts a mixed-methods design to investigate first-year vocational students' perceptions of HOTS at the OFPPT NTIC institute in Rabat. A mixed-methods approach is appropriate for examining student perceptions, a multidimensional phenomenon that encompasses both quantitative measurement (e.g., levels of awareness, perceived HOTS integration) and qualitative description (e.g., personal explanations, perceived challenges, and recommendations). As Creswell and Plano Clark (2018) highlight, mixed methods capitalise on the complementary strengths of quantitative and qualitative data.

3.2 Participants

The study included 42 first-year students enrolled in NTIC programs at an OFPPT centre in Rabat. Participants were pursuing various diploma programs in the digital and IT sectors. The sample was drawn conveniently from students attending regular English classes who voluntarily agreed to participate. First-year students were specifically selected because, being at the outset of their vocational training, their initial perceptions of HOTS provide a valuable baseline for understanding both current training practices and the potential for early pedagogical intervention.

3.3 Instruments

3.3.1 Questionnaire

The study utilised a structured questionnaire designed by the researcher, grounded in established HOTS frameworks—principally Bloom's revised taxonomy (Anderson & Krathwohl, 2001)—and informed by prior research on critical thinking in vocational education contexts. The questionnaire had been previously piloted and comprised the following sections:

1. Introduction
2. General background information
3. Knowledge of HOTS
4. Integration of HOTS in classroom activities
5. Factors impacting HOTS development
6. Open-ended qualitative questions
7. Closing message

Sections 3, 4, and 5 employed Likert-scale items (1 = Strongly Disagree; 5 = Strongly Agree), measuring students' conceptual knowledge of HOTS, the degree to which HOTS were perceived to be integrated into their vocational training, and the factors perceived to influence their development.

3.3.2 Open-Ended Responses

The open-ended questions in Section 6 generated the study's qualitative data. Responses were examined to identify students' definitions of HOTS, descriptions of experiences that developed their thinking, perceived challenges, and suggestions for improving HOTS integration. These qualitative items served to contextualise and enrich the quantitative findings.

3.4 Procedure

The survey was administered via Google Forms during regular English classes in October 2025. Prior to participation, students were provided with a brief overview of the study's purpose and gave their informed consent. Participation was entirely voluntary, responses remained anonymous and confidential, and students were assured that their answers would carry no implications for their academic grades. Completion of the questionnaire took approximately 15 minutes. Data were automatically collected through Google Forms and subsequently transferred to SPSS for statistical analysis.

4. Results and Discussion

4.1 Students' Awareness and Conceptual Understanding of HOTS

Quantitative findings suggest that students demonstrate a moderate level of HOTS awareness. The mean score for general understanding of HOTS was 3.07 out of 5, indicating some conceptual familiarity alongside notable inconsistency. However, when measured against the perceived importance of HOTS for future vocational careers, the mean rose substantially to 3.86, reflecting a positive orientation toward HOTS as a professional asset. Students also showed moderate confidence in their ability to provide examples of HOTS ($M = 3.33$) and to distinguish reflective from rote-based learning ($M = 3.69$).

Taken together, these findings suggest that students recognise the value of HOTS in professional terms while simultaneously exhibiting a need for deeper conceptual development—a gap confirmed by the qualitative data. Approximately 70% of participants provided definitions consistent with recognisable cognitive frameworks, notably Bloom's taxonomy, characterising HOTS as encompassing analysis, evaluation, and creation as opposed to memorisation. Conversely, roughly 20% were unable to provide a coherent definition, underscoring the degree to which more abstract cognitive processes remain opaque to a significant minority of students.

4.2 Integration of HOTS in Classroom Practice

The perceived integration of HOTS in classroom activities yielded moderate scores across all indicators. Instructor encouragement of critical thinking questions received a mean score of 3.71, while activities requiring problem-solving and critical thinking received a mean of 3.50. These results point to some intentional HOTS-oriented activity while simultaneously suggesting that such activity is neither widespread nor consistent across instructors or courses.

