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ORIGINAL RESEARCH PAPER

Future opportunities for teaching "career and technology" textbooks in lower secondary school education in Iran based on technological trends: a futures studies approach

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ABSTRACT

Background and Objectives: 'Career and Technology' Textbooks have the vital role in education in equipping students with technical skills, creativity, and digital literacy. The review of international studies highlights the rapid pace of technological change driven by digital transformation and new technologies like AI, VR/AR, 3D printing, and IoT. The paper argues that these trends challenge traditional teaching methods and create unprecedented opportunities for personalized and interactive learning. This study, using futures studies methods with a foresight approach—which constitutes a systematic, anticipatory, and analytical process for anticipating future changes and threats—identifies key technological trends and emerging educational opportunities in the 'Career and Technology' course. It aims to align the content of this course with future educational needs and skill requirements.

Methods: The research employed a mixed-methods (quantitative-qualitative) exploratory approach. The process was executed in three distinct stages: Step 1: Identifying Technological Trends: A systematic review of academic literature and educational reports was conducted to identify 11 key technological trends with the potential to influence 'Career and Technology' education. Step 2: Prioritizing Trends: A questionnaire was developed to rank the identified trends based on their potential to create opportunities in the next 5-7 years. The survey was sent to 60 experts, with 48 valid responses collected. The data were analyzed using SPSS26 and the Friedman test to rank the trends. Step 3: Identifying and Classifying Opportunities: Semi-structured interviews were conducted with 24 experts (university professors and teachers) to understand the benefits and impacts of the prioritized trends. The interview transcripts were analyzed using qualitative content analysis with ATLAS.ti software.

Findings: The Friedman test results (Chi-Square = 392.912, df=10, p<0.000) showed significant differences in the experts' rankings. The top three trends, based on their potential to create future opportunities, were: Artificial Intelligence (AI) (Average Rank: 9.84), Online Learning (Average Rank: 9.64), and Internet of Things (IoT) (Average Rank: 9.40). The qualitative analysis process generated 362 initial codes, which were then synthesized into 44 main themes representing the key opportunities. Key future-oriented opportunities identified include enhancing cognitive activity, blending hard and soft skills, and creating smart workshops, as well as personalizing learning, intelligent assessment, and safe, low-cost simulation. Additionally, updating the role of teachers, designing engaging technology-based content, automating processes, digital collaboration, real-world projects, virtual visits, and AI-assisted entrepreneurship education are highlighted, aligning the 'Career and Technology' course with future needs. Finally, the analysis categorizes the impact of the prioritized technological trends across the four essential domains of teaching and learning: Content Design and Production, Presentation and Teaching, Performance Assessment, and Learning Environment Management

Conclusion: The research affirms that technology is a key driver for transforming the "Career and Technology" course. The coming years should focus on personalized and deep learning (driven by AI) and facilitating safe, practical learning (driven by VR/AR and IoT). These opportunities are crucial for developing the hard and soft skills students need for the future project-based economy. Such comprehensive integration is essential for teaching these courses, equipping students with skills in adaptability, teamwork, and problem-solving, while simultaneously nurturing their ability in creative inquiry, data-driven decision-making, and effective collaboration within smart, technology-enriched environments. These are, in fact, the very competencies that fully align with the future-oriented opportunities identified by experts.

NUMBER OF REFERENCES 65 | NUMBER OF FIGURES 1 | NUMBER OF TABLES 7

مقاله پژوهشی

فرصت‌های آینده آموزش کتب «کار و فناوری» دوره متوسطه اول ایران مبتنی بر روندهای فناورانه: رویکردی آینده‌پژوهانه

مصطفی کشاورزترک

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چکیده

پیشینه و اهداف: کتاب‌های درسی «کار و فناوری» نقش حیاتی در آموزش، تجهیز دانش‌آموزان به مهارت‌های فنی، خلاقیت، و سواد دیجیتال ایفا می‌کنند. مرور مطالعات بین‌المللی بر سرعت بالای تغییرات فنّاورانه که توسط تحول دیجیتال و فناوری‌های نوظهور مانند هوش مصنوعی، واقعیت مجازی و افزوده، پرینت سه‌بعدی و اینترنت اشیا هدایت می‌شوند، تأکید دارد. این مقاله استدلال می‌کند که این روندها، روش‌های تدریس سنتی را به چالش می‌کشند و فرصت‌های بی‌سابقه‌ای را برای یادگیری شخصی‌سازی‌شده و تعاملی ایجاد می‌کنند. این پژوهش با بهره‌گیری از روش‌های آینده‌پژوهی (با رویکرد آینده‌نگاری) که یک فرایند نظام‌مند، پیش‌نگر و تحلیلی برای پیش‌بینی تغییرات و تهدیدات آینده است، به شناسایی روندهای کلیدی فناوری و فرصت‌های آموزشی نوظهور در درس «کار و فناوری» می‌پردازد. هدف آن، همسوسازی محتوای این درس با مهارت‌ها و نیازهای آموزشی آینده است.

روش‌ها: این پژوهش از یک رویکرد اکتشافی آمیخته (کمی - کیفی) استفاده کرده که در سه مرحله‌ی متمایز اجرا شده است: گام نخست، شناسایی روندهای فنّاورانه از طریق مرور نظام‌مند ادبیات و گزارش‌های آموزشی که منجر به شناسایی ۱۱ روند کلیدی شد .گام دوم، اولویت‌بندی روندها با توسعه و ارسال یک پرسش‌نامه به ۶۰ متخصص (با ۴۸ پاسخ معتبر (برای رتبه‌بندی پتانسیل ایجاد فرصت در ۵ تا ۷ سال آینده، و تحلیل داده‌ها با SPSS26 و آزمون فریدمن .گام سوم، شناسایی و طبقه‌بندی فرصت‌ها با انجام مصاحبه‌های نیمه‌ساختاریافته با ۲۴ متخصص و تحلیل محتوای کیفی با نرم‌افزار ATLAS.ti صورت گرفت.

