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Are 21st Century Skills Still Relevant in the 21st Century?

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Abstract

In the years leading up to the 21st century, technology began transforming almost every aspect of how we live, learn, and work. From the rise of the Internet to the emergence of artificial intelligence, these changes have reshaped the skills that students need to succeed in today's digital and interconnected world. This paper explores how the Four Cs of 21st Century Skills (collaboration, communication, critical thinking, creativity) have been incorporated in computing fundamentals courses over the past 25 years. By analyzing national student engagement surveys, evolving standard ACM/AIS/AITP computing curricula, and a widely used introductory computing textbook, this study provides a longitudinal perspective on how computing education has adapted to meet the demands of today's ever-changing workforce. This paper addresses a gap in the literature by providing a longitudinal comparison using these different sources across 25 years, offering insights into how computing education has integrated, and in some cases, overlooked, essential 21st Century Skills. It also highlights growing attention to skills such as ethical reasoning, adaptability, empathy, and entrepreneurial thinking, which are increasingly relevant to how students learn, solve problems, and take initiative in technology-assisted learning environments.

Keywords: 21st Century Skills, Model Curriculum, Fundamentals of Computing course

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1. INTRODUCTION

While 21st Century Skills have been a central part of the discussion on effective learning outcomes for more than two decades, few studies have compared how these skills have evolved with national student engagement data, formal computing curricula, and foundational textbooks during the past quarter-century. This paper fills that gap by providing a longitudinal analysis, from engagement metrics to model curricula to instructional materials, to gain a better understanding of how 21st Century Skills have been incorporated into computing education. Recent trends show that CIS curricula have increased focus on critical thinking and problem-solving skills as students analyze problems and create original solutions (Lyytinen et al., 2021). Project-based learning is on the rise, especially in the current era of artificial intelligence (Abulibdeh et al., 2025), and that requires students to develop collaboration and communication skills and demonstrate proficiency in basic technology tools and platforms. The rapid pace of digital transformation and the widespread use of data-driven technologies have fundamentally reshaped necessary technology skills (Cummings et al., 2025).

While the early 2000s focused on basic computer literacy and productivity tool usage, the emphasis has now shifted to digital fluency, or the ability to critically evaluate, learn, and apply new technological tools for effective problem-solving (Fleming et al., 2021). The artificial intelligence (AI) era has also required students to consider how to use the latest tools effectively, ethically, and responsibly, requiring technological proficiency (Frydenberg et al., 2025; Zhang et al., 2025).

Examining how curricula, employers, and textbooks prepare Information Systems (IS) students to enter a technology-driven workforce will demonstrate the ongoing need to evolve relevant 21st Century Skills.

This research aims to address these questions:

RQ 1. How are 21st Century Skills relevant to IS education?
RQ 2. How have model IS curricula and textbooks responded to technological change while promoting 21st Century Skills?
RQ 3. Are 21st Century Skills still relevant 25 years later? What additional skills need to be included?
RQ 4. What implications do these changes have for education and workforce development?

2. LITERATURE REVIEW

Twenty-first-century skills include a set of competencies and knowledge areas considered necessary for success in a world where the impact of, and reliance on, technology is critical. The Partnership for 21st Century Learning ("P21 Resources | 21st Century Learning Resources," n.d.) developed a set of measurable skills and outcomes necessary for digital students to succeed as global knowledge workers. These four C's (critical thinking, communication, collaboration, and creativity) augment the three R's (reading, writing, and 'rithmetic) of the 20th century.

The Four Cs remain relevant at the beginning of the second quarter of the 21st Century, yet recent literature suggests that 21st Century Skills in a business context extend to integrate digital aspects (Van Laar et al., 2020) and interpersonal skills, to navigate the impact of technology successfully. Technology-enabled project-based learning develops communication, collaboration, and problem-solving skills, which employers highly value over basic content knowledge (St. Louis et al., 2021). Students need to acquire data literacy, problem-solving, programming, and creative thinking to remain competitive in the workforce (Birru, 2024).

Along with information literacy as an essential 21st Century Skill (Khan et al., 2022; Zhang et al., 2025), emphasis on innovation and entrepreneurship is increasingly present. Research shows the importance of integrating entrepreneurship in the IS curriculum, focusing on essential skills of tech startups (Jones & Liu, 2017; Lang & Babb, 2015) for preparing graduates for the ever changing job market.

