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Evaluating the ICT C3 Curriculum in Maltese Schools: Teacher Perspectives

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Abstract: This study explores the implementation of the ICT C3 curriculum within Maltese schools, focusing on teacher perspectives across state, church, and independent sectors. Using a mixed-methods approach, data was gathered through questionnaires and focus group discussions, involving 112 ICT teachers. The research assesses teacher confidence, curriculum delivery, and resource adequacy, alongside challenges related to student engagement and assessment practices. Findings reveal that while educators generally feel confident in delivering the curriculum, gaps in infrastructure, professional development, and differentiated content persist. Significant concerns include the complexity of certain topics for younger students, the misalignment between the curriculum and real-world applications, and the need for improved resources, particularly in non-state schools. Additionally, the study highlights the need for clearer distinctions between ICT C3 and related subjects such as Computing and VET IT. Teachers advocate for curriculum refinement, increased professional development, and greater teacher involvement in curriculum design. The study concludes with recommendations to enhance teaching effectiveness and student preparedness in the evolving digital landscape, emphasising the importance of ongoing curriculum updates, targeted professional training, and improved resource allocation to meet the needs of both students and educators.

Keywords: ICT Curriculum, Teacher Perceptions, Digital Literacy, Curriculum Evaluation

Introduction

In today's digital age, Information and Communication Technology (ICT) is essential to modern education, equipping students with the skills needed to navigate and contribute to a technology-driven world. ICT education supports

students in developing critical competencies, such as digital literacy (DL), computational thinking (CT), problem-solving, and ethical awareness—skills that are fundamental for personal, academic, and professional success (UNESCO, 2018; OECD, 2015). Recognising these needs, educational systems worldwide have incorporated ICT and DL as core elements of curricula, ensuring that all students acquire a foundational entitlement to digital literacy. In secondary schools in Malta, this entitlement is expressed through the ICT C3 curriculum, a structured programme designed to progressively build students' digital skills for effective and responsible participation in society.

The ICT C3 curriculum spans five years, introducing students from Year 7 to Year 11 (ages 11-16) to both foundational and advanced digital competencies. Unlike traditional ICT syllabi that primarily emphasise software proficiency, the ICT C3 curriculum adopts a holistic approach. Its content includes CT, digital citizenship, coding, and exposure to emerging technologies such as artificial intelligence (AI) and blockchain. By encompassing such a wide range of topics, the curriculum aims to foster both practical skills and critical awareness, preparing students for potential ICT-related careers as well as for digital engagement in daily life.

Despite its comprehensive design, the effective delivery of the ICT C3 curriculum hinges on teachers' perceptions, readiness, and experiences. Teachers' confidence, their approach to curriculum content, and their access to adequate resources significantly influence its success in the classroom. Prior research has shown that successful ICT integration in schools is affected by factors such as teacher training, curriculum relevance to real-world applications, and the availability of supportive infrastructure (Tran & Stoilescu, 2016; Herbert et al., 2014). For Maltese educators, implementing an ICT curriculum that fosters essential 21st-century skills while addressing student needs presents both opportunities and challenges.

This study seeks to understand teachers' perspectives on the ICT C3 curriculum, focusing on its perceived strengths and challenges, as well as potential improvements to support effective implementation. By examining teachers' insights, this research aims to identify strategies to strengthen the curriculum, address gaps in training and resources, and enhance teaching practices to better prepare students for a dynamic digital landscape.

Literature Review

General Role of ICT in Education

The integration of ICT in education has transformed global educational practices. ICT serves not only as a support tool for traditional learning but as a crucial enabler for developing key 21st-century skills. In diverse educational contexts, frameworks such as those in Australia, Vietnam, and Tasmania have

shown both progress and challenges in embedding ICT into the curriculum (Tran & Stoilescu, 2016; Herbert et al., 2014). For instance, the development of the Tasmanian ICT curriculum emphasised a balanced approach, integrating industry-relevant skills with foundational competencies to produce graduates equipped for evolving ICT roles. This approach underscores that, while CT and DL are integral, practical, hands-on application is essential to ensure that students not only acquire skills but are also prepared for real-world demands (Herbert et al., 2014).These skills include critical thinking, problem-solving, DL, and collaboration, which are crucial for students in a technology-driven society.

According to UNESCO (2018), ICT can help transform the nature of education by facilitating new pedagogical approaches that focus on learner-centred, collaborative, and creative learning. This shift from traditional, teacher-centred instruction to a more dynamic, inquiry-based approach allows students to engage deeply with content, fostering critical thinking. ICT tools enable learners to interact with real-world problems, thus enhancing their problem-solving skills through simulated environments, data analysis, and interactive content (OECD, 2015). In this context, students are not only passive recipients of information but active participants in the learning process.

DL is another critical aspect of ICT integration in education. UNESCO (2018) emphasises that DL encompasses the skills and knowledge necessary for learners to effectively navigate and engage in a digital world. This goes beyond basic technical skills and includes understanding the ethical implications of technology use, such as data privacy and responsible online behaviour. OECD's (2015) report similarly highlights that students need to be equipped with DL to participate effectively in society and the workforce. This skill is particularly important in a world where technology plays an increasingly significant role in shaping societal dynamics. As noted in the *European Framework for the Digital Competence of Educators*, digital competence involves more than technical proficiency; it requires the ability to think critically and creatively about the ethical and social impacts of digital technologies in learning and life (Redecker & Punie, 2017).

Collaboration, another key 21st-century skill, is greatly enhanced by ICT. Through online platforms, students can collaborate with peers across geographic boundaries, sharing ideas and working on joint projects. This aligns with OECD's (2015) assertion that ICT provides opportunities for students to collaborate in ways that extend beyond the physical classroom, fostering social and teamwork skills. Such collaborative opportunities prepare students to function effectively in a globalised workforce, where teamwork and communication are essential.

ICT Curriculum Design and Pedagogy

Designing an ICT curriculum presents unique challenges, requiring a balance between teaching practical skills—such as software literacy and coding—and theoretical knowledge, including CT and digital citizenship. Studies on curriculum design, such as the Tasmanian ICT programme, highlight the importance of a structured development process that incorporates both technical and cognitive competencies, aimed at producing graduates ready for various ICT career pathways (Herbert et al., 2014). This approach aligns with Dagienė et al. (2021), who argue that an Informatics curriculum should cultivate technical proficiency alongside critical thinking and problem-solving skills, fostering adaptability and innovation among learners. The integration of hands-on, context-driven tasks, as seen in the Tasmanian curriculum, further supports engagement and retention of complex concepts (Herbert et al., 2014).

Practical skills, such as coding and software literacy, are essential in developing problem-solving abilities. As students learn programming, they engage in logical thinking and structured problem-solving processes, skills that are transferable across disciplines (Csizmadia *et al.*, 2015). At primary level, it is believed that coding should not be taught in isolation but integrated with other subjects and real-world applications (Mannila, 2023). This approach ensures that students see the broader relevance of these skills and are better equipped to use them in future endeavours.

CT, as highlighted by Wing (2006), is a fundamental skill for everyone, not just for computer scientists. It involves approaching problems in systematic ways, breaking them down into manageable components, and developing algorithms to solve them. This mode of thinking is essential not only in ICT but also in other areas of the curriculum, making it a cornerstone of modern education. This view is supported by the promotion of integrating CT across various subjects, which encourages interdisciplinary learning and enhances critical problem-solving skills (Csizmadia et al., 2015).

As students engage more with digital tools, they are called to understand the ethical and societal implications of their actions in the online space. Digital citizenship involves teaching students to navigate the digital world responsibly, ensuring they are aware of issues such as data privacy, online safety, and respectful digital behaviour (Jones & Mitchell, 2016). By embedding these concepts into the ICT curriculum, educators can help students become not just skilled technology users but also responsible digital citizens who are able to protect personal data and privacy in digital environments, manage risks and use digital technologies safely and responsibly (Redecker & Punie, 2017).

Progression in ICT learning is also critical. The ISTE Standards for Students (2016) outline a framework that supports the development of ICT skills from elementary through secondary education. In the early years, students might

focus on foundational skills, such as digital literacy and basic coding, while later years introduce more complex concepts, such as data analysis, algorithm design, and ethical issues surrounding technology use. This progression ensures that students not only build their technical skills but also their critical thinking and problem-solving capabilities as they advance through their education (ISTE, 2016).