یافته‌ها: یافته‌ها نشان داد که آزمون فریدمن (Chi-Square=۳۹۲/۹۱۲ ،df =۰/۰۰۰) تفاوت‌های معناداری در رتبه‌بندی متخصصان را تأیید کرد و سه روند برتر از نظر پتانسیل ایجاد فرصت‌های آتی عبارت بودند از: هوش مصنوعی میانگین رتبه (۹/۸۴)، یادگیری آنلاین میانگین رتبه (۹/۶۴) اینترنت اشیا میانگین رتبه (۹/۴۰) در بخش کیفی، تحلیل منجر به تولید ۳۶۲ کد اولیه شد که در نهایت در ۴۴ تم اصلی (فرصت‌های کلیدی) سنتز شدند. فرصت‌های کلیدی آینده‌محور شناسایی شده شامل تقویت فعالیت شناختی، ترکیب مهارت‌های سخت و نرم، و ایجاد کارگاه‌های هوشمند تا شخصی‌سازی یادگیری، ارزیابی هوشمند، و شبیه‌سازی ایمن و کم‌هزینه و همچنین به‌روزرسانی نقش معلمان، طراحی محتوای جذاب مبتنی بر فناوری، خودکارسازی فرایندها، همکاری دیجیتال، پروژه‌های واقعی، بازدیدهای مجازی، و آموزش کارآفرینی با کمک

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هوش مصنوعی است که جهت‌گیری درس «کار و فناوری» را با نیازهای آینده هماهنگ می‌کنند. و در نهایت تأثیر روندها را در چهار حوزه اساسی تدریس و یادگیری طبقه‌بندی کردند: طراحی و تولید محتوا، ارائه و تدریس، ارزیابی عملکرد، مدیریت محیط یادگیری.

نتیجه‌گیری: این تحقیق تأیید می‌کند که فناوری، محرک اصلی برای تحول درس «کار و فناوری» است. سال‌های آتی باید بر یادگیری شخصی‌سازی‌شده و عمیق (ناشی از هوش مصنوعی) و تسهیل یادگیری عملی و ایمن ناشی از واقعیت مجازی و اینترنت اشیا تمرکز کنند. این فرصت‌ها برای توسعه مهارت‌های سخت و نرم موردنیاز دانش‌آموزان برای اقتصاد مبتنی بر پروژه آینده، حیاتی هستند چنین یکپارچه‌سازی همه‌جانبه‌ای برای آموزش این دروس ضروری است که دانش‌آموزان را به مهارت‌های سازگاری، کار تیمی و مسئله‌یابی مجهز کند، و هم‌زمان توانایی آنان را در زمینه کاوش خلاق، تصمیم‌گیری مبتنی بر داده، و همکاری مؤثر در بستر محیط‌های هوشمند و فناورانه پرورش دهد در واقع این موارد همان ویژگی‌هایی هستند که کاملاً با فرصت‌های آینده‌محور شناسایی‌شده توسط خبرگان همخوانی دارد.

Introduction

Effective education is considered the foundation for economic, social, and cultural development in any society, and its primary mission is to cultivate a generation equipped with the necessary skills for the future [1]. In this context, the *Career and Technology* courses in the first grade of secondary school play a central role in developing students' practical competencies, technical skills, design thinking, and technological literacy, serving as a bridge between theoretical knowledge and practical application in daily life and future work environments. This course covers processes such as familiarity with tools and materials, the design and production process, project management, and product evaluation. The competencies acquired in this course are essential not only for success in higher educational stages but also for employability in the future job market, which is heavily influenced by technology [2].

The teaching-learning processes in this course, according to the evaluation standards of The Association for Educational Communications and Technology (AECT), as cited by Barto and Conklin [3], can be separated and analyzed into four main areas that technology can revolutionize: 1) Content Design and Production: Includes the creation of digital resources, simulations, and multimedia tools; 2) Presentation and Instruction: Includes the use of active, interactive, and personalized methods (such as flipped learning); 3) Performance Assessment: Includes measuring practical competencies instead of theoretical knowledge and providing precise feedback; and 4) Learning Environment Management: Includes the organization of resources, scheduling, and the safe management of workshops and projects. Since the 2000s, with the acceleration of the digital transformation phenomenon and the emergence of new technologies such as Artificial Intelligence (AI), Virtual and Augmented Reality (VR and AR), 3D printing, and the Internet of Things (IoT), all aspects of life, including educational systems, have undergone fundamental changes [4]. These technological trends have challenged traditional teaching methods and provided unique opportunities for personalizing learning, simulating complex environments, and making content interactive [5].

The Career and Technology course, due to its practical and technical nature, is particularly affected by these transformations. New technological tools have the potential to convert traditional workshop environments into virtual and interactive laboratories, allowing for the practice of complex or dangerous skills without physical limitations or high costs. These developments not only necessitate a review of the content and educational tools for this course but also directly lead to the emergence of innovative opportunities in the design of teaching aids, specialized practical assessment platforms, and the production of intelligent content. These educational-technological opportunities represent a combination of innovation in content, teaching methods, and the utilization of advanced technologies that can lead to increased effectiveness and attractiveness of the Career and Technology course, and ultimately, enhance students' skills to face the challenges of the Fourth Industrial Age.

Futures studies allows organizations, including educational institutions, to focus on desirable futures, not just those that are more probable. Desirable futures relate to what we, individually or collectively, want to happen in the future. Foresight helps educational leaders move from a passive, reactive mode (merely observing trends) to an active, transformative mode (shaping technologies and educational programs). Its vital role is to anticipate future threats and opportunities that affect complex systems in the long term [6]. Foresight goes beyond speculation; it is defined as a systematic, future-oriented, analytical, and interactive process. This systematic nature makes it a credible tool for "the systematic examination of future developments" [7].

Given the necessity of adapting educational content to the accelerating pace of technological change, the main goal of this research is to use a foresight approach and its tools to identify, analyze, and prioritize emerging educational opportunities in the Career and Technology courses of the first stage of secondary school, which will be shaped by future technological trends. This research seeks to answer these key questions:

- What are the technological trends with the greatest impact on Career and Technology education in the future?
- What educational and content opportunities will be formed for this course based on these trends?

This research can help educational technology specialists, textbook authors, and educational policymakers to design the path for transforming the content of Career and Technology courses with deeper insight, ensuring students are prepared for future job and skill requirements.

Review of the related literature

A significant portion of recent domestic literature focuses on the potential of technologies to enhance learning in higher education. The article by Hosseini Moghaddam [8] emphasizes the impact of global trends on higher education and the derived priorities for foresight in Iran. Using foresight methods, it identifies and analyzes four key areas—social accountability, national reputation and influence, transformation in education, and participatory governance—as foresight priorities for higher education in Iran. In the article by Olyaee et al. [9], a comprehensive review of the applications, opportunities, and challenges of Artificial Intelligence (AI) in universities is conducted, using a literature review approach and the experiences of pioneering global universities. The study shows that AI is gradually penetrating the educational, research, and administrative domains, playing an enabling role in the core processes of the university. Based on the evaluations, the research provides specific policy recommendations for the effective and sustainable utilization of AI in Iranian universities, emphasizing the enhancement of digital literacy, infrastructure development, and the formulation of data governance frameworks.