Qualitative data corroborated these findings. A considerable number of students identified structured debates (45%), collaborative group work (40%), and project-based activities (35%) as the practices most conducive to deeper thinking. However, 15% of respondents reported encountering no such activities at all, underscoring a pronounced unevenness in HOTS integration—most probably a function of variation in instructor approaches, course content, or available resources.

4.3 Students' Recommendations for Supporting HOTS

Students' recommendations reveal a clear, coherent vision for how HOTS development could be improved. The most frequently cited suggestion was the incorporation of more practical, active learning and project-based approaches, advocated by 65% of participants. Additionally, 42% highlighted the need for teachers to receive appropriate

professional development in active methodology, while 40% called for greater use of debates and interactive group work. These recommendations are fully consistent with contemporary education research, which positions practical and collaborative learning approaches as powerful catalysts for HOTS development.

4.4 Perceived Barriers to HOTS Development

Among the most significant findings is students' clear identification of systemic barriers to HOTS development. Time constraints received a mean agreement score of 3.29, indicating moderate consensus around the perception that insufficient time is allocated to critical thinking activities. Qualitative data deepened this picture: 60% of students specifically identified packed curricula, excessive reliance on rote memorisation, and large class sizes as the primary obstacles. These systemic challenges represent structural barriers that will require coordinated institutional responses rather than isolated instructional adjustments.

5. Conclusion

This study set out to examine first-year OFPPT students' perceptions of Higher-Order Thinking Skills within the Moroccan vocational training system, drawing on both quantitative and qualitative data. The findings reveal a student population that possesses a generally positive orientation toward HOTS—correctly associating them with the higher levels of Bloom's taxonomy, including analysis, evaluation, and creation—while simultaneously perceiving that their training affords them insufficient opportunity to develop these skills in any consistent or meaningful way.

Students recognise the value of debates, collaborative tasks, and project-based activities, yet report that current pedagogical practice remains predominantly centred on rote learning and content drilling. The qualitative data, taken together with the broader literature on the Moroccan TVET system, points to systemic barriers—time constraints, traditional teaching approaches, and recall-based assessment regimes—as the principal impediments to HOTS integration in vocational education. Students' own recommendations, centred on project-based tasks, problem-solving activities, teamwork, and teacher professional development, align closely with the principles of Education 4.0 and offer a practical roadmap for reform.

Limitations of the Study

The study carries several limitations that should be acknowledged. First, the sample ($n = 42$) was drawn from a single OFPPT institution in Rabat, limiting the generalisability of findings to other vocational centres or regions. Second, data were entirely self-reported; while well-suited to studying perceptions, self-report data cannot be considered equivalent to direct observation of learning behaviours. Third, the quantitative instrument measured perceptions of HOTS rather than actual HOTS performance, so findings speak to what students believed about their own skills rather than what they demonstrably mastered. Fourth, time constraints precluded the collection of classroom observations or instructor interviews, which would have provided an invaluable complementary perspective on actual pedagogical practices.

Recommendations for Future Research

Future studies should expand the sample across multiple OFPPT institutions and disciplines—including IT, finance, and logistics—to enable cross-sector comparisons of HOTS development and the barriers that constrain it. Incorporating the perspectives of instructors and institutional administrators would further enrich understanding of the pedagogical and structural obstacles involved. Finally, experimental or quasi-experimental designs involving actual HOTS-promoting interventions—such as project-based or problem-solving tasks—would generate the causal evidence needed to move beyond perception studies toward genuinely actionable reform.

Statements and Declarations

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

ORCID ID

Imad El arfaoui: <https://orcid.org/0009-0002-7159-9594>

Khadija Anasse: <https://orcid.org/0000-0002-3237-3982>

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors, and the reviewers.