Pedagogically, ICT education requires a shift from traditional didactic methods to interactive, student-centred approaches, as noted by OECD (2015). Inquiry-based learning, which encourages students to use ICT tools in solving real-world problems, has shown to enhance engagement and promote deep learning. This approach is further supported by the Tasmanian curriculum model, where integrating industry-relevant examples and collaborative projects was a central component in developing students' practical and theoretical understanding of ICT (Herbert et al., 2014). Such project-based, hands-on experiences help bridge the gap between academic learning and workplace expectations, a need increasingly recognised across global ICT curricula (Herbert et al., 2014; OECD, 2015). Furthermore, ensuring equity in access to technology is crucial. UNESCO (2018) stresses that inclusive and equitable access to ICT is essential in ensuring that all students can benefit from the opportunities that technology offers. Bridging the digital divide is vital to providing all learners, regardless of their socioeconomic background, with the tools and skills necessary to succeed in a technology-driven society.

ICT Competency Frameworks

Globally recognised ICT competency frameworks provide critical guidance in designing and implementing K-12 educational programmes, ensuring students develop the necessary digital skills to succeed in a rapidly evolving digital world. Among the most influential frameworks are the ISTE Standards for Students, the Digital Competence Framework for Citizens (DigComp), and the European Schools' Digital Competence Framework (DCF). These frameworks emphasise the development of digital literacy, collaboration, and problem-solving, equipping students with competencies that align with modern educational and professional demands.

The **ISTE Standards for Students** are designed to empower students to thrive in a digital age. These standards, established by the International Society for Technology in Education, focus on creating empowered learners who actively engage with technology to set and achieve learning goals. Key elements include the development of digital citizenship, where students are expected to manage their online identities responsibly and contribute positively to digital communities. Furthermore, students are encouraged to become computational thinkers, utilising technological methods such as data analysis and algorithmic thinking to solve complex problems. These standards are critical for curriculum development, as they emphasise not only the use of digital tools

but also the need to cultivate creativity, critical thinking, and collaborative problem-solving skills, which are central to 21st-century learning (ISTE, 2024).

The *DigComp 2.2 framework,* developed by the European Commission, serves as a comprehensive reference for digital competence in educational settings. DigComp outlines five key areas: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving. This framework highlights the importance of enabling learners to interact critically with digital technologies, including the ability to navigate, curate, and evaluate digital content effectively. Additionally, DigComp emphasises the ethical dimensions of digital interaction, such as protecting personal data and engaging in responsible online behaviour. Notably, the framework also addresses the need for digital competence to be adaptable to emerging technologies such as AI, ensuring that students are prepared for future challenges in digital environments (Vuorikari, Kluzer, & Punie, 2022).

The *Digital Competence Framework for the European Schools (DCF)* draws heavily from DigComp but adapts its principles to meet the needs of learners across European schools. Structured around the same five key areas as DigComp, the DCF is tailored to different educational cycles, from nursery to secondary school, with the goal of progressively developing students' digital skills. The framework's holistic approach emphasises cross-curricular integration, where digital competence is not confined to specific ICT lessons but is incorporated throughout various subjects. This cross-curricular model ensures that students apply digital skills in diverse contexts, fostering a more comprehensive and practical understanding of digital technologies. Additionally, the DCF emphasises the long-term and transdisciplinary nature of digital competence development, promoting individualised learning pathways for students as they advance through the education system (Schola Europaea, 2020).

Description of the ICT C3 Curriculum

The ICT C3 curriculum is designed to equip students from Year 7 to Year 11 (ages 11-16) with essential digital skills and knowledge, preparing them for the demands of the 21st century. Spanning five years, the programme focuses on fostering creativity, critical thinking, problem-solving, and technological proficiency through a blend of theoretical and practical learning. Topics range from basic computer literacy and coding to advanced concepts such as 3D modelling, video editing, blockchain, AI, and data science. The curriculum aims to develop responsible digital citizens, encouraging ethical use of technology while providing a strong foundation for future academic and professional endeavours in ICT.

The curriculum starts in Year 7 by introducing fundamental computer skills and basic concepts such as file management, word processing, and an overview

of computer systems. Students also begin learning the basics of coding through robotics, which builds teamwork and problem-solving abilities. In Year 8, the focus shifts toward CT and creative projects. Students learn how computers classify and process objects, explore game development through visual programming languages like Scratch™, and create simple animations. The Internet of Things (IoT) is introduced to help students understand how technology interacts with everyday life, encouraging curiosity about future digital developments. Year 9 introduces more technical and ethical dimensions. Students explore different operating systems and their environments. They gain practical experience in video editing and web development, adhering to copyright laws and ethical considerations. The ethical implications of social media and digital crimes are also discussed, promoting awareness of the impact of technology on society. In Year 10, students focus on specialised digital skills such as 3D modelling, sound editing, and data processing. Using various tools they create digital models and manipulate audio, while spreadsheet applications are used for data analysis. Topics like the digital divide are also explored, encouraging students to think critically about global access to technology. The final year, Year 11, introduces advanced digital technologies and tools, preparing students for future academic or professional pursuits in ICT. Students engage in image editing, manipulate blockchain technology concepts, and explore the fundamentals of AI, including machine learning and data science. This year provides an overview of cutting-edge technologies and equips students with advanced digital skills.

Throughout the ICT C3 curriculum, video content plays an integral role in the self-study component, supporting students' independent learning and enhancing classroom instruction. For each module, students are provided with access to video resources which address both technical skills and theoretical concepts, allowing students to review and reinforce their understanding at their own pace.

The ICT C3 curriculum is assessed continuously through coursework completed over the five years, with each year including a dedicated coursework component. In addition to this, students sit for a summative multiple-choice exam at the end of every year. Together, these coursework tasks and exams contribute to the final qualification.

Rationale of the study

The ICT C3 curriculum has been in place for five years, with the first cohort of students, who began in the academic year 2018/19, completing the full curriculum and sitting for their exam in 2023. With this initial cycle now concluded, it presents an ideal opportunity to assess the curriculum's implementation from a teacher's perspective. Teachers play a critical role in the success of any educational program, and understanding their experiences and

achievements is crucial for further enhancement. This study is driven by the following research questions:

- What are the strengths and weaknesses of the ICT C3 curriculum, as perceived by teachers
- What areas for improvement are identified by teachers to enhance the program's future implementation?

Methodology

This study employed a mixed-methods approach, combining quantitative and qualitative data collection to capture a comprehensive understanding of teachers' perspectives on the ICT C3 curriculum in Malta. This approach facilitated data triangulation, enhancing the validity and reliability of the findings by integrating multiple viewpoints.

Participant Recruitment and Sampling Methods

Participants were recruited using purposive sampling to target all ICT C3 teachers across the State, Church, and Independent educational sectors in Malta, aiming for a comprehensive representation of educators involved in delivering the ICT C3 curriculum. An online questionnaire comprising 26 open- and closed-ended questions was disseminated to these teachers through a gatekeeper—a designated official within the educational authorities coordinating communication related to the ICT C3 curriculum with schools and teachers. Utilising the gatekeeper ensured that the questionnaire reached all relevant teachers while adhering to institutional communication protocols. Within the questionnaire, participants were invited to express their interest in participating in a follow-up focus group discussion. Those who opted in were subsequently contacted and invited to attend an online focus group session. This approach facilitated the recruitment of participants willing to elaborate further on their experiences, thereby enriching the qualitative data set.

Data Collection Procedures and Instruments

The primary data collection instruments were an online questionnaire and a focus group discussion.

Questionnaire: The questionnaire was designed to explore teachers' experiences and perceptions of the ICT C3 curriculum. It collected demographic information such as gender, age, teaching experience, qualifications, and the educational sector of employment. The questionnaire included closed-ended questions using Likert scales to assess teachers' views on the usefulness of training, teaching methodologies employed, and the availability of resources and infrastructure. Open-ended questions allowed teachers to elaborate on the strengths and weaknesses of the curriculum, suggest areas for improvement, and comment on specific curricular components. The questionnaire was distributed electronically, using a secure online survey platform, and was

piloted with a small group of ICT teachers prior to full deployment to ensure clarity, relevance, and ease of completion.

Focus Group Discussion: Teachers who indicated willingness to participate in further discussions were invited to an online focus group session conducted via a secure video conferencing platform. A semi-structured interview guide was developed, comprising open-ended questions that delved deeper into themes identified from the questionnaire responses. Topics explored included detailed experiences with specific curriculum components, perceived challenges in curriculum implementation, suggestions for enhancing curriculum content and teaching practices, reflections on student engagement and learning outcomes, and insights into resource availability and infrastructural support. The focus group was facilitated by the researcher, lasted approximately 60 minutes, and was audio-recorded with participants' consent to ensure accurate transcription and analysis.