The research by Fazeli et al. [10], using a foresight approach, analyzes the probable scenarios of emerging trends in the teaching and learning of *Ma'arif* (Islamic Studies/Humanities) courses in universities. This aims to identify and improve teaching methods and learning models in this vital area in the face of rapid technological developments. The results of this study indicated that over the next ten years, learning trends will move toward creating dynamic learning environments, personalizing learning with adaptive technologies, increasing learner ownership, and reducing the formality of the learning environment, which necessitates comprehensive planning. Salimi et al. [11], in a systematic study using a qualitative approach and content analysis method, examined the effects of new technologies on future educational trends. The findings were categorized into two main themes: Positive Impact of Technology on Education, which included 40 sub-themes such as increased efficiency, reduced costs, and improved teaching processes; and Challenges of Technology and Education, which included 34 sub-themes such as incompatibility of standards, need for new infrastructure, management of complexity, and cultural impacts. Ultimately, this study concludes that attention and planning for a systemic change in the future educational system are essential, considering reciprocal interaction and smart learning.

The review of credible foreign articles clearly emphasizes novel technologies in education. Dorota et al. [12] presented a systematic review on AR, emphasizing that AR has become a credible and growing educational technology, particularly after the COVID-19 pandemic, due to increased interaction and better learning outcomes. Despite challenges such as cost and the need for technical skills, this research examined the current trends, benefits, and concerns related to the integration of AR in various educational fields such as life sciences, engineering, and health, and stressed the necessity of utilizing the superior features of this technology for positive educational outcomes. Chen et al. [13] conducted research with the aim of analyzing and mapping the evolution of topics and hidden trends in the field of educational technologies over four decades. They analyzed all articles published in the prestigious journal *Computers & Education* between 1976 and 2018. To achieve this goal, the Structural Topic Modeling (STM) method was applied to 3,963 articles to identify and compare research focal points, annual trends, connections between topics, and the main concerns of the countries/regions active in this field. The article by Burbules et al. [14] emphasizes that education is the main key to sustainable development and the improvement of human quality of life worldwide. It examines how education is being transformed in the information age by novel digital technologies. The current research summarizes five main trends of change in education (including goals, ecology, teaching-learning processes, and educational governance) in light of new technologies and warns that these reforms will only succeed with awareness of the potential risks of technology and by abandoning traditional approaches.

The use of *futures studies* concepts to map the future of education, especially the concept of future educational trends, has received considerable attention in recent years. The article by Dube and Wen [15] aimed to map out the changing trends of educational technologies in schools by analyzing and evaluating the predictions of the Horizon reports from 2011 to 2021 and examining their accuracy using bibliometric analysis. The research results indicated that mobile technologies and data analytics were consistently highlighted throughout this period, and the technology industry and market, rather than pedagogical or theoretical approaches, have been the main drivers of these technological trends in schools.

The Joint Research Centre of the European Commission, citing Tuomi et al. [16], prepared a report with the aim of identifying emerging trends (especially AI in education), predicting risks, and extracting potential opportunities. This is to help policymakers develop educational systems that are effective, human-centered, and compatible with new technologies. The report posits that the European Union is striving to adapt its educational system to this changing information environment with the goal of achieving the "Digital Decade" and the dual digital and green transition by 2030. In this research, digital technologies (such as Big Data, Blockchain, AI, and new generations of virtual worlds) are introduced as high-potential technologies that are creating a new social-technical revolution with high speed and transformative power.

The main objective of Mosad's [17] research was to review the recent literature in the field of educational technology to compile its latest trends in 2018. This research was conducted using a descriptive method, and its results presented 30 new trends in technology and education for that year. The ultimate goal of this compilation was to assist Egyptian students, researchers, and academic staff specializing in educational technology, as the transformations in educational technology are constantly revolutionizing teaching methods and creating new learning experiences. According to a study by Thompson et al. [18], the most important trends identified in 2021 included remote learning or work, the widening digital divide, and mental health issues (social); the adoption of blended learning (technological); and reduced higher education budgets and uncertainty in economic models (economic). The authors emphasize that despite institutional slowness in universities to respond to these trends and delays in research sharing (especially after COVID-19), new trends in technology, methodology, and educational practices continue to emerge. This article addresses the importance of trends in educational technology in higher education, noting that trends (which are both measurable and emerging) influence decisions regarding budgeting, infrastructure, and curriculum design.

The article by Akhmadov et al. [19] examines the use of innovative technologies in the educational process, including VR simulations and AI algorithms. The main objective is to explore the capacity of these technologies to transform education globally and increase accessibility for students of all ages and backgrounds. Furthermore, this article reviews current trends and the future outlook for technology education and offers practical recommendations for teachers on the best way to utilize these tools in classrooms. Wang et al. [20] conducted a study using the Delphi method to identify research trends and priorities in the field of educational technology from the perspective of scientific journal editors. After conducting three rounds of surveys with 25 editors, the final results indicated five main themes for trends and priorities: focus on computer-related aspects, teaching and learning, online and digital education, social aspects, and research and theory. The goal of this study was to provide valuable insights for better understanding the field and to help researchers publish high-quality, relevant articles.

Methods

Participants

The participant selection for this mixed-methods study was conducted in two distinct phases using non-probability purposeful sampling to ensure the inclusion of information-rich cases. For the quantitative phase, a sample of 60 experts was selected based on strict criterion sampling, requiring candidates to hold advanced academic degrees in educational or educational technology fields and possess a minimum of one year of relevant professional experience. This selection aimed to gather a qualified consensus for trend prioritization. The demographic characteristics of the research experts are summarized in Table 1.

Subsequently, the qualitative phase involved 24 specialized experts chosen through purposeful sampling for in-depth, semi-structured interviews. This smaller, focused sample was instrumental in achieving data saturation and obtaining rich, nuanced insights necessary to explore the underlying effects and ultimately categorize the identified technological opportunities within the curriculum. Table 2 presents the demographic characteristics of the research experts in the qualitative phase.

Table 2: Demographic characteristics of experts (Interviews)

Characteristic group	Number	Frequency (%)
Age		
25-35 years	15	62
35-45 years	7	30
Above 45 years	2	8
Education		
Bachelor's degree	5	21
Master's degree	12	50
PhD degree	7	29
Experience in the university/education sector		
1-3 years	7	29
4-7 years	14	58
More than 7 years	3	13

Instruments

Quantitative Instrument: Questionnaire

The core data collection tool for the study's quantitative phase (Prioritizing Trends) was a dedicated measurement questionnaire meticulously developed based on the foundational research. This instrument was crucial for moving beyond trend identification toward strategic prioritization. Its design and content development originated from the key technological trends (e.g., AI, VR, and Gamification) established through the comprehensive literature review in Step 1.