Researchers have also emphasized the importance of digital ethics (Young et al., 2018) and the responsible use of technology, including the Internet, mobile devices, and artificial

intelligence (Paltiel et al., 2023) and data practices (Hand, 2018) as essential 21st Century Skills. As technology evolves, students must consider the ethical dilemmas and implications of using AI, data privacy, and other advancements from multiple disciplinary perspectives (C Yallop & Aliasghar, 2020; Sharples, 2023). This includes the ability to evaluate the credibility, quality, and accuracy of digital or AI-generated information to make justifiable decisions (Federiakin et al., 2024; Remmik et al., 2024).

The challenges of the modern workplace, often called the "new normal", also demand resilience as an essential skill for 21st Century workers (Foteini & Angela, 2022) who need to adapt to changing work environments. Finally, Dondi et al. (2021) identify empathy as a crucial skill, with an emphasis on digital citizenship, interdisciplinary learning, and the impact of social media. Learners must "appreciate the world through the eyes of others (Dondi et al., 2021)" in contexts such as user interface design, addressing bias, and developing leadership skills.

3. METHODOLOGY

This study utilizes a mixed-methods approach combining literature review, comparative analysis, and historical evaluation of curricula to examine how 21st Century Skills have been integrated into IS education during the past 25 years. The narrative will progress from a macro perspective down to the micro perspective. The intent of moving from the macro to micro levels is to tease out whether 21st Century Skills are being addressed at the entire student body versus those skills that the information Systems field felt were needed for their discipline majors.

A five-point scale (see Table 1) was used to evaluate the presence of 21st Century Skills: Critical Thinking, Communication, Collaboration, Creativity, and Digital Literacy, in each data source. Each author independently analyzed one of the three sources; the NSSE surveys, Information Systems model curricula, or editions of *Discovering Computers,* based on their subject-matter expertise. Ratings were informed by both explicit mentions and implied presence of each skill. While inter-rater reliability measures were not employed, the division of labor allowed for a focused, contextually informed evaluation of each domain. To ensure consistency, the authors reviewed and discussed each other's rating rationales and summary tables to ensure alignment in interpretation and scale usage. The authors acknowledge this as a limitation and recommend future work include formal inter-rater reliability procedures across sources.

Ranking	Interpretation
0	Barely present / Non-existent
1 ■	Somewhat present
2 ■■	Moderately present
3 ■■■	Strongly present
4 ■■■■	Very strongly present

Table 1: Ranking Presence of 21st Century Skills

At the macro level, the National Survey of Student Engagement (NSSE), an instrument which "provides educators with an estimate of how undergraduates spend their time and what they gain from attending college" (*National Survey of Student Engagement*, 2021), informs this discussion. At the intermediary level, the evolution of the I.S. Model Curriculum (Davis et al., 1996; Gorgone et al., 2003; Leidig & Salmela, 2020) provides insights since the model curriculum addresses technology at both the MIS major/minor and technology skills needed for the whole student body. Finally at the micro level, examining several editions of *Discovering Computers* (Shelly et al., 1999), a popular textbook for teaching introductory computing concepts shows when new technologies were taught (relative to when they were introduced) and different skills required to assess student learning.

Across each area, the authors employed a scale ranging from 0 (Barely Present/Non-Existent) to 4 (Very Strongly Present), as shown in Table 1. Qualitative coding is used to evaluate how NSSE, model curricula, and a popular computing fundamentals textbook reflect the evolving definitions of 21st Century Skills.

4. EVOLUTION OF STUDENT ENGAGEMENT SURVEY RESULTS

The National Survey of Student Engagement (NSSE 2025 U.S. English Version, 2025; *The NSSE 2000 Report: National Benchmarks of Effective Educational Practice*, 2000) provides insights into relevant technology skills for undergraduate students. This analysis focuses on the perceived skills that students need, not on the actual skills that students possess, by examining the survey instrument itself. Each question from the 2000 and 2025 NSSE surveys was coded according to each of the Four Cs (critical thinking, communication, collaboration, and creativity)

plus digital literacy, often defined as the ability to use information and communication technologies to find, evaluate, create, and share information (Khan et al., 2022; Riel et al., 2012), to determine the level of emphasis each of these had in the survey, applying a 5-point scale for each category.

Based on an evaluation of the NSSE surveys from 2000 and 2025t, Tables 2 and 3 present a side-by-side comparison of how 21st Century Skills have evolved in undergraduate education during the past 25 years.