Ethical Considerations

Ethical approval for the study was obtained from the Faculty of Education Research Ethics Committee at the University of Malta (EDUC-2023-00505), ensuring adherence to ethical guidelines for research involving human participants. Participants were provided with an information sheet explaining the study's purpose, procedures, their rights, and how the data would be used. Consent was obtained electronically before participants commenced the questionnaire, and additional verbal consent was obtained at the start of the focus group session, particularly regarding the recording of the discussion.

Confidentiality and anonymity were maintained by anonymising all participant data. Personal identifiers were removed during data transcription, and pseudonyms or codes were used in reporting findings to protect participants' identities. Participation was entirely voluntary, and participants were informed that they could withdraw from the study at any point without consequences or the need to provide a reason. Data were stored securely on password-protected devices and encrypted storage solutions, with access restricted to the researcher and supervisory team. Data handling complied with the General Data Protection Regulation (GDPR) and local data protection laws. The study was designed to minimise any potential discomfort or distress, with questions formulated sensitively, and participants not required to answer any questions they were uncomfortable with.

Data Analysis

The analysis was conducted through both statistical and thematic approaches to ensure a comprehensive understanding of the data collected.

Quantitative Data Analysis: The quantitative data from the closed-ended questionnaire responses were analysed using statistical software, specifically

Python libraries such as Pandas and NumPy (McKinney, 2010). Descriptive statistics, including frequencies, percentages, and means, were computed to identify patterns and trends in teachers' perceptions of the ICT C3 curriculum's implementation, training efficacy, teaching methodologies, and infrastructural support. Inferential statistical tests, such as correlation analysis using Pearson's correlation coefficient, were conducted to examine relationships between variables like years of teaching experience, prior experience with the ECDL curriculum, and perceptions of the ICT C3 curriculum's relevance. Statistical significance was evaluated using p-values with a threshold of 0.05, providing deeper insights into the data and allowing for a more nuanced understanding of the factors influencing teachers' perceptions.

Qualitative Data Analysis: Qualitative data from the open-ended questionnaire responses and the focus group discussion were analysed using thematic analysis (Braun & Clarke, 2006). The analysis involved familiarisation with the data through transcription and repeated reading, followed by coding to identify significant features relevant to the research questions. Codes were collated into potential themes, which were reviewed and refined to ensure they accurately represented the data. Themes were defined and named, and the analysis was written up by selecting compelling examples and relating findings back to the research questions and literature. This systematic approach ensured that the analysis was thorough and that the findings accurately represented the participants' perspectives.

Trustworthiness and Rigour

To enhance the trustworthiness of the qualitative findings, several strategies were employed. Data triangulation was achieved by combining data from questionnaires and focus group discussions to cross-validate findings. The researchers maintained a reflective journal to acknowledge personal biases and preconceptions that might influence the analysis, promoting reflexivity. Providing detailed accounts of the contexts and participants' experiences allowed readers to determine the transferability of the findings through thick description.

Results

Participant Demographics and Background

The study's sample comprised 112 teachers from the State, Church, and Independent educational sectors in Malta who completed the online questionnaire. Among these participants, 58% (65) were female and 42% (47) were male. The age distribution revealed that the largest group of participants fell within the 40–49 age range (34.8%, 39), followed by those aged 30–39 (3

1.3%, 35), 50–59 (17.9%, 20), and 20–29 (13.4%, 15). Additionally, two participants were over 60 years old, and one was under 20.Employment across

educational sectors showed that 52.7% (59) of the participants were employed in the State sector, 38.4% (43) in the Church sector, and 8.9% (10) in the Independent sector. This distribution reflects a broad representation of various school colleges within the State sector and other educational institutions in Malta.

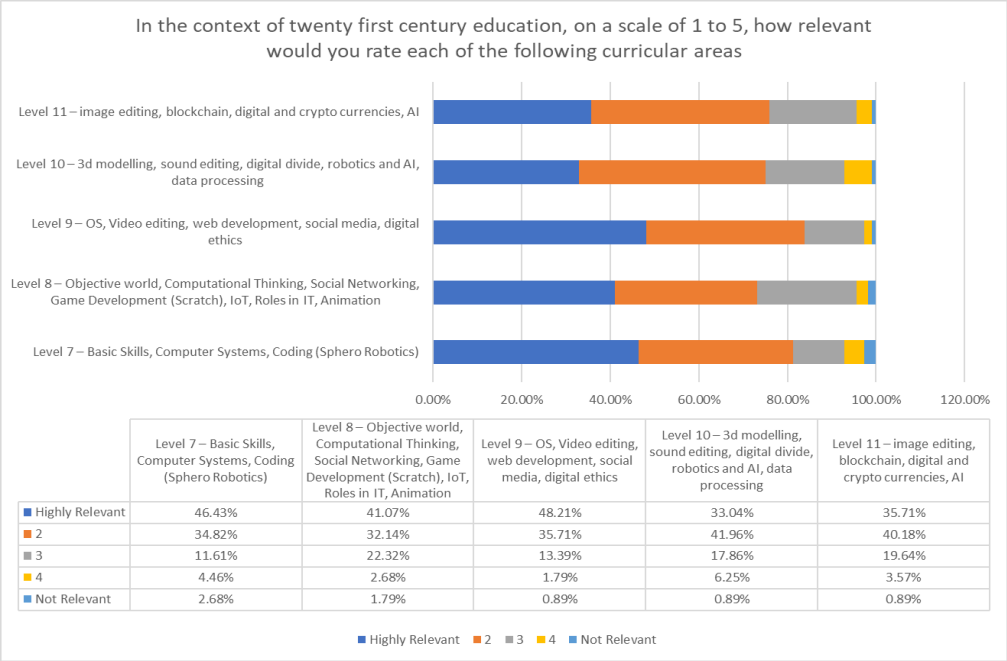
Participants' teaching experience varied widely, offering a diverse range of perspectives on the ICT C3 curriculum. A significant portion, 23.2% (26), had over 21 years of teaching experience, indicating a wealth of educational expertise within the sample. Conversely, only 1.8% (2) had less than one year of experience. Other experience levels included 20.0% (23) with 1 to 3 years, 16.0% (18) with 11 to 15 years, 15.2% (17) with 7 to 10 years, 14.3% (16) with 16 to 20 years, and 8.9% (10) with 4 to 6 years of teaching experience.

In terms of qualifications, 17.0% (19) of the participants lacked a formal teaching qualification. Of those with formal qualifications, 47.3% (53) held qualifications specifically in Computing, while 35.7% (40) were teaching ICT C3 curriculum with qualifications in other fields. Notably, a substantial majority, 83.0% (93), had prior experience teaching European Computer Driving Licence (ECDL) classes, indicating familiarity with structured ICT content.

Regarding their roles within the ICT C3 curriculum, most teachers were responsible for specific year levels rather than teaching the entire five-year curriculum. This specialisation allowed teachers to focus on particular age groups and curriculum content but may have limited their holistic understanding of the curriculum's progression and overall structure.

21st Century Skills

In evaluating the relevance of various curricular areas in the context of 21st century education, teachers expressed varying levels of agreement on the significance of these topics. Most notably, there is a recurring concern regarding the adequacy of preparation in essential digital skills, such as keyboard use and the introduction of AI tools at earlier stages in the curriculum. However, some teachers also pointed out challenges in understanding complex subjects like blockchain, suggesting that the curriculum may need to be adjusted to better suit students' learning stages. These insights underscore the need for a curriculum that effectively aligns with the practical demands of contemporary education, ensuring students are equipped with the necessary skills for the future. The teachers were also asked about the relevance of the different curricular areas in the context of 21st century skills. As **figure 4.2.1 below** shows Level 9 was deemed to be marginally the most relevant.



	Level 7 – Basic Skills, Computer Systems, Coding (Sphero Robotics)	Level 8 – Objective world, Computational Thinking, Social Networking, Game Development (Scratch), IoT, Roles in IT, Animation	Level 9 – OS, Video editing, web development, social media, digital ethics	Level 10 – 3d modelling, sound editing, digital divide, robotics and AI, data processing	Level 11 – image editing, blockchain, digital and crypto currencies, AI
Highly Relevant	46.43%	41.07%	48.21%	33.04%	35.71%
2	34.82%	32.14%	35.71%	41.96%	40.18%
3	11.61%	22.32%	13.39%	17.86%	19.64%
4	4.46%	2.68%	1.79%	6.25%	3.57%
Not Relevant	2.68%	1.79%	0.89%	0.89%	0.89%

Figure 4.2.1 – In the context of 21st century education, on a scale of 1 to 5, how relevant would you rate each of the following curricular areas.