Table 1: Demographic characteristics of research experts (Questionnaire)

Characteristic	Group	Number of experts	Frequency (Percentage)
Age	25 - 35 years old	21	44
	36 - 45 years old	18	37
	Above 45 years old	9	19
Education	Bachelor's Degree	23	48
	Master's Degree	10	21
	Ph.D Degree	15	31
Experience in education	1 - 3 years	12	25
	4 - 7 years	28	58
	More than 7 years	8	17

The questionnaire was structured not merely to list these trends, but to explicitly assess their potential role in creating tangible educational and learning opportunities within the specific context of the Career and Technology curriculum over a defined 5-to-7-year foresight horizon.

To ensure the instrument's scientific rigor and relevance, its content validity was systematically established through a formal process of expert judgment. A preliminary draft of the questionnaire, complete with instructions and scaling mechanisms, was sent to 6 university professors' email addresses with expertise in educational technology and curriculum development. These academics were tasked with reviewing the tool based on three critical criteria: Relevance (the extent to which items measured the intended construct), Clarity (the unambiguous wording of items and instructions), and Completeness (the comprehensive coverage of all identified trends). Following their detailed feedback, which often involved suggested rephrasing or restructuring, the questionnaire underwent rigorous revision and refinement. This iterative process ensured that the final version, used for data collection from the 60 experts, possessed high content fidelity and academic consensus.

As shown in Table 3, the overall mean score of the experts' evaluations was 4.26 out of 5, and the face and content validity coefficient was calculated as 0.85. These results indicate that the measurement tool possesses adequate and acceptable validity. Therefore, the designed questionnaire was deemed valid in terms of linguistic style, alignment with theoretical literature, consistency with research objectives, and coverage of research dimensions. Following the implementation of minor suggested revisions, the instrument is ready for use in the main phase of the study. To assess the reliability of the measurement instrument, Cronbach's Alpha coefficient was employed. The results from the pilot test of the questionnaire on a small sample indicated a Cronbach's Alpha coefficient of 0.81 for all items. This value exceeds the standard threshold (typically 0.70), signifying a high degree of internal consistency among the questionnaire's items.

Table 3: Face and content validity assessment of the pilot questionnaire (Six experts)

Evaluation indices	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6
Linguistic alignment with Persian writing conventions	4	5	5	4	5	4
Alignment of questions with existing literature indices	4	3	5	5	5	4
Consistency of items with research dimensions	4	5	4	4	5	4
Reliability of questions in addressing research objectives	5	3	4	3	5	4
Necessity of adding or deleting items	3	5	4	5	3	4
Mean score of each expert	4	4.4	4.4	4.2	4.6	4

Qualitative Instrument: Semi-structured Interview

The primary instrument for the qualitative phase (Identifying and categorizing opportunities) was a semi-structured interview protocol. This protocol was indispensable for eliciting deep, contextualized expert insights that quantitative data could not provide. The interview questions were designed strategically to specifically follow up on the results of the quantitative phase; they focused on gaining a broader and deeper understanding of the benefits, effects, and practical applicability of the prioritized technological trends (as determined in the previous step). The structure of the protocol was intentionally semi-structured to maintain focus on the research objectives—ensuring consistent coverage of core themes across all 24 interviews—while also allowing for sufficient flexibility to pursue emergent ideas and capture the specialized, unique perspectives of the experts. Before implementation, the entire interview protocol, including the sequencing and wording of the core questions, was reviewed by subject matter experts. This review process confirmed the protocol's appropriateness, comprehensiveness, and alignment with the study's goal of identifying and categorizing the innovative potentials, thereby ensuring that the extracted data would be rich and directly relevant for the subsequent thematic analysis.

Design

The present study employed a sequential exploratory mixed-methods design, utilizing a combination of quantitative and qualitative approaches to identify and prioritize future educational-technological opportunities in the Career and Technology curriculum. Foresight methodologies are considered a vital tool for discovering creative potentials in the teaching of Career and Technology curriculum topics. The importance of this approach is amplified, especially when facing the increasing and variable advancements in the field of technology [21]. This design was chosen as it allows for an initial broad exploration of the field (qualitative/literature review), followed by systematic prioritization (quantitative), and a final, deeper qualitative exploration of the results. The overall process followed a sequential flow of phases, as illustrated in Figure 1.

Procedure

The methodology was executed in a clear sequential manner:

Step 1: Identifying Technology Trends (Exploratory phase). This step involved a systematic review of articles searched for future technological trends in the educational field, resulting in the identification and analysis of 43 relevant sources. A precise review and monitoring of these sources were conducted to extract 11 emerging trends highly relevant to education and learning.

Step 2: Prioritizing Trends (Quantitative phase). Utilizing the 11 identified trends, an expert-specific questionnaire was designed. The process involved assessing the validity and reliability of the instrument (as previously detailed, involving six university professors for content validity). The instrument was then used to collect the opinions of specialists and experts for the final prioritization of the trends (n = 48 valid responses).

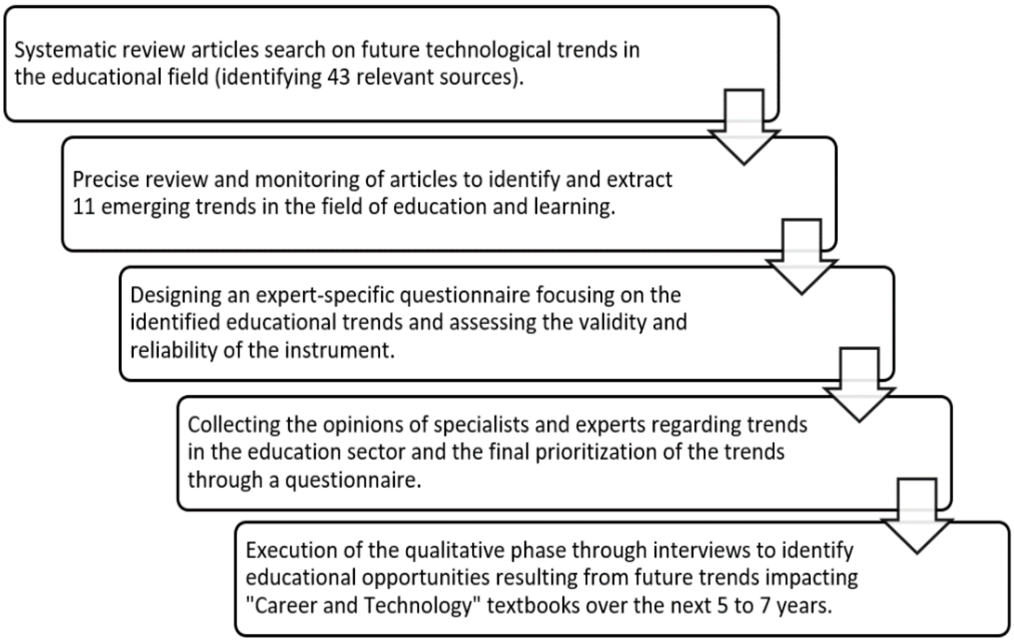

Fig. 1: Research flowchart and sequential design steps for educational-technological opportunity identification

Step 3: Identifying and Categorizing Opportunities (Qualitative follow-up). The final step involved the execution of the qualitative phase through semi-structured interviews with 24 experienced experts. This phase focused on identifying detailed educational opportunities resulting from the future trends prioritized in Step 2, specifically those impacting Career and Technology textbooks over the next 5 to 7 years.