NSSE 2000	
Critical Thinking ■■■	Clearly present, but mostly through mastery of discipline content. Focused on academic rigor in specific courses
Collaboration ■■■	Clearly present in in-person, course-based interactions to support academic success
Communication ■■	Moderately present, through class discussions or presentations
Creativity	Not present; little or no assessment of originality, innovation, or problem solving
Digital Literacy ■	Barely present; mentioned only in use of electronic communications or email

Table 2: Presence of 21st Century Skills in NSSE 2000

While the NSSE 2000 survey reflected traditional educational environments focused on content mastery and in-person learning, the 2025 version captures a broader, dynamic skill set aligned with contemporary educational methods. This evolution represents a shift from assessing students mastery of content to evaluating their performance of technology-enabled competencies across a variety of learning environments. Many of the dimensions noted in the 2025 survey, including ethical reflections, adaptability, and entrepreneurial thinking and perspective taking, point to a growing recognition of skills beyond the Four Cs. Table 3 shows the presence of 21st Century skills in the NSSE 2025 survey, which are more fully integrated, reflecting the needs of today's digital and collaborative world.

NSSE 2025	
Critical Thinking ■■■■	Very strongly embedded, including integrative, and cross-disciplinary thinking and making connections between ideas in different course
Collaboration ■■■■	Very strongly present; expands to working effectively in technology-enhanced and globally diverse teams
Communication ■■■■	Emphasized across written, oral, and interpersonal communication; across, diverse and digital contexts
Creativity ■■	Moderately present through high-impact projects, research, or integrative assignments
Digital Literacy ■■■■	Fully integrated across course and assignments, supports research, collaboration, and using technology to communicate, create, and reflect on one's learning

Table 3: Presence of 21st Century Skills in NSSE 2025

Figure 1 summarizes these findings, showing that each skill increased in emphasis from 2000 to 2025. By 2025 all skills except creativity scored highest as *Very Strongly Present* indicating that these skills were considered essential for student success. The NSSE's has aligned with evolving educational practices and employer expectations. While 2000 captured the novelty of digital tools, 2025 reflects a reality where digital literacy is not optional, it is foundational to how students learn, collaborate, and demonstrate competence.

In addition to the Four Cs, entrepreneurship was indirectly addressed through experiential learning in 2000, but 2025 NSSE highlights innovation and ownership of learning, key aspects of entrepreneurship.

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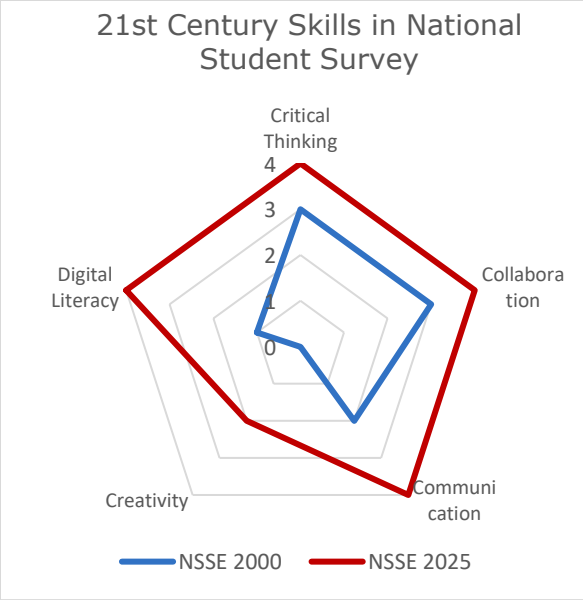

Figure 1: 21st Century Skills in NSSE

5. EVOLUTION OF INFORMATION SYSTEMS MODEL CURRICULA AND 21st CENTURY SKILLS

The Association for Information Systems (AIS) and Association for Computing Machinery (ACM) with other partner organizations offered four major curriculum revisions in 1997, 2002, 2010, and 2020. The linkages between IS and business in IS 2002 represent the relevance of the Four Cs and digital literacy combined with business fundamentals, as interpreted by the authors, illustrated in Figure 2.

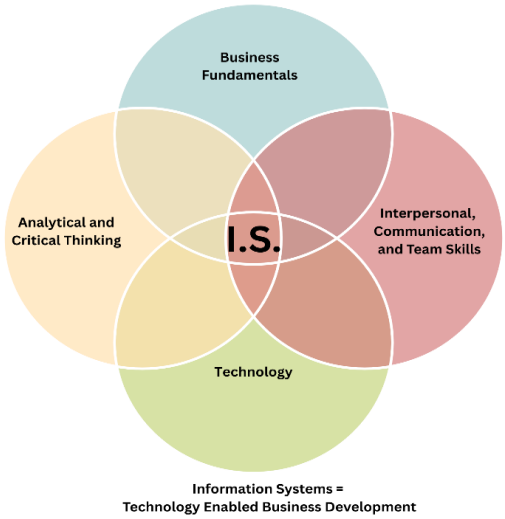

Figure 2: Components of Information Systems.