Computational Thinking

CT is a cornerstone of the ICT C3 curriculum, representing a critical skill set that students must develop to navigate the increasingly complex digital world. As highlighted in the curriculum overview, the ICT C3 curriculum is designed to build foundational digital competencies, with CT playing a central role, particularly in Year 8. To assess the effectiveness of this component, the questionnaire administered to teachers included specific questions aimed at understanding their familiarity with CT, their confidence in teaching its various elements, and their perceptions of its representation within the curriculum.

As shown in Figure 4.3.1 below, results indicate that a substantial majority, 87.5% (98) of respondents have a clear understanding of CT, while 12.5% (14) do not. This suggests a relatively high level of familiarity with the concept among educators, which includes essential problem-solving skills and algorithmic reasoning necessary for success in the digital landscape.

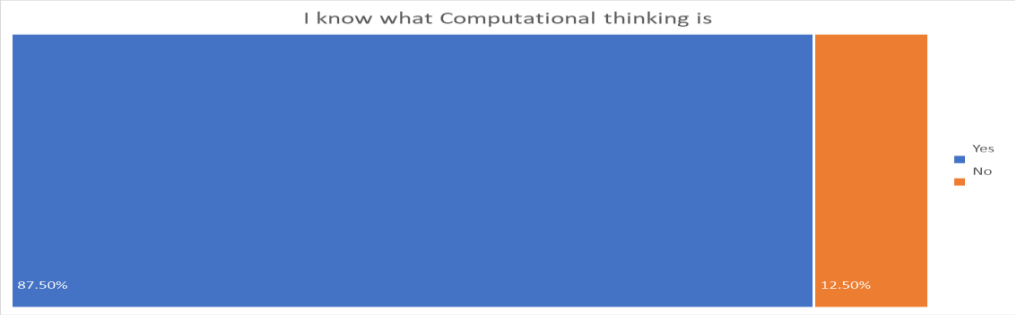


Figure 4.3.1 – I know what Computational thinking is

Further data reveal varying levels of confidence among educators in teaching the different aspects of Computational Thinking. As shown in Figure 4.3.2 below, a small minority rated their confidence as very low and low, 6.1% (6) and 12.3% (12) respectively. On the other hand, a notable 30.6% (30) indicated a moderate level of confidence. Additionally, 32.7% (32) of respondents expressed relatively high confidence, and 18.4% (18) reported strong confidence. These results suggest that a significant portion of educators feel adequately prepared to teach CT elements within the ICT C3 curriculum.

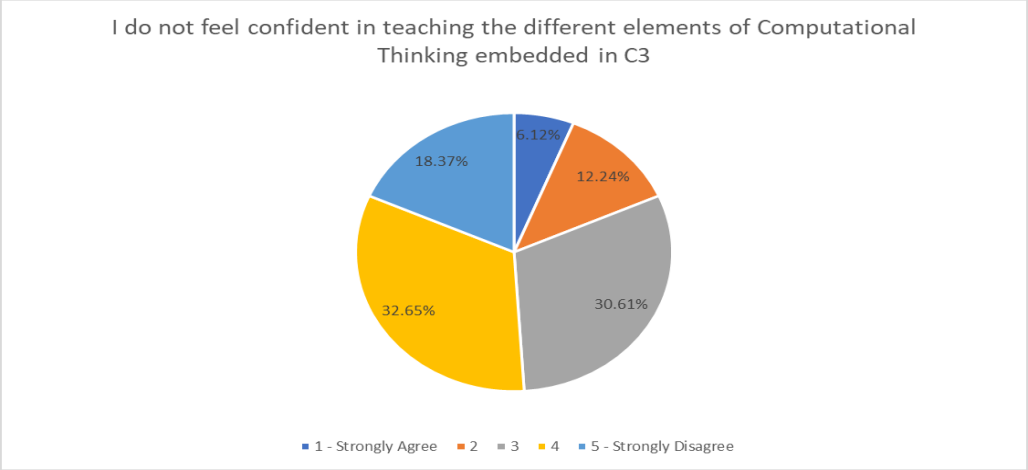


Figure 4.3.2 – I do not feel confident in teaching different elements of Computational Thinking embedded in ICT C3 curriculum.

As illustrated in Figure 4.3.4, responses reveal diverse opinions regarding the representation of CT within the ICT C3 curriculum. A small minority feel that CT is not adequately represented in the curriculum, 11.2% (11) and 4.1% (4). A considerable percentage of respondents 55% (54) believe that it is moderately represented, while the remaining, 3.1% (3) and 26.5% (26) agree and strongly agree respectively that CT is well represented.

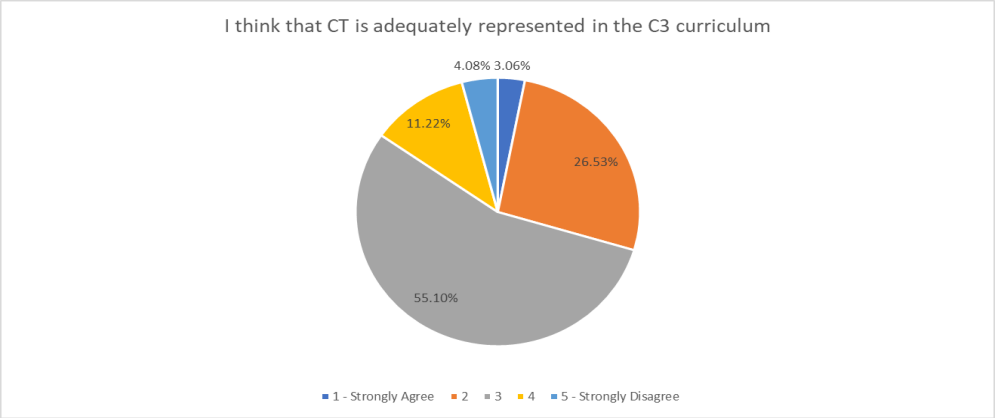


Figure 4.3.4 – I think that CT is adequately represented in the ICT C3 curriculum.

Educators were asked to elaborate on the representation of CT in the ICT C3 curriculum. The responses highlight several concerns. Some educators point to the abstract nature of CT, noting a lack of practical application, clear examples, and sufficient time for in-depth exploration within the curriculum. Others cite challenges such as the limited scope of CT coverage, insufficient guidance in problem-solving, and the absence of feedback mechanisms that address different learning styles. Additionally, some educators emphasise the need for greater contextualisation, increased student engagement and motivation, and stronger connections between CT concepts and students' everyday lives. They also stress the importance of providing opportunities for independent learning and exploration. Overall, while CT is acknowledged as an important component of the curriculum, there is a consensus that enhancements are necessary to achieve a more comprehensive and effective representation.

Complimenting Computing and VET IT

One of the key objectives in designing the C3 curriculum was to bridge the gap between the Computing and VET IT syllabi. To evaluate this, teachers were asked whether they felt that the ICT C3 curriculum encouraged students to choose Computing and/or VET IT as elective subjects. Additionally, they were asked to assess whether they believed the ICT C3 curricullum effectively complemented both the Computing and VET IT syllabi.

As shown in Figure 4.4.1 below, out of 47 respondents who teach both Computing and ICT C3, 53.2% (25) believe that the ICT C3 curriculum does in fact play a part in encouraging students to choose Computing as an option subject in Year 9. Conversely, 46.8% (22) believed otherwise. These results suggest a relatively balanced perception among educators regarding the impact of the ICT C3 curriculum on students' inclination towards pursuing Computing as an option.

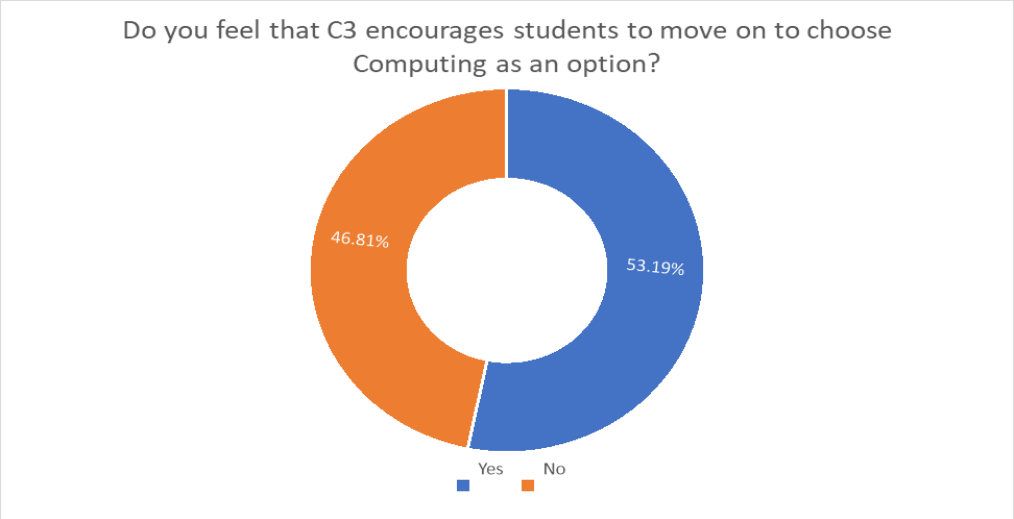


Figure 4.4.1 – Do you feel that the ICT C3 curriculum encourages students to move on to choose Computing as an option?