Data Analysis

The analysis was conducted in two distinct stages, corresponding to the quantitative and qualitative phases of the design. In quantitative data analysis (Step 2), data gathered from the 48 valid questionnaires were analyzed using SPSS version 26. Given the objective of comparing the ranking or consensus among different categories of technological trends, the non-parametric Friedman test was employed. The primary goal of this analysis was to calculate and compare the average rankings of the 11 emerging trends to systematically determine which held the highest potential for creating innovative educational opportunities in the Iranian context. In qualitative data analysis (Step 3), the data extracted from the 24 semi-structured expert interviews were analyzed using thematic analysis. This rigorous procedure began with an initial process of text coding, during which 362 initial concepts were systematically extracted from the interview transcripts. Through subsequent aggregation, refinement, and synthesis, these concepts were ultimately consolidated into 44 thematic categories (core subjects). These 44 themes represent the most critical potentials for curricular improvement, teaching aids, and novel teaching methods within the subject of Career and Technology.

Results and Findings

This section presents the results obtained from executing the two main stages of the methodology (identifying and prioritizing trends, and identifying opportunities through interviews).

Identification and Prioritization of Technological Trends

The present study employed a rigorous Systematic Review (SR) methodology to comprehensively analyze the existing academic literature concerning “Technology” and “Education”. This method, chosen to ensure a transparent and bias-free synthesis of findings, began with the precise formulation of the research question: "What are the effective technologies in education?" A subsequent search strategy was executed across the Google Scholar database, utilizing the key combination: (Technology) AND (education) AND (systematic review) in both English and Persian. The search scope was strictly limited by inclusion criteria, focusing only on full-text, peer-reviewed journal articles published between 2015 and 2025, while excluding items such as technical reports and industrial studies.

Following the initial search, the two-stage screening process—involving the removal of duplicates and an assessment of titles and abstracts by researchers—resulted in the selection of 79 articles. A final, meticulous assessment of the full texts led to a core sample of 33 articles deemed compatible with the study's objectives. Data extraction from these final articles included details on publication year, research approach, and key findings. The synthesized data were then subjected to Inductive Content Analysis, where initial codes were generated and grouped into sub-categories. This rigorous process ultimately yielded 11 technological trends (see Table 4) that were identified as having the potential to influence teaching-learning processes, especially in practical subjects like Career and Technology.

Table 4: Technological trends impacting the future of the education sector

Row	Technological trend in education	Sources
1	AI	[22]; [23]; [24]; [25]; [26]; [27]
2	IoT	[28]; [29]; [30]; [31]
3	3D printing	[32]; [33]; [34]
4	AR and VR	[12]; [35]; [36]; [37]; [38]
5	Blockchain technology	[39]; [40] ; [41]; [42]
6	Online learning	[43]; [44]; [45]
7	Gamification	[46]; [47]; [48]; [49]
8	Wearable technology	[50]; [51]; [52] ; [46]
9	Cloud-based learning	[53]; [54]; [55], [56]
10	Social networks and collaborative learning	[57]; [58]; [59]
11	Metaverse in education	[60]; [61]; [62]; [63]; [64]; [65]

Table 5 reflects the prioritization carried out regarding the likely and high-potential technological developments. Based on these findings, experts predict that over the next 5 to 7 years, technologies focusing on AI, Online Learning, and the IoT will be the main trends shaping innovative opportunities in the education of Career and Technology courses (see Table 6).

Table 5: Implementation of the Friedman Test for ranking educational technological trends

Test	Chi-Square value	Degrees of freedom	Significance level
Friedman Test	392.912	10	0.000

Table 6 presents the ranked importance of the 11 identified technological trends based on the experts' opinions, as determined by the Friedman test.

Table 6: Output and analysis results of the Friedman Test

Technology trend	Mean rank	Mean	Standard deviation	Priority
AI	9.84	4.87	0.334	1
Online learning	9.64	4.77	0.592	2
IoT	9.40	4.69	0.803	3
AR and VR	6.96	3.83	0.694	4
Gamification	6.90	3.72	0.706	5
Social networks and collaborative learning	6.68	3.81	0.606	6
Metaverse in education	4.73	2.93	0.665	7
Wearable Technology	4.72	2.95	0.459	8
3D printing	2.79	2.04	0.459	9
Blockchain technology	2.74	2.01	0.617	10
Cloud-based learning	1.61	1.25	0.729	11

In this research, with a focus on education, AI and Machine Learning technology were identified as the most important trend for creating educational-technological opportunities, which indicates the significance of personalized learning and adaptive assessment in the future of Career and Technology education.

Identification of Educational Opportunities (Interview Analysis)

To identify the educational-technological opportunities arising from the prioritized trends, 24 semi-structured interviews were conducted with experts (including faculty members and high school teachers). By executing the coding steps, 362 initial codes were extracted from the 24 expert interviews during the open coding phase. These interviews were conducted semi-structurally. The coding process was performed with the help of ATLAS.ti software. Based on this, the information was initially grouped, and the ideas derived from the open coding were organized into 44 categories or groups. Subsequently, the phrases extracted during the open coding were merged based on content alignment (or similarity).

Discussion

The findings of this study, underpinned by the Friedman test (Chi-Square = 392.912, df=10, $p<0.000$), indicate statistically significant differences in how experts perceive the potential of various technological trends to shape future opportunities in teaching “career and technology” at the lower secondary school level in Iran. This strong statistical significance underscores a consensus among experts regarding the differential impact of these emerging technologies on the educational landscape.

Of particular note, AI, online learning, and the IoT emerged as the leading trends, garnering the highest average ranks from the experts. The paramount importance assigned to AI (Average Rank: 9.84) suggests a widespread recognition of its transformative capabilities within education. This aligns with a substantial body of literature [22-27] in our review, which consistently highlights AI’s potential to personalize learning experiences, automate administrative tasks, and provide intelligent tutoring systems. For the context of Iranian lower secondary education, this implies a critical need to integrate AI concepts and tools into the curriculum and teacher training, preparing students for an AI-driven future workforce and equipping educators with AI-enhanced pedagogical strategies.