For each curriculum revision, the authors subjectively evaluated each 21st Century skill based on the scales as shown in Table 1.

IS '97 Model Curriculum

The IS '97 model curriculum (Davis et al., 1996) developed by AIS and ACM laid the foundation for undergraduate Information Systems (IS) education, and supported but predated the formal recognition of 21st Century Skills. IS '97 introduced. Students to essential technology topics such as hardware, software, databases, and networking, it also emphasized systems knowledge over soft skills. Critical thinking appears in the context of a systems analysis course and in the digital literacy course. Creativity, communication, and collaboration were either assumed or minimally mentioned, with few learning outcomes targeting these competencies.

Tables 4 and following present the authors' averaged independent assessment score of the presence of critical thinking, collaboration, communication, creativity, and digital literacy in each curriculum's Fundamentals of Information Systems course description.

IS '97 Model Curriculum	
Critical Thinking ■■	Systems analysis required problem solving and structured thinking
Collaboration ■	Mentioned in team projects, but not a focus
Communication ■	Expected, but not taught or assessed
Creativity ■■	Implied in system design, and home computer use, but not formally developed.
Digital Literacy ■■	Focus on hardware, software, and early Internet tools

Table 4: Presence of 21st Century Skills in IS '97 Model Curriculum.

Although not designed with 21st Century Skills in mind, IS '97 provided technical foundations upon which later curricula would build skill development in collaboration, communication, and creativity.

IS 2002 Model Curriculum. The IS 2002 Model curriculum(Gorgone et al., 2003) introduced coding as a way to build critical thinking. Group projects promoted teamwork and creativity were encouraged through developing solutions to business problems. Table 5 summarizes how the

IS 2002 foundations course aligns with the Four Cs and digital literacy.

IS 2002 Model Curriculum	
Critical Thinking ■■■	Required for IS professionals, especially problem solving
Collaboration ■■	Emphasizes teamwork and interpersonal skills
Communication ■■	Listed as a skill, but not a focus area
Creativity ■■	Encouraged through prototyping and developing solutions
Digital Literacy ■■■	Focused on core technology concepts in hardware, software, networks

Table 5: Presence of 21st Century Skills in IS 2002 Model Curriculum.

IS 2010 Model Curriculum. IS 2010 (Topi et al., 2010) marked a major pedagogical shift by integrating leadership, ethics, and interdisciplinary knowledge along with technical competencies in foundation courses. It expanded IS applications across industries and emphasized soft skills alongside technical expertise. Creativity and digital literacy became essential in understanding and using IS tools.

Table 6 summarizes the presence of 21st Century Skills in the computing fundamentals course of the IS 2010 curriculum.

IS 2010 Model Curriculum	
Critical Thinking ■■■■	Framed as a central skill, along with ethical reasoning
Collaboration ■■■■	Emphasizes teamwork, leadership and interpersonal skills
Communication ■■■■	Recognizes written and oral communication as necessary skills for effective IS professionals
Creativity ■■■■	Developed through prototyping solutions and creatively using IS tools to solve business problems
Digital Literacy ■■■■	Focuseson productivity tools (spreadsheets, word processing, browsers) to support business decision-making

Table 6: Presence of 21st Century Skills in IS 2010 Model Curriculum.

The importance of working on diverse teams, developing leadership skills, and understanding user requirements all provide opportunities for students to appreciate the perspectives of others, essential when developing empathy as an additional 21st Century Skill.

In addition, the IS 2010 undergraduate model curriculum identifies ethical analysis as "one of the foundational knowledge and skills categories (Topi, 2014)." "Two notable content areas missing from the curriculum include the tools for analysis of ethical issues and incorporating ethics in the design process. (2014, p. 32)" Graduates need strong models and frameworks to analyze the implications and potential ethical and moral consequences of emerging technologies like AI and blockchain, due to the complex ethical issues they present. (Lyytinen et al., 2021)

IS 2020 Model Curriculum. A move toward competency-based thinking and the rapid growth and changing roles of digital technologies throughout society were prime motivators for the IS 2020 Model Curriculum (Leidig & Salmela, 2020).

Table 7 summarizes the presence of 21st Century Skills in the computing fundamentals course of the IS 2020 curriculum.