To justify their replies, the respondents who believed that the ICT C3 curriculum does encourage students to choose Computing, mention the introduction to Coding and CT at an early age as positive incentives. On the other hand, others thought that the ICT C3 curriculum caused students to bear misconceptions about Computing, which eventually led them away from Computing. Furthermore, while the ICT C3 curriculum provided a foundational understanding of IT skills relevant to daily life for most students, this did not necessarily translate to a desire to pursue Computing as a subject.

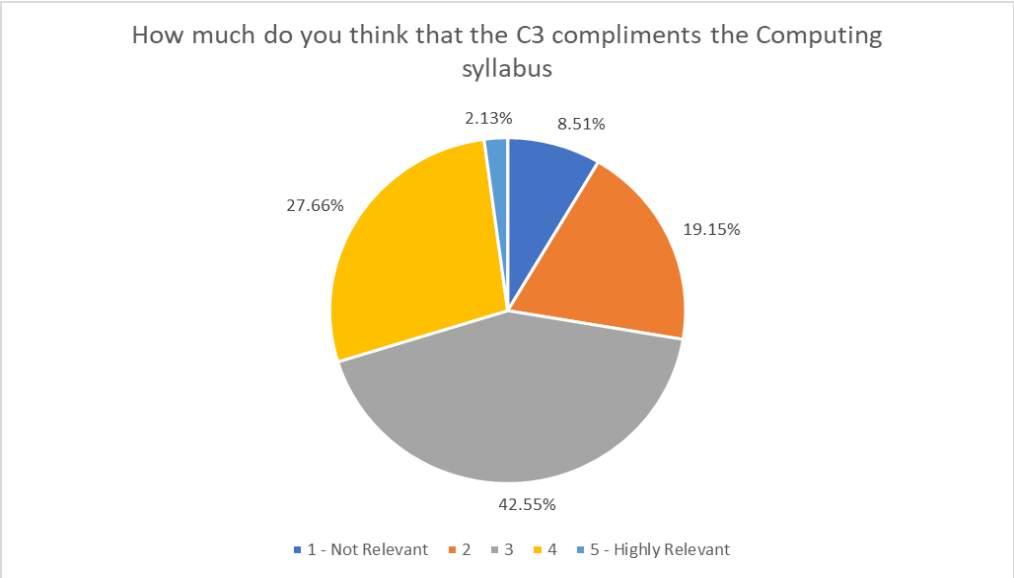


Figure 4.4.2 – How much do you think that the ICT C3 curriculum compliments the Computing syllabus.

As shown in Figure 4.4.2 below the teachers were asked to rate how much they believed that the ICT C3 curriculum compliments the Computing syllabus. Only a small minority of respondents (8.5%, 4) rated the complementarity as very low, assigning a score of 1, while 19.1% (9) considered it somewhat low, rating it as 2. In contrast, a significant portion of 42.6% (20) perceived moderate complementarity, assigning a score of 3, and 27.7% (13) viewed it as somewhat high, rating it as 4. Only a small fraction of 2.1% (1) regarded the complementarity as very high, giving it a score of 5.

As illustrated in Figure 4.4.3 below, among the 13 respondents who answered the question on whether the ICT C3 curriculum encourages students to select VET IT as an option, 38.5% (5) felt that the curriculum does indeed contribute to motivating students towards VET IT, while 61.5% (8) disagreed. These results suggest a mixed perception among educators, with a slight majority feeling that the ICT C3 curriculum does not significantly influence students' decisions to pursue VET IT as a subject.

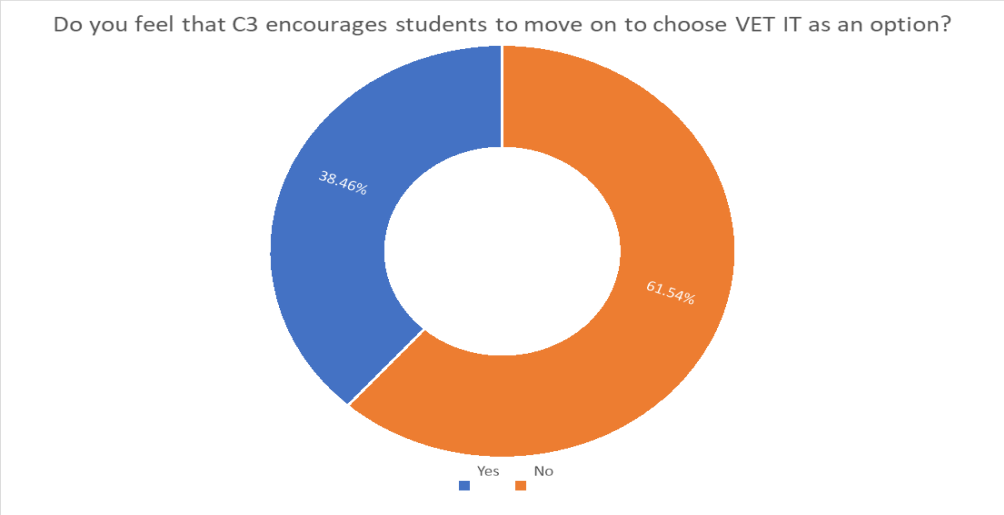


Figure 4.4.3 – Do you feel that ICT C3 curriculum encourages students to move on to choose VET IT as an option?

Those who believed that the ICT C3 curriculum encourages students to choose VET IT highlighted its role in providing an early introduction to IT concepts, which can spark interest in the subject. However, the majority of respondents who felt otherwise pointed out that students often do not see the direct relevance of the ICT C3 curriculum to the VET IT pathway, and by the time students are making subject choices, their interests might have diverged from VET IT.

When asked to rate how much they believed the ICT C3 curriculum complements the VET IT syllabus , the responses were varied as shown in Figure 4.4.4 below. A majority of respondents (53.8%, 7) rated the

complementarity as moderate. Meanwhile, 23.1% (3) rated it as very low , 15.4% (2) rated it somewhat low , and 7.7% (1) rated it as somewhat high. This distribution indicates a perception that while the ICT C3 curriculum provides some foundational support, its alignment with the VET IT syllabus is generally seen as moderate at best.

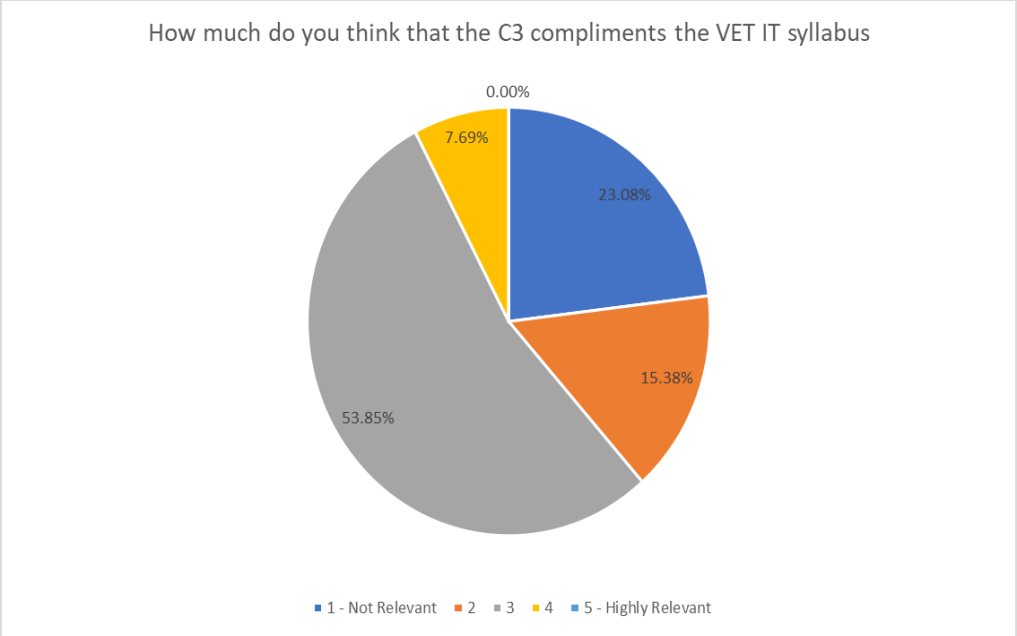


Figure 4.4.4 – How much do you think that the ICT C3 curriculum compliments the VET IT syllabus.