Table 7: Opportunities for teaching-learning processes extracted from interview analysis

Opportunity code	Opportunity (Theme)	Gamification	VR/AR	IoT	Online learning	AI	Opportunity related to the teaching of Career and Technology textbooks
401	Activating cognitive activity	*	*		*	*	AI-powered tools force students to ask better and more precise questions, which accelerates the process of acquiring knowledge and activating cognitive abilities in solving complex technical problems.
402	Blending hard and soft skills	*	*	*	*	*	Designing small entrepreneurship projects based on IoT to strengthen digital literacy skills, computational thinking, and technological entrepreneurship.
403	Creating smart workshops	*	*	*	*	*	Equipping workshops with shared 3D printers or simulation games. Access to online resources and simulators, and networking schools.
404	Reduced cost, automated solutions, and increased return	*	*	*	*	*	The cost of automated solutions decreases compared to in-person instruction, while their return increases due to accumulated learning.
405	Designing engaging educational content aligned with current technologies	*	*	*	*	*	Innovation in educational content: The teacher, freed from repetitive instruction, finds more time to design new, engaging projects relevant to labor market needs. They can design projects centered on AI, IoT, and robotics that align with student interests.
406	Preparedness for dynamic economy: Rapid synchronization with labor market demand		*		*	*	Every project in the Career and Technology course simulates a job mission. This course teaches students how to manage and execute a defined project from start (design) to finish (implementation and product delivery). The Career and Technology course transforms from a traditional unit into a skill accelerator that can rapidly incorporate new skill modules based on current market demands (such as basics of AI, IoT, or simple cybersecurity) into its curriculum.
407	Ownership over challenges: from surface learning to deep mastery of technical skills	*	*	*	*	*	Instead of following instructions, the student seeks to discover solutions and overcome technical challenges independently. This increases the sense of ownership over learning and deeply internalizes problem-solving skills.
408	Change in the competencies of managers and teachers	*	*	*	*	*	Future managers and teachers must acquire the competence to utilize technology; otherwise, they will quickly be recognized as a barrier to the learning process.
409	Passive vs. active use		*	*	*	*	Schools should focus on the active, thoughtful, and critical use of technologies, not passive consumption.

Opportunity code	Opportunity (Theme)	Gamification	VR/AR	IoT	Online learning	AI	Opportunity related to the teaching of Career and Technology textbooks
410	Transition to design thinking	*	*		*	*	Instead of relying solely on linear instructions, the course content should focus on the iterative problem-solving cycle. Students use online tools to first define the real problem, then proceed to ideation, rapid prototyping, and testing. This approach makes "Innovation and Technology" modules the core of the course.
411	Assessment of process with digital portfolio			*	*		Instead of relying solely on the final product, online platforms should be used to create a digital portfolio. This portfolio allows for the documentation of work steps, photos, programming code, and peer or self-assessment throughout the process (e.g., documenting the project in electronics and construction modules).
412	Simulation before construction	*	*	*		*	Used for the virtual design and testing of electronic or mechanical projects. This drastically reduces workshop hazards, material costs, and trial-and-error time before moving to the physical construction phase.
413	Activating textbook images		*		*	*	The student points their phone at a 2D diagram of an electric circuit, and the 3D model of that circuit, with moving currents or detachable components, appears on the screen.
414	Smart design and construction tools		*	*		*	Students can use generative AI tools to assist with initial product design, simulate trial-and-error, and automatically troubleshoot circuits or code.
415	Continuous optimization of technical content		*			*	Curriculum design based on failure and success patterns: Providing precise data to the teacher for improving project designs in future years; for example, if 90% of students fail at a specific project stage, machine learning analysis indicates that part of the content needs to change.
416	Reducing tool barriers: using applications as smart tools		*		*	*	Use of mobile applications as alternative or auxiliary tools; for instance, using Augmented Reality measuring tools for quick dimensioning, or specialized calculators and unit converters (like converting electrical units).
417	The teacher's central role shifts from information conveyor to guide		*			*	With the automation of repetitive tasks by AI and technology, the teacher's central role will shift from an information conveyor to a guide, coach, learning experience designer, and student progress analyst. Instead of focusing on repetitive, step-by-step instruction (now handled by AI and instructional videos), the teacher can dedicate their time to one-on-one coaching. They can provide specialized guidance to each student based on their specific project and help them solve technical and creative challenges.
418	Identifying difficult moments in the learning process			*	*	*	Identify difficult moments in the learning process for timely human intervention.

Opportunity code	Opportunity (Theme)	Gamification	VR/AR	IoT	Online learning	AI	Opportunity related to the teaching of Career and Technology textbooks
419	Automatic remote supervision for test Administration				*	*	Provide automatic remote supervision for test administration.
420	AI-based assessments for fairer evaluation					*	Instead of comparing students to a fixed standard, AI assesses how much each student has progressed relative to their starting point (based on initial assessment data).
421	personalized learning			*	*	*	Technologies help adjust content based on student performance, which aids in developing problem-solving and critical thinking. Adjusting the pace, content, and difficulty level of technical lessons (like teaching design software or coding modules) based on the student's individual needs and preferences. Career and Technology projects can be personalized based on each student's skill level, interest, and learning speed.
422	Facilitating answer seeking for learners		*	*	*	*	Provides practical solutions for improving learning through e-learning platforms, chatbots, and automated assessment and control systems. If a student encounters a problem while working with a tool (e.g., how to calibrate a sensor), they can receive step-by-step guidance from AI without interrupting the teacher's focus.
423	Analysis of student learning data: performance assessment based on practical behavior data in the workshop		*			*	AI reports to the teacher which students (based on initial assessment performance) are most likely to make errors or need practical assistance. This optimized focus allows the teacher to spend their time on students who genuinely need one-on-one help, rather than general supervision.
424	Automation of administrative tasks	*		*	*	*	Automation of administrative tasks, which can reduce the workload of instructors.
425	Providing automatic feedback			*	*	*	AI-based platforms can offer questions that match the individual's level of understanding and provide automatic feedback, which allows students to learn at their own pace.
426	Real-life practical projects	*	*	*		*	Building simple models of sensors, small home automation systems, or smart irrigation systems, or simple environmental sensors using educational kits.
427	Use of sensors and internet-connected devices			*		*	For data collection in the physical classroom environment (e.g., how students interact with educational tools).
428	Training sustainability engineers: Optimization of energy and			*		*	Using smart plugs or energy consumption sensors to measure and reduce resource consumption in the workshop. This teaches students skills in sustainability management and optimization of manufacturing processes.