IS 2020 Model Curriculum	
Critical Thinking ■■■■	Applied to data and systems analysis, business decision making
Collaboration ■■■■	Required for work on cross-functional teams
Communication ■■■■	Emphasizes importance of explaining processes and findings and interacting with stakeholders
Creativity ■■■■	Integrated into use of emerging technologies, and data visualization
Digital Literacy ■■■■	Distributed across the use of productivity tools and incorporating them in decision making

Table 7: Presence of 21st Century Skills in IS 2020 Model Curriculum.

The project-based focus of the IS 2020 curriculum (Leidig & Salmela, 2020) also recognizes application development as a core competency, reflecting an entrepreneurial mindset. Its competency-based model promotes adaptability, applying skills across contexts, iterative design and responding to feedback, key elements of

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flexible learners. Its focus on "people, processes, and organizational users" shows the need for empathy in understanding stakeholders' needs.

Together, these curricula show an evolution from technical literacy (IS '97) to integrating teamwork and creativity (IS 2010) to a full competency alignment (IS 2020). Figure 3 illustrates these trends by charting the values for each skill in each curriculum revision as shown by the ■ above. a strong, balanced focus across all skills.

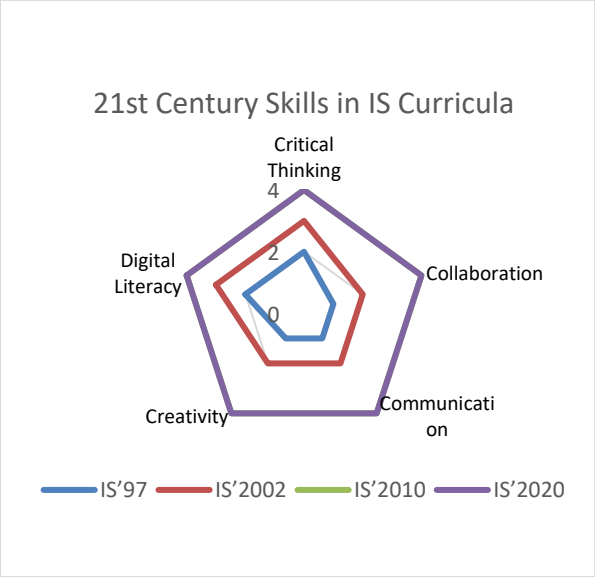

Figure 3: 21st Century Skills in IS Curricula.

Comparing how the Foundations of Information Systems course in each of the IS Curricula from 1997 to 2020 emphasize 21st Century Skills, the small shape of IS 97 shows minimal emphasis on 21st Century Skills. The shape of IS 2002 increases somewhat to have moderate focus across all skills, especially critical thinking and digital literacy. IS 2010 and 2020 form complete (overlapping) pentagons, showing a significant effort in integrating the Four Cs as core educational goals.

6. EVOLUTION OF DISCOVERING COMPUTERS AND 21st CENTURY SKILLS

Discovering Computers (Shelly et al., 1999) is the title of a series of introductory computing textbooks that originated in the 1980's when Gary Shelly authored its first edition, published by the former Course Technology, now part of Cengage Learning. It has been updated regularly (see Figure 4) and used by millions of students in computer concepts courses.

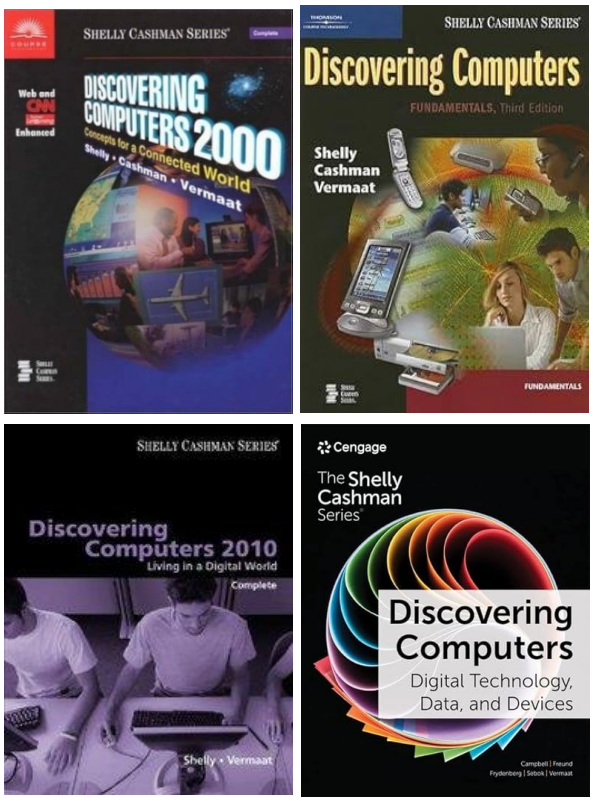

Figure 4: *Discovering Computers* covers from 2000, 2007, 2010, and 2023 illustrate the influence of technology in the digital world, and the shift from a focus on the Internet and devices to collaboration and data visualization.