References

- [1] Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, A., & Persson, T. (2015). Strategies for teaching students to think critically: A meta-analysis. *Review of Educational Research*, 85(2), 275–314. <https://doi.org/10.3102/0034654314551063>
- [2] Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.
- [3] Bellet, M., Belghmi, M., & Belfakir, L. (2025). Students' Perceptions of EFL Teachers' Online Effectiveness in Post-COVID-19 Moroccan Higher Education. *Arab World English Journal*, 16(1): 235–251. <https://dx.doi.org/10.24093/awej/vol16no1.14>
- [4] Cents-Boonstra, M., Lichtwarck-Aschoff, A., Denessen, E., Aelterman, N., & Haerens, L. (2021). Fostering student engagement with motivating teaching: An observation study of teacher and student behaviours. *Research Papers in Education*, 36(6), 754–779.
- [5] Chouari, A., & Nachit, M. (2016). Teaching and assessing 21st century critical thinking skills in Morocco: A case study. *Arab World English Journal*, 7(4), 21–41. <https://doi.org/10.2139/ssrn.2898614>
- [6] Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE.
- [7] Halpern, D. F. (2014). *Thought and knowledge: An introduction to critical thinking* (5th ed.). Psychology Press. <https://doi.org/10.4324/9781003025412>
- [8] King, G., Keohane, R. O., & Verba, S. (1994). *Designing social inquiry: Scientific inference in qualitative research*. Princeton University Press.
- [9] Paul, R., & Elder, L. (2007). *Critical thinking: Tools for taking charge of your professional and personal life*. Pearson Education.
- [10] Pharamela, S., & Singh-Pillay, A. (2025). Technical and vocational education and training college lecturers and 21st-century skills awareness and implications for teaching practices. *Journal of Technical Education and Training*, 17(2), 182–196. <https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/19657>
- [11] Qasrawi, L., & Beni Abdelrahman, A. (2020). The higher and lower-order thinking skills (HOTS and LOTS) in Unlock English textbooks. *Arab World English Journal*, 11(4), 741–754.
- [12] Schwab, K. (2017). *The fourth industrial revolution*. World Economic Forum.
- [13] Syafriyadin, S., Wardhana, D. E. C., Noermanza, N., Rofi'i, A., & Awalludin, A. (2022). Students' perspective and problems in implementing higher order thinking skill (HOTS) in speaking for presentation class. *Journal of Language and Linguistic Studies*, 18(1), 477–487. <https://doi.org/10.52462/jlls.196>
- [14] UNESCO-UNEVOC. (2024). *Trends in new qualifications and competencies for technical and vocational education and training (TVET)*. UNESCO International Centre for Technical and Vocational Education and Training. https://unevoc.unesco.org/pub/bilt_trends_mapping_study.pdf
- [15] Urbayatun, S., Suyatno, Maryani, I., Bhakti, C. P., & Nursalim, M. A. (2020). Students' perception of higher-order thinking skills (HOTS) learning in West Nusa Tenggara. In A. Ashadi et al. (Eds.), *Teacher education and professional development in Industry 4.0* (pp. 278–289). CRC Press. <https://doi.org/10.1201/9781003035978-43>
- [16] World Economic Forum. (2020). *The future of jobs report 2020*. World Economic Forum. <https://www.weforum.org/publications/the-future-of-jobs-report-2020/>
- [17] Yu, L., & Zin, Z. M. (2023). The critical thinking-oriented adaptations of problem-based learning models: A systematic review. *Frontiers in Education*, 8, 1139987. <https://doi.org/10.3389/feduc.2023.1139987>
- [18] Zhang, X., & Yang, Y. (2023). A study on project-based learning and its impact on students' higher-order thinking skills. *Frontiers in Psychology*. <https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1202728/full>
- [19] Zhao, Z. (2024). Theoretical and practical exploration of work-based learning curriculum with a case study. *Vocation, Technology & Education*, 1(1), 1–12. <https://doi.org/10.54844/vte.2024.0518>
- [20] Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press. <https://doi.org/10.1016/B978-012109890-2/50031-7>
- [21] Zohar, A., & Dori, Y. J. (2003). Higher order thinking skills and low-achieving students: Are they mutually exclusive? *The Journal of the Learning Sciences*, 12(2), 145–181. https://doi.org/10.1207/S15327809JLS1202_1