Opportunity code	Opportunity (Theme)	Gamification	VR/AR	IoT	Online learning	AI	Opportunity related to the teaching of Career and Technology textbooks
	material consumption						
429	Targeted teacher intervention: focusing on at-risk students before errors occur			*		*	Analyzing student data to predict which individual is currently most likely to fail the project or use a tool unsafely.
430	Facilitating group discussions, communication, and collaboration skills				*	*	Collaborative platforms such as wikis, discussion forums, and social media facilitate project-based learning and group discussions, allowing students to learn from each other and improve their communication and collaboration skills.
431	Rapid prototyping	*	*	*	*	*	Students can prototype and test their design ideas quickly and at low cost, which directly contributes to strengthening the innovation and technology modules.
432	Learner-generated educational content: sharing construction experiences				*		Students can easily share their project documentation (such as short instructional videos, construction stage images, or design files) on these networks. This turns rich content produced by the students themselves into an educational resource for future years.
433	Smart assistants		*		*	*	Smart assistants can provide precise technical guidance and help students with troubleshooting while coding for robotics projects or working with specialized software.
434	Entrepreneurship education with AI		*		*	*	Using AI tools for market analysis and identifying consumer needs, and assisting students with naming, brand design, and marketing final products for Career and Technology projects.
435	Developing digital collaboration skills: project management in a social context		*		*		Group projects, whose management and coordination are done through online collaboration tools, directly strengthen teamwork, conflict management, and effective communication skills in a technical context.
436	Safe and low-cost workshop simulation: beyond physical limitations		*	*		*	AR and VR enable the simulation of dangerous workshop environments (like working with cutting tools or electricity) without risk to life or waste of raw materials.
437	Visual guidance during construction: accelerating assembly and practical troubleshooting		*			*	Teaching the stages of assembling and troubleshooting complex devices with AI-powered instructions displayed on the real object. Using VR glasses or tablets to overlay 3D instructions onto the actual workbench. For example, when assembling an electronic circuit, VR shows the student exactly where each component is placed and which wire connects to which point. The student can view the different internal layers of a device and interactively diagnose and replace faulty parts without opening the actual device.

Opportunity code	Opportunity (Theme)	Gamification	VR/AR	IoT	Online learning	AI	Opportunity related to the teaching of Career and Technology textbooks
438	Virtual visits to factories and occupations		*	*	*		The possibility of accessing industrial and work environments that are physically or financially inaccessible through virtual tours, which deepens the student's understanding of careers and technological applications.
439	Online and remote learning of theoretical parts of the Career and Technology course				*		The theoretical parts of the course, such as design fundamentals, familiarity with tools, and production stages, can be delivered to students through online learning. This allows in-person class time to be entirely dedicated to practical and workshop tasks. The teacher can prepare short instructional videos of project stages (e.g., how to work with software or the steps to build a simple robot). These videos serve as self-study content, allowing students to progress at their own pace and review content as needed.
440	Online and blended education	*			*	*	The widespread development and adoption of blended learning models that combine in-person classes with flexible, self-paced online components to increase accessibility and flexibility in the time and location of learning. Tools (like video conferencing or online whiteboards) enable teachers and students to collaborate remotely while maintaining communication through visual cues (like body language). These tools facilitate the definition of group projects.
441	Remote collaboration				*		For group projects, students can use online tools like Google Docs for planning, designing, and project management. This can be done before the in-person work begins in the workshop.
442	Verification of student credentials and electronic certificates				*		Connecting with future careers by converting classroom achievements into real-world credentials in the job market. Providing an official and valid document for every skill acquired, which the student can use as an attestable achievement on their resume.
443	Increasing motivation and practical perseverance: skill training in game format	*	*				Converting project stages into gamified missions. Instead of 'cutting the piece,' the student receives a 'Precision cut badge.' A quick quiz or game assesses knowledge of basic tools (saw, drill, design software) or core concepts (safety, basic electricity). (Competition or game for initial assessment) VR technologies enhance student motivation and understanding by providing engaging simulations.
444	Gamified missions	*					Creating project teams that must share their knowledge and solve each other's problems to receive higher scores. Converting complex project stages (like precise cuts or electronic circuit wiring) into 'levels' or 'gamified missions.' This makes the course engaging and encourages students to perform their work with higher accuracy and speed to earn more points.

Similarly, online learning (Average Rank: 9.64) was ranked exceptionally high. The COVID-19 pandemic accelerated the adoption and acceptance of online learning globally, and our expert panel's ranking reflects its perceived sustained importance [45-50]. This trend presents significant opportunities for expanding access to quality career and technology education, particularly in geographically dispersed areas of Iran. It necessitates the development of robust digital learning platforms, engaging online content, and effective methods for facilitating online collaboration and assessment in technology-focused subjects.

The Internet of Things (Average Rank: 9.40), securing the third position, signifies a growing awareness of its potential to create practical, hands-on learning experiences. As noted in the literature [51-55], IoT enables the development of smart environments and connected devices, offering unique avenues for teaching principles of hardware, software, networking, and data analysis tangibly. For Iranian schools, leveraging IoT could involve creating 'smart classrooms' or incorporating IoT projects into technology curricula, thereby fostering crucial skills in system design, data interpretation, and problem-solving.

These top-ranked trends – AI, online learning, and IoT – collectively point towards a future where technology education is more personalized, accessible, and experiential. The strong expert consensus provides a clear directive for curriculum developers and policymakers in Iran to prioritize these areas when planning the evolution of Career and Technology textbooks and teaching methodologies.

The thematic analysis of the interviews (see Table 6) presents a comprehensive mapping of opportunities for enhancing teaching-learning processes within Career and Technology education, as extracted from the qualitative interview analysis. The table categorizes these opportunities by theme (Opportunity Code) and cross-references them with key technological drivers, including Gamification, VR/AR, IoT, online learning, and AI. This multidimensional view illustrates how specific technological integrations can transform traditional textbook instruction into dynamic, skill-oriented learning experiences. Finally, the analysis below is presented based on how technologies impact each of the four main teaching-learning processes, with a focus on the Career and Technology course. The impact of these trends, broken down by the four key areas of teaching-learning processes, is as follows:

Content Design and Production

Virtual and Augmented Reality and online simulations are highly crucial in this area. These technologies create opportunities such as Simulation Before Construction (Opportunities 412 and 431) and the production of self-study content. Generative AI, by creating opportunities for smart design and construction tools (Opportunity 414), helps students with rapid prototyping and troubleshooting of initial designs, and shifts the teacher's central role to that of an innovative content designer (Opportunities 417 and 432).