Table 8 maps each exercise type to its related 21st Century Skill and corresponding levels of Bloom's Taxonomy (Bloom, 1956) and shows the evolution from emphasis on memorization to applying technology concepts.

Symbols used are:

- 🧠 (Critical Thinking).
- 💬 (Communication),
- 🤝 (Collaboration), and
- 🎨 (Creativity).

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Exercise Type	Description	Four Cs	Bloom's
Chapter Review	Recap of key concepts via summaries, T/F, multiple-choice, matching questions.		Remember
Key Terms	Glossary reinforcement via definitions and term identification exercises.		Remember
Checkpoint	Concept-check T/F, matching, brief answer items.		Apply
Learn It Online	Interactive, web-based activities to reinforce chapter concepts		Analyze
Learn How To	Step-by-step instructions to complete a common task		Apply
Web Research	Guided online research tasks		Analyze
Case Studies	Practical examples of ethics and issues, technology at work, or technology innovator profiles		Evaluate
Problem Solving	Practical scenario-based or computational exercises.		Evaluate
Critical Thinking	Prompts for evaluating, defending, or critiquing information		Evaluate
Collaboration	Group-based or peer collaboration activities.		Create

Table 8: *Discovering Computers* Exercises, 21st Century Skills, and Bloom's Taxonomy

Figure 5 shows how the types of exercises in *Discovering Computers* have evolved from 2000 to 2023. Over time, editions have increased the number of Key Terms, Checkpoint, and Chapter Review exercises, with 2023 showing the highest levels. Newer editions also include more diverse activities like Collaboration, Critical Thinking, and Learn It Online, reflecting a broader pedagogical approach. Figure 6 maps exercise types by Bloom's Taxonomy level. Earlier editions focused mainly on Remember and Understand, while recent editions, especially 2023, show a rise in higher-order skills such as Apply, Analyze, and Evaluate. This shift demonstrates a modest alignment with select 21st Century Skills, particularly digital literacy and teamwork, as recent editions include more diverse exercises such as collaboration tasks and applied technology use. However, the emphasis on critical thinking and problem solving appears relatively stable across editions, suggesting room for further enhancement in future versions.