Topic Relevance

To gain deeper insights into the relevance and effectiveness of the ICT C3 curriculum according to the teachers, the questionnaire focused on three key areas: identifying the five most relevant topics within the curriculum, pinpointing five topics that could be removed, and suggesting any essential topics that are currently missing.

When considering the relevance of topics within the ICT C3 curriculum based on both knowledge and teaching experience, as shown in Table 4.5.1 below, respondents identified Basic Skills as the most pertinent. In second place is Video Editing, emphasising its significance in cultivating multimedia literacy and communication skills. Following closely, Coding and Social Media were equally valued, reflecting the growing need for technological fluency and digital citizenship in today's interconnected world. The topics of Robotics and AI, IoT, Image Editing, Web Development and Digital Ethics were rated very closely. In the focus group, teachers expressed concerns about the appropriateness of coursework involving animation and coding for Year 7 and Year 8 students, suggesting these tasks might be more suitable for older students in Year 9 due to the cognitive demands and developmental readiness

required. They also noted that some topics might be too detailed or advanced for students at the ICT C3 level, emphasising that certain theory-based topics, even when supported by video content, failed to engage students effectively. This feedback underscores the need for a more graduated introduction of complex topics within the curriculum and highlights the importance of aligning the curriculum with students' developmental stages and interests to maintain engagement and ensure content relevance.

Entry	Count	Percentage
Basic Skills	74	13.21%
Video Editing	45	8.04%
Social Media	36	6.43%
Coding	36	6.43%
Robotics and Artificial Intelligence	34	6.07%
Internet of Things	32	5.71%
Image Editing	31	5.54%
Web Development	31	5.54%
Digital Ethics	29	5.18%
Game Development	24	4.29%
Data Processing	23	4.11%
Intro to Artifical Intelligence	22	3.93%
Computational Thinking	22	3.93%
Social Networking	19	3.39%
Computer Systems	17	3.04%
3D Modelling	16	2.86%
Animation	15	2.68%
Sound Editing	14	2.50%
Operating Systems	10	1.79%
Intro to Digital and Cryptocurrencies	8	1.43%
Roles of IT	7	1.25%
Intro to Blockchain	7	1.25%
Digital Divide	5	0.89%
The Objective World	3	0.54%

Table 4.5.1 – Based on your knowledge and teaching experience of the ICT C3 curriculum, choose 5 topics you feel are the most relevant.

In contrast, as shown in Table 4.5.2 below, respondents expressed clear preferences for topics they would consider removing from the curriculum. Topping the list was “Introduction to Blockchain,” indicating it as a subject they would eliminate. “Introduction to Digital and Cryptocurrencies” and “The Objective World” were equally agreed upon as topics that should be removed. Additionally, “Roles of IT” was also mentioned by participants as a topic to consider removing. These responses suggest a desire to streamline the curriculum by focusing on what the teachers perceive as more relevant and

practical subjects that better align with students' learning needs. Opinions on the inclusion of Operating Systems (OS) in the curriculum varied within the focus group. While some participants advocated for its removal, others suggested a more streamlined approach, avoiding deep dives into technical aspects like kernels. This diversity of perspectives underscores the need for curriculum designers to balance essential knowledge with avoiding unnecessary complexity, particularly in areas where the relevance may be perceived as limited. The focus group also reflected a range of views on other topics, such as Intro to Blockchain, Roles of IT, Digital Divide, and The Objective World, which some teachers perceiving them as less relevant. A common sentiment was the need to reassess the relevance and depth of coverage for these topics, with particular debate over the inclusion of Blockchain, where some questioned the practical benefits for students. This suggests a desire for the curriculum to focus more on practical applications and tangible outcomes, especially when introducing emerging technologies like Blockchain.

Entry	Count	Percentage
Intro to Blockchain	37	10.63%
The Objective World	32	9.20%
Intro to Digital and Cryptocurrencies	32	9.20%
Roles of IT	28	8.05%
None	27	7.76%
Sound Editing	16	4.60%
Computational Thinking	16	4.60%
Animation	16	4.60%
3D Modelling	15	4.31%
Digital Ethics	14	4.02%
Digital Divide	13	3.74%
Operating Systems	12	3.45%
Web Development	10	2.87%
Game Development	10	2.87%
Computer Systems	10	2.87%
Robotics and Artificial Intelligence	8	2.30%
Internet of Things	8	2.30%
Intro to Artificial Intelligence	8	2.30%
Coding	7	2.01%
Data Processing	7	2.01%
Social Media	7	2.01%
Image Editing	6	1.72%
Video Editing	4	1.15%
Social Networking	4	1.15%
Basic Skills	1	0.29%

Table 4.5.2 – Based on your knowledge and teaching experience of the ICT C3 curriculum, which 5 topics would you definitely remove?

In considering the scope of topics relevant to modern education, several teachers expressed the need for the inclusion of subjects currently absent from the ICT C3 curriculum. There is a notable emphasis on the integration of digital skills, particularly in the early introduction of AI and a more comprehensive teaching of office applications. Some teachers also pointed out that while there might be relevant topics not included, the current curriculum already demands substantial teacher and student engagement, making additional content challenging to implement.

To further assess the impact of the ICT C3 curriculum compared to its predecessor, the ECDL syllabus, respondents were asked to rate the perceived relevance of the ICT C3 curriculum in relation to the ECDL. Additionally, they were invited to reflect on whether any essential skills from the ECDL syllabus were excluded from the new ICT C3 curriculum.

As shown in Figure 4.5.1 below, respondents offered varying opinions on the relevance of the ICT C3 curriculum compared to the previous ECDL syllabus. The vast majority, 60.7% (68), agree that the ICT C3 curriculum is more relevant, while 22.3% (25) disagree.

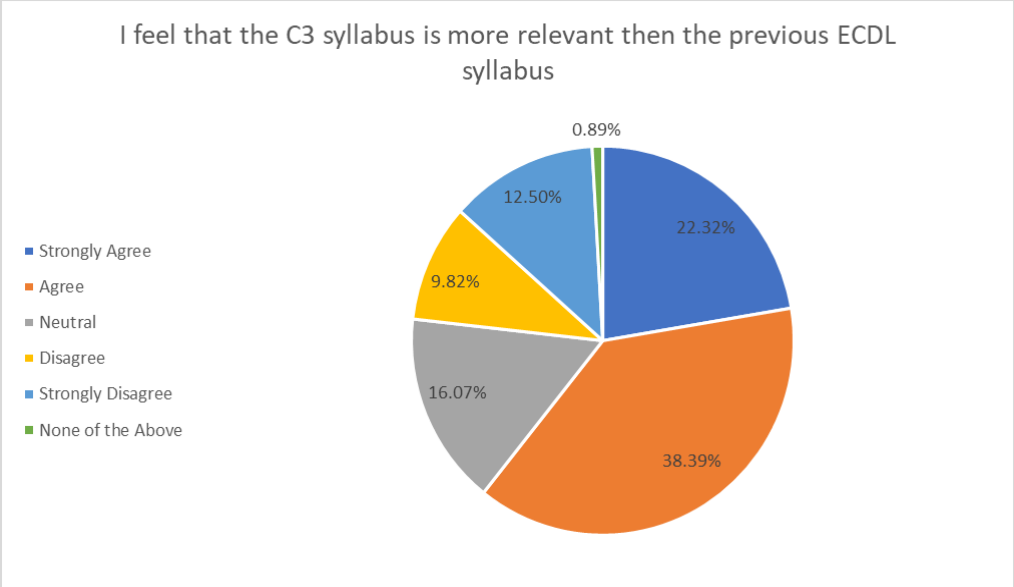


Figure 4.5.1 – I feel that the ICT C3 curriculum is more relevant then the previous ECDL syllabus.