Presentation and Instruction

Artificial Intelligence and Machine Learning (Priority Trend 1) bring about a fundamental transformation in this area. Opportunities such as facilitating individual learning and design thinking (Opportunity 410), activating cognitive activity, and personalized learning (Opportunities 421 and 401) directly stem from AI's capabilities. The teacher evolves from an information conveyor to a technical consultant and guide for student-centered projects (Opportunity 417), which is made possible by the automation of repetitive processes by technology. The use of gamification and VR/AR for safe workshop simulation (Opportunity 436) and increasing motivation (Opportunity 437) makes learning more engaging and practical.

Performance Assessment

Big data and AI set the stage for fairer assessment (based on progress) (Opportunity 420) and process assessment with a digital portfolio (Opportunity 411). The use of the IoT and sensors creates an opportunity for data-driven performance evaluation and assessing students' practical behavior in the workshop (Opportunity 423). Furthermore, automated feedback and the continuous optimization of technical content based on student performance data (Opportunities 415 and 425) become possible.

Learning Environment Management

Online learning technology provides the main infrastructure for online and blended education (Opportunity 440) and remote collaboration (Opportunity 441), giving the Career and Technology course content flexibility (Opportunity 406) to synchronize with labor market demand. The use of IoT creates an opportunity for creating smart workshops and training sustainability engineers (by optimizing energy consumption in the workshop - Opportunity 428). Additionally, AI can assist with targeted teacher intervention for students at risk before errors occur by providing data analysis (Opportunity 429).

Conclusions

In this era of profound technological transformation, including smart and networked technologies, the nature of education, training, and the development of individual capabilities have fundamentally changed. The current suite of technologies has created a massive shift in learning and instruction. The classic education system is becoming obsolete, and opportunities for accelerated, easier, and cheaper learning are emerging. Second-generation AI technologies have the potential to enable personalized, individual learning activities and support. A main issue, however, is that teachers are not integrating new technologies into the classroom as expected, with many merely using them as digital substitutes for old tools. The aim of this research was to identify innovative opportunities in the Career and Technology course in Iran's first stage of secondary school, based on technological trends, and to provide a desired future vision for educational policymakers, educational entrepreneurs, and Career and Technology teachers in the country.

The findings of this research indicate that the five main technologies that will have the greatest impact in shaping innovative opportunities in Career and Technology education over the next 5 to 7 years are: AI and Machine Learning, online and blended learning, IoT, VR/AR, and gamification. AI ranked first by experts; AI will have the greatest impact on the areas of Presentation and Instruction and Performance Assessment. With capabilities such as personalized learning, empowering the teacher for targeted coaching, and analyzing student learning data for timely intervention, this technology sets the stage for educational opportunities. Online and blended learning provide a flexible and scalable infrastructure for Learning Environment Management. Opportunities like online and blended instruction, remote collaboration, and process assessment with a digital portfolio are directly dependent on the capabilities of this technology. Virtual and Augmented Reality ranked in the middle; these technologies create fundamental opportunities in the areas of Content Design and Production and

Presentation and Instruction. This includes safe and low-cost workshop simulation, visual guidance during construction (with VR/AR), and virtual visits to factories to increase student motivation and understanding. Internet of Things, by enabling the collection and analysis of IoT sensor data in the workshop, creates opportunities in the Performance Assessment and Learning Environment Management sections. This technology can help educational institutions continuously optimize technical content and make data-driven decisions with a more precise view. Gamification, converting complex project stages into computerized game missions, makes the course engaging and encourages students to perform their work with higher accuracy and speed to earn more points.

The findings of this research indicate that the integration of technology into teaching approaches and the learning process for Career and Technology topics plays a central role in the transformation of these textbooks. Accordingly, business owners and educational experts can leverage these opportunities for innovation and enhancement of educational outcomes. These opportunities can have a favorable impact on students' ability to enter the project-based economy and develop hard and soft skills.

This study showed that in the coming years, the focus should be on personalized and deep learning (driven by AI) and facilitating safe and practical learning (driven by VR/AR and IoT). This focus should be at the core of the attention of educational policymakers, Career and Technology teachers, and educational entrepreneurs. By focusing on technological trends and how they influence the creation of innovation opportunities across diverse areas of Career and Technology education, this research succeeded in mapping a new and comprehensive vision. These results have the capacity to serve as a guiding document for entrepreneurs, investors, and curriculum designers in the educational sector. Utilizing these identified opportunities, creative individuals can proceed to establish new companies or expand existing services: development of AI-based assessment platforms: to create tools for fairer assessment (based on individual progress) and provide automatic feedback in technical projects; design of VR simulation modules: to build safe and low-cost workshop simulators for practicing complex or dangerous technical skills; and development of digital collaboration tools: to create online platforms for fostering digital collaboration skills and managing group projects in the Career and Technology course.

The opportunities identified through interview analysis for optimizing teaching-learning processes. It details how various technological tools (gamification, VR/AR, IoT, online learning, and AI) align with specific educational themes to enhance the delivery and impact of Career and Technology textbooks. This paper argues for utilizing mobile applications as auxiliary tools, such as AR-based measurement tools for rapid dimensioning or specialized digital unit converters for electrical engineering modules. Also, as AI automates repetitive instruction, the teacher’s role shifts from a lecturer to a coach, mentor, and learning experience designer. This transition allows educators to focus on personalized, one-on-one technical coaching and creative problem-solving guidance. If machine learning analysis identifies a high error rate (e.g., 90%) at a specific project stage, it signals a necessary curriculum adjustment. So, future Career and Technology authors could move beyond fixed standards toward AI-based assessments that measure individual progress relative to a student's unique baseline/starting point by leveraging technology to adjust the pace, complexity, and content of technical modules (e.g., coding or design software) based on individual student performance, interests, and learning speeds. They could also use chatbots and e-learning platforms to provide immediate, step-by-step technical guidance (e.g., sensor calibration) without disrupting the teacher's instructional flow. They can also use AI to analyze practical workshop behavior and predict which students require intensive assistance, thereby optimizing the teacher's time and focus, and analyze real-time student data to predict which individuals are at highest risk of error, enabling proactive rather than reactive intervention.

The main limitation of this study was the difficulty in accessing experienced experts in education and technology. This challenge led the researchers to use a semi-structured interview method. To enhance the validity of the results, future researchers are advised to utilize alternative methodologies such as expert focus groups or scenario analysis with expert participation to discover and validate further opportunities. Conducting statistical research to measure the validity of the identified opportunities with a larger number of educational specialists.

Authors' Contribution

The research ideas, execution, article writing, and data analysis were primarily the responsibility of the first author (corresponding), Mustafa Keshavarz Turk.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this material. Furthermore, the authors certify that this material has not previously been published and that it is not now being considered for publication elsewhere.

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