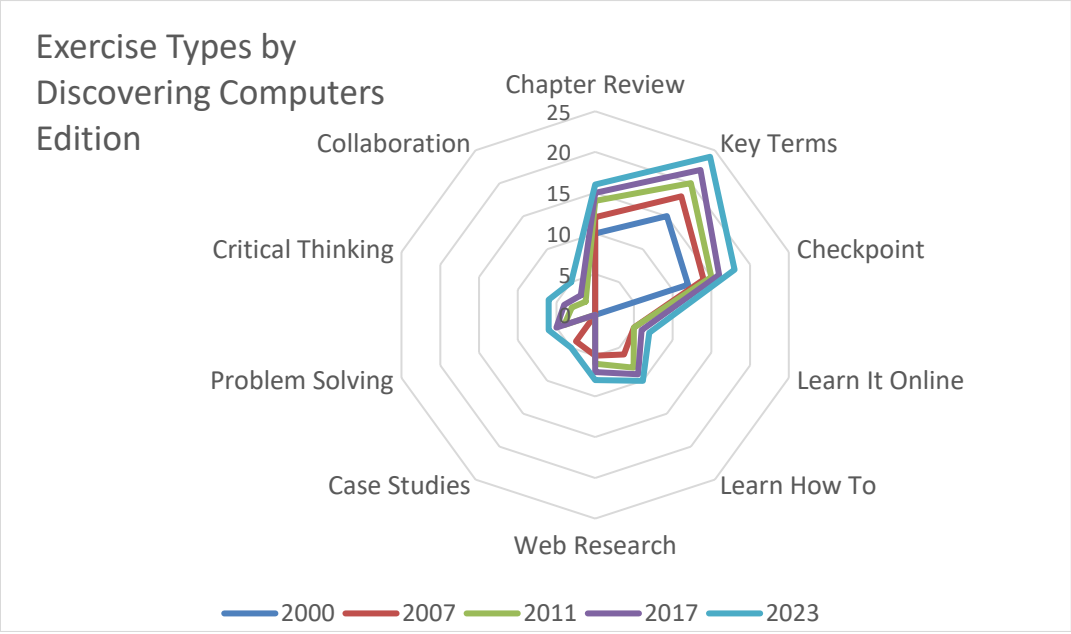

Figure 5: Exercise Types by *Discovering Computers* Edition

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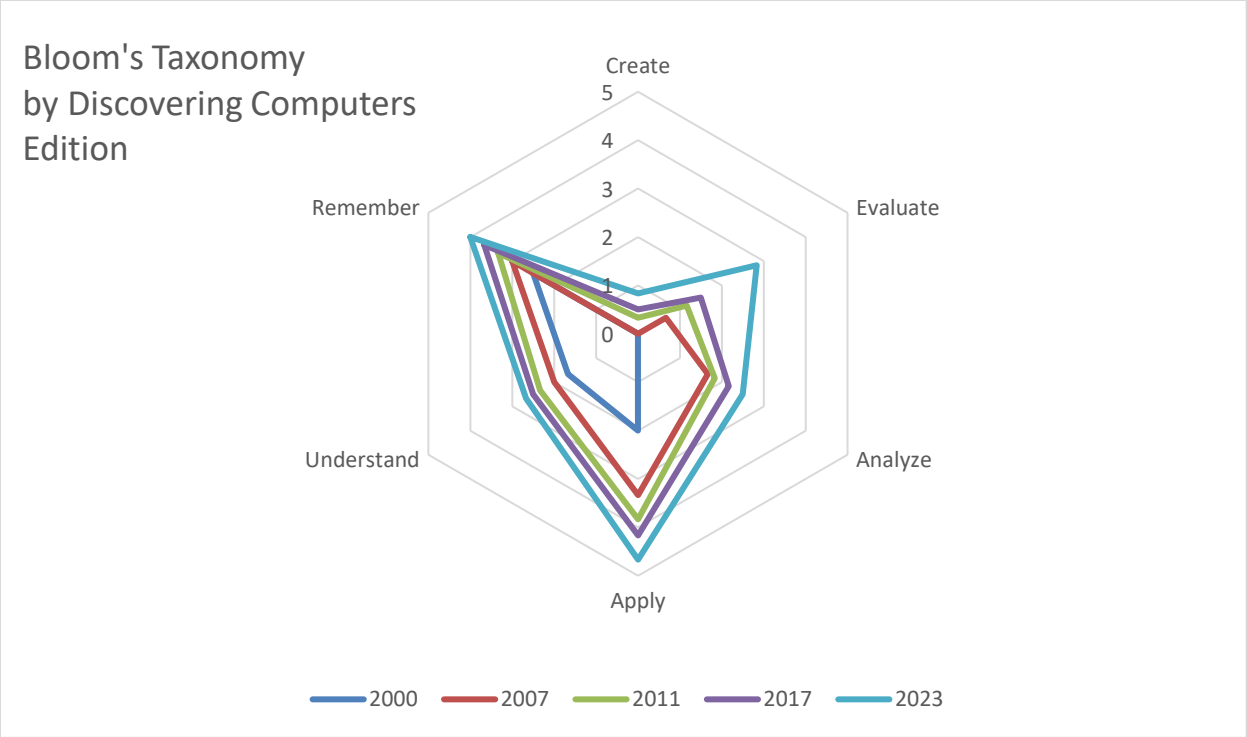

Figure 6: Bloom's Taxonomy by *Discovering Computers* Edition

The widespread availability of the Internet and web-based collaboration tools such as Google Docs in the mid- to late 2000s coincided with the introduction of new learning scenarios utilizing these technologies and encouraging educators to adapt teaching methods to better support 21st Century Skills.

7. DISCUSSION

While each data source provides a unique lens on the integration of 21st Century Skills, the most powerful insight comes from comparing them side by side. (See Table 9.) This triangulated view reveals not just individual shifts but broader alignment across engagement metrics, curriculum design, and instructional materials.

After examining NSSE surveys, model IS curricula, and an information systems textbook, this study concludes that 21st Century Skills have become increasingly central to computing education, although the extent to which they are integrated varies. NSSE data shows that while critical thinking, communication, and collaboration were already present in the 2000 survey, they were framed largely within the context of traditional academic engagement. By 2025, these same skills are reframed as competencies that can be applied across disciplines. Digital literacy experienced the greatest change, reflecting the increasing role of technology in personal and professional lives.