In spite of the above, as shown in Figure 4.5.2 below, the majority of respondents (75.9%, 85) believe that relevant skills from the ECDL syllabus have not been fully carried over into the ICT C3 curriculum. This indicates a

perceived gap in the updated syllabus, with many educators feeling that certain valuable competencies were left behind in the transition. This should be seen in the light of data from other questions, where teachers emphasised the importance of topics revolving around basic office skills. Conversely, 17% (19) disagree with this sentiment, believing that the ICT C3 curriculum adequately covers all essential skills. A smaller subset of respondents, 7.1% (8), indicated they had not taught the ECDL syllabus before, suggesting a lack of familiarity with the specific content of the previous curriculum.

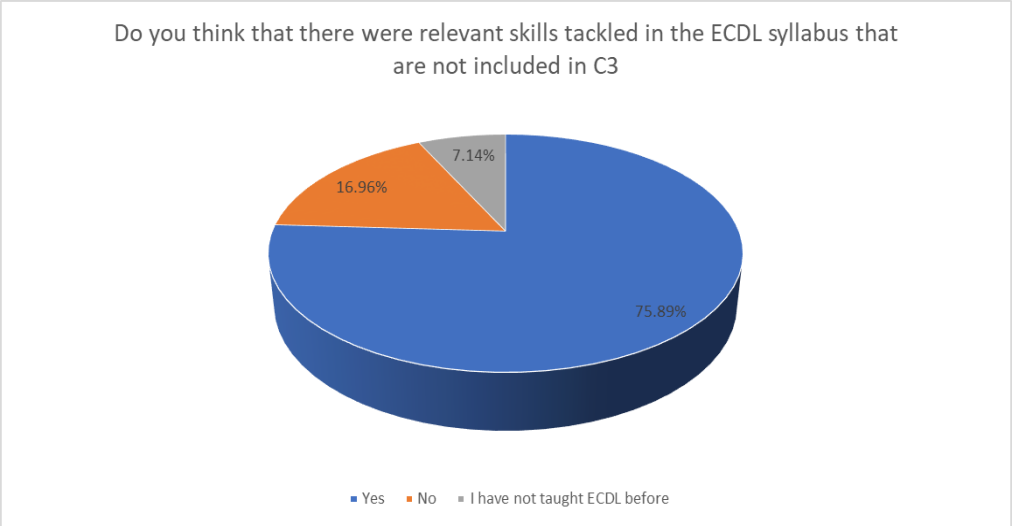


Figure 4.5.2 – Do you think that there were relevant skills tackled in the ECDL syllabus that are not included in ICT C3 curriculum?

Recognising the importance of understanding how past teaching experiences might influence teachers' perceptions of new curriculum updates, we conducted a correlation analysis to examine the relationship between these factors. The analysis reveals a negligible correlation between participants' prior experience teaching the ECDL syllabus and their views on the relevance of the ICT C3 curriculum, with correlation coefficients of 0.04 and 0.03, respectively. The p-values of 0.7300 and 0.8079 suggest that these relationships are statistically insignificant, likely occurring by chance rather than reflecting a meaningful connection. Additionally, while there is a moderate correlation (0.59) between the number of years participants taught ECDL and whether they taught it before the introduction of the ICT C3 curriculum, this finding does not translate into a significant impact on their perception of the ICT C3 curriculum's relevance. Overall, these results indicate that prior teaching experience with ECDL has little to no bearing on educators' views of the updated ICT C3 curriculum.

Teacher's views on improving the ICT C3 curriculum

In an open-ended question continuing on the previous question "If you could change ONE thing about the ICT C3 curriculum, what would it be and why?",

many express a desire for more manageable class sizes, particularly in Year 8, where teaching a full class can be overwhelming, leading to challenges in effectively managing coursework and addressing individual student needs. Some educators suggest reducing the breadth of topics covered or revising the order of coursework to better suit students' cognitive abilities and interests. Concerns are also raised about the relevance and effectiveness of certain topics, such as blockchain and cryptocurrency, and the need for more practical, hands-on learning experiences.

Furthermore, there's a call for enhancements in instructional materials, including self-study videos, which some students find tedious or difficult to engage with. Suggestions include introducing interactive elements, providing clearer explanations, and incorporating more engaging content. Additionally, there's a consensus on the need for more class time dedicated to exploring topics in depth, fostering collaboration among students, and promoting critical thinking skills through assignments or projects. Overall, educators emphasise the importance of refining the curriculum to better meet the diverse needs and learning styles of students while ensuring relevance and effectiveness in preparing them for the digital world.

Discussion

The findings of this study shed light on the successes and limitations of the ICT C3 curriculum from the perspectives of Maltese ICT educators. This section situates these findings within the broader discourse on ICT in education, drawing on relevant literature to highlight key insights and suggest pathways for curriculum enhancement.

Strengths and Weaknesses of the C3 Curriculum

The ICT C3 curriculum's shift from traditional software literacy toward foundational 21st century digital competencies is generally well-received by teachers. This aligns with Çapuk's (2015) work, where ICT serves as both a subject of study and a medium through which students can explore and interact with knowledge in other domains. Similarly, in Turkey, the F@tih project aimed to bridge the gap in technological integration, underscoring the importance of a balanced approach that combines infrastructure with practical ICT skill development (Aydın et al., 2016). This integrative model resonates with teachers' positive views on CT's role within the curriculum, as it prepares students to apply their learning across disciplines. Similar curriculum frameworks, such as that developed by the University of Tasmania, demonstrate that effective ICT education requires balancing technical skills with complementary soft skills to develop well-rounded graduates (Herbert, et al., 2014). This balanced approach is key in preparing students for diverse roles in modern economies. However, as Tran and Stoilescu (2016) note, practical application is essential to student engagement, a concern that some Maltese

educators share. Incorporating more industry-relevant examples could help bridge the gap between theoretical knowledge and real-world skills in the ICT C3 curriculum. A significant majority of respondents (87.5%) demonstrated a clear understanding of CT, underscoring its importance. This skill has become an essential part of digital literacy in countries like Australia and Vietnam, where it prepares students for complex problem-solving tasks needed in modern economies (Tran & Stoilescu, 2016). However, some teachers (15.3%) felt that it is underrepresented in practical applications, indicating a gap between theoretical understanding and hands-on engagement within the curriculum.

While the curriculum aligns well with contemporary needs, certain weaknesses were noted. Specifically, teachers highlighted challenges with more abstract topics, such as blockchain and cryptocurrency, which some find too complex and difficult for students to grasp. Similar challenges are noted in studies of ICT curricula in Portugal, where educators emphasise the need for more context-based, application-driven learning experiences to make abstract topics accessible to younger learners (Costa et al., 2012). Integrating more real-world examples and hands-on activities could enhance engagement with these complex concepts, better aligning the curriculum with students' developmental stages and reinforcing its relevance in contemporary education.

Additionally, teachers pointed out gaps in essential digital skills, including foundational competencies like keyboard use, which are critical for students as they engage with technology in various academic and professional contexts. More importantly, teachers also identified the introduction of AI at earlier educational stages as a significant gap. A report from the U.S. Department of Education emphasises the urgency of implementing AI in education, as AI is expected to play a significant role in personalised and adaptive learning environments. This report highlights the need for students to acquire both AI-specific knowledge and broader digital skills from a young age to ensure they are ready for a technology-centred workforce (U.S. Department of Education, 2023).

Areas for Improvement in the ICT C3 Curriculum

Several key areas for improvement emerged from this study, particularly regarding the depth and sequencing of topics. Teachers suggested that subjects like coding and animation might be more appropriate for older students, aligning with findings from Weber and Greiff (2003) that early exposure to complex ICT concepts can overwhelm younger students. This challenge reflects broader issues seen in other ICT curriculum developments, such as the Tasmanian curriculum, where balancing industry-relevant technical skills with student readiness was a focal point of design (Herbert, et al., 2014). In Turkey, findings on the F@tih project highlight similar issues, where developmental appropriateness in content sequencing was identified as critical to effective ICT

integration (Aydın et al., 2016). Adjusting topic progression and integrating practical applications, as implemented in Tasmania, may enhance students' developmental readiness and engagement with the ICT C3 curriculum. Incorporating a structured progression model, such as that observed in the Portuguese ICT Learning Outcomes Framework, could ensure that each topic is introduced at an age-appropriate stage, fostering deeper comprehension and skill development (Costa et al., 2012). These findings highlight the importance of a flexible curriculum that better aligns with students' cognitive development.

The most notable area for improvement is the inclusion of more practical, hands-on learning experiences, particularly in CT, which is currently perceived as too theoretical. Teachers also called for improved instructional materials, such as interactive videos and clearer explanations, to better engage students and accommodate different learning styles. Additionally, the issue of class size, particularly in Year 8, was a recurring theme, with educators highlighting the challenges of managing larger groups effectively, especially in topics that require individual attention.