Skill	NSSE 2000 → 2025	Curricula 1997 → 2020	Textbook 2000 → 2023
Critical Thinking	↑ strong shift	↑ consistent increase	→ stable
Collaboration	↑ sharp increase	↑ strong increase	↑ added in later editions
Communication	↑ expanded contexts	↑ integrated explicitly	↑ evident in case studies/tasks
Creativity	↑ modest growth	↑ notably in 2010/2020	→ limited emphasis
Digital Literacy	↑ dramatically increased	↑ major focus across all	↑ very strong and growing

Table 9: Summary of Evolution of Four Cs and Digital Literacy across Student Engagement Surveys, Curricula, and IS Textbook approaches

Creativity remained minimally represented, especially in areas of assessment. Keeping in mind that the NSSE applies to all students (macro-level), these changes highlight that skills originally developed to support information systems majors have now been adopted as skills necessary for all students.

The same pattern is noted in the model IS curricula. IS 1997 and 2002 provide solid framework in technical foundations and problem solving with technology while creativity and collaboration are implied but have a much smaller presence. IS 2010 was the beginning of a shift to explicitly integrate essential skills such as ethical reasoning, teamwork and leadership. Finally, the competency-based model of IS 2020 aligns well with 21st Century Skills, emphasizing creativity, applying IT across multiple domains, and emerging demands for flexibility, innovation, and interdisciplinary collaboration. This progression shows a broader shift, positioning IS majors to move beyond technological expertise to play a more collaborative, strategic role across the organization.

The textbooks examined in this study mirror some of these shifts, especially in digital literacy and communication, but lag behind curricular guidelines and engagement surveys in promoting creativity, ethical reasoning, and entrepreneurship. Exercises are mixed in how they support higher order thinking and real-world problems. The evolution from exercises focusing on memorizing and recalling information to higher order thinking and problem solving align with revisions of information systems curricula and contemporary pedagogical approaches such as flipped classroom (Bergmann & Sams, 2014; Frydenberg, 2013; Thi Lan Huong et al., 2018) to foster critical thinking, analysis, and creativity.

Together, these findings suggest that computing education continues to strengthen its focus 21st Century Skills that prepare students for their future careers, with essential life skills beyond the Four Cs increasingly reflected as themes within current assessment surveys, curricula, and educational resources., though to varying extents. Critical thinking, collaboration, and communication are consistently emphasized, while creativity, ethical reasoning, and adaptability remain areas to watch for continued growth in future years.

These overlaps are important because they suggest that the growing emphasis on digital literacy and teamwork is not isolated to a single domain but reflected across student surveys, curricular mandates, and textbook practices. At the same time, the relative stagnation of creativity and critical thinking in some sources (particularly the textbook) highlights areas where further curricular innovation is needed.

8. CONCLUSION

This study set out to explore four guiding questions:

RQ 5. How are 21st Century Skills relevant to IS education?

Analysis shows that 21st Century Skills remain highly relevant to IS education. They provide a necessary framework for problem-solving, teamwork, adaptability, and digital competence in a rapidly evolving tech environment. These skills are increasingly reflected in standards and expectations for IS graduates.

RQ 6. How have model IS curricula and textbooks responded to technological change while promoting 21st Century Skills?

During the past quarter-century, model IS curricula have expanded their emphasis on 21st Century skills. Critical thinking, communication, and collaboration are consistently represented in foundational courses, while creativity and ethical reasoning are receiving growing attention. While textbooks have shifted from memorizing definitions toward more project-based learning, they have been slower to evolve, particularly in promoting creativity and critical thinking through assessment tasks.

RQ 7. Are 21st Century Skills still relevant 25 years later? What additional skills need to be included?

The relevance of 21st Century Skills is evident though their presence in assessments, technologies, and teaching methods. At the same time, ethical reasoning, empathy, and adaptability are emerging as *next-generation* competencies that expand on the original Four Cs.

RQ 8. What implications do these changes have for education and workforce development?

Rapidly evolving digital skills and next-generation competencies require educators to reconsider what they teach, how they teach it, and how they assess learning. A shift toward emphasizing process over product can encourage creative

problem solving, ethical judgment, and innovative thinking. For IS educators, this means aligning assignments, tools, and learning outcomes with skills required in the workplace.

Finally, to answer the question posed as the title of this paper, **Are 21st Century Skills Still Relevant in the 21st Century?**

21st Century Skills remain relevant in the 21st Century, but only if educators and institutions continue to evolve their meaning, expand their scope, and fully integrate them into goals and outcomes that shape the student learning experience.

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