Another key opportunity for refinement lies in improving the alignment between the ICT C3 curriculum and related IT subjects like Computing and VET IT. While approximately 53% of teachers believe the ICT C3 curriculum encourages students to pursue Computing, others remain unconvinced, suggesting that the curriculum's potential to guide students toward elective subjects is not fully realised. A more integrated approach that builds on foundational competencies in ICT C3 curriculum and transitions smoothly into specialised subjects could enhance the perceived value of each pathway, strengthening students' educational experiences across the ICT spectrum. Additionally, the ICT C3 curriculum's emphasis on digital citizenship aligns with global trends but could be further expanded. Studies on ICT integration in Australia and Vietnam found that ethical technology use, including data privacy and online safety, is increasingly critical in preparing students for responsible digital participation (Tran & Stoilescu, 2016). Ensuring that digital citizenship is robustly addressed within the C3 curriculum could establish it as a comprehensive pathway for cultivating informed and responsible digital citizens.

The study also underscores the importance of ongoing curriculum refinement to better align with technological advancements and effectively prepare students for the digital world (see section 4.4). In particular, clearer differentiation and guidance between the ICT C3, Computing, and VET IT syllabi are needed to help students make more informed decisions regarding their educational and career pathways. Teachers highlighted concerns that the current structure of the ICT C3 curriculum may not sufficiently distinguish itself from Computing, which could lead to confusion among students. By

addressing this need, the curriculum could mitigate challenges related to coursework complexity and engagement, ensuring students have a more solid understanding of the differences and similarities between ICT C3 and other IT-related subjects.

Moreover, the spectrum of opinions regarding the alignment and synergy between the ICT C3 and Computing curricula suggests potential areas for further integration. Enhancing the coherence between these programmes could provide students with a more unified and comprehensive digital education. For instance, refining how CT and other foundational IT concepts are introduced could help bridge the gap between introductory digital competencies in ICT C3 and more advanced topics in Computing and VET IT. Such efforts would not only support students in navigating the progression from ICT C3 to Computing or VET IT but also strengthen the overall digital education strategy, ensuring that students receive a more cohesive learning experience across subjects.

Recommendations for Curriculum Enhancement

Based on these findings, several recommendations emerge for enhancing the ICT C3 curriculum. Firstly, increased emphasis on practical, hands-on learning experiences is essential, particularly in areas like CT and digital citizenship. Drawing on the Tasmanian curriculum's development approach, integrating practical applications was shown to increase student engagement and retention by making abstract concepts more accessible and context-driven (Herbert, et al., 2014). This aligns with Costa et al. (2012), who argue that ICT competencies are best developed through engaging, real-world examples. Furthermore, strengthening teacher training to support this practical shift and provide structured professional development would empower educators to deliver the ICT C3 curriculum effectively, echoing the focus on industry-relevant skills observed in other ICT curricula.

Furthermore, strengthening teacher training and professional development is critical to effective curriculum delivery. Educators in the current study expressed concerns about large class sizes and the challenges of individualising instruction, echoing findings from both Australia and Vietnam, where adequate time and professional development opportunities were highlighted as essential for teachers to fully integrate ICT into their teaching practices (Tran & Stoilescu, 2016). Similarly, Belgium's ICT policy planning framework underscored the importance of distributed leadership and collaborative planning in supporting teachers' capacity to implement ICT curricula effectively (Vanderlinde et al., 2012). Providing structured, context-specific professional development programs could empower teachers to deliver the ICT C3 curriculum with confidence and adaptability.

Lastly, the study underscores the importance of continuous curriculum updates to maintain relevance in a rapidly changing digital landscape. The curriculum's inclusion of topics like AI and blockchain is commendable, but as Costa et al., (2012) note, staying responsive to technological advancements requires a dynamic approach to curriculum design that reflects emerging digital trends without overwhelming students. By iterating on the current ICT C3 framework to include flexible content updates and a more age-appropriate progression model, Maltese schools can ensure that the ICT C3 curriculum remains a cornerstone of 21st-century education in Malta.

Conclusion

This study aimed to explore teachers' perspectives on the ICT C3 curriculum in Malta, focusing on its perceived strengths, weaknesses, and areas for improvement to enhance future implementation. By employing a mixed-methods approach, the research gathered quantitative and qualitative data from 112 ICT educators across various educational sectors, providing a comprehensive understanding of the curriculum's impact from those directly involved in its delivery.

The findings indicate that the ICT C3 curriculum's shift towards foundational 21st century digital competencies is generally well-received. Teachers appreciate the emphasis on critical skills such as CT, digital literacy, and ethical awareness, aligning with global educational trends that stress the importance of preparing students for a technology-driven society (UNESCO, 2018; OECD, 2015). The inclusion of topics like AI and blockchain reflects a forward-thinking approach, aiming to equip students with knowledge relevant to emerging technologies.

However, several challenges emerged. Teachers highlighted difficulties with certain abstract or complex topics, such as blockchain and cryptocurrency, which may be too advanced for the students' developmental stages. Additionally, gaps were identified in essential digital skills, including basic keyboard proficiency and the early introduction of AI concepts. The need for more practical, hands-on learning experiences was emphasised, particularly in teaching CT, to bridge the gap between theoretical knowledge and real-world application.

An important insight from the study is the recognition of the need to introduce CT and DL at the primary and early years of education. Early exposure to these foundational skills is crucial in developing students' problem-solving abilities, logical reasoning, and understanding of the digital world (Wing, 2006; Csizmadia et al., 2015). By integrating CT into the curriculum from a young age, educators can foster a generation of learners who are not only consumers

of technology but also creators and critical thinkers capable of navigating complex digital landscapes.

Implementing CT and DL in the early years also aligns with international educational frameworks that advocate for progressive skill development (ISTE, 2016; Mannila, 2023). Early introduction ensures that students build a strong foundation, making advanced topics more accessible and less daunting as they progress through their education. This approach can enhance engagement, confidence, and competence in ICT, ultimately contributing to better preparedness for future academic and professional pursuits.

Based on these insights, several recommendations emerge for enhancing the ICT C3 curriculum and the broader educational strategy:

Curriculum Integration in Early Education: Develop and implement a structured curriculum for CT and DL at the primary and early years. This initiative should focus on age-appropriate activities that introduce key concepts through play-based and inquiry-driven learning.

Curriculum Refinement: Adjust the depth and sequencing of topics within the ICT C3 curriculum to ensure age-appropriateness and better alignment with students' cognitive development. Complex subjects could be introduced progressively, building on the foundational skills acquired in earlier years.

Emphasis on Practical Application: Incorporate more hands-on, context-driven learning experiences to make abstract concepts tangible. This approach can increase student engagement and facilitate deeper understanding.

Teacher Training and Support: Provide structured professional development programmes for educators at all levels, equipping them with the necessary skills and resources to deliver CT and DL content effectively. Enhanced training can address confidence gaps and promote innovative teaching methodologies.

Curriculum Alignment: Improve the coherence between the ICT C3 curriculum and related subjects like Computing and VET IT. Clearer differentiation and guidance can help students navigate their options and foster a more integrated digital education strategy.

Continuous Curriculum Update: Establish mechanisms for regular curriculum review and updates to keep pace with technological advancements and evolving educational needs, ensuring relevance from the early years through secondary education.

Limitations and Future Research

The study's findings are based on self-reported data from teachers, which may be subject to biases or limitations in perspective. Additionally, the research focused on educators within Malta, and while the insights are valuable, they may not be generalisable to other contexts without considering local educational structures and cultural factors.

Future research could expand to include student perspectives on the ICT curriculum across different educational stages to gain a holistic understanding of its impact. Investigating the effectiveness of early introduction of CT and DL on students' long-term academic performance and interest in ICT-related fields could also provide deeper insights. Comparative studies with educational systems in other countries could also offer valuable lessons and inform best practices for curriculum development.

Final Remarks

The ICT C3 curriculum represents a significant step towards modernising ICT education in Malta, aiming to equip students with essential skills for the 21st century. However, this study highlights the critical importance of starting CT and DL education in the primary and early years. By doing so, educators can build a robust foundation that supports students' ongoing learning and adaptation to a rapidly evolving digital world.

Addressing the challenges identified and implementing the recommended enhancements can better fulfil the curriculum's objectives. Engaging educators in ongoing dialogue about curriculum development ensures that teaching practices evolve in tandem with technological advancements. Ultimately, a comprehensive and progressive approach to ICT education—from early childhood through secondary education—will prepare students to thrive in an increasingly digital society.

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