



Digital citizenship and student-teacher readiness: insights from Malaysia

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Abstract

Introduction. Digital citizenship is increasingly recognised as vital for teacher education, yet its integration in Malaysia remains fragmented. This study investigates how digital citizenship is conceptualised, taught, and experienced in Malaysian Institutes of Teacher Education (ITEs).

Method. A convergent parallel mixed-methods design was adopted, combining a survey of 425 student-teachers across four ITE campuses, interviews with eight lecturers and document analysis of national education policies, UNDP Digital Transformation Framework and course summaries.

Analysis. Survey data were analysed descriptively, while interviews and documents were thematically coded using a hybrid deductive-inductive coding framework informed by Ribble's nine elements of digital citizenship. Triangulation across strands enabled identification of convergences and gaps.

Results. Student-teachers showed near-universal access to devices and high online activity but inconsistent verification practices, limited ethical reasoning and emotional reliance on digital connectivity. Lecturers displayed conceptual ambiguity and lacked training, while curricula reflected fragmented integration of digital citizenship.

Conclusion. The study identifies a policy-practice gap, highlighting the need for cross-curricular integration, dedicated modules, and lecturer training. It stresses digital well-being as a professional competency and situates Malaysia's case within global debates on preparing reflective, ethical, and participatory digital citizens for the 21st century.

Introduction

The growing digitalisation of education has fundamentally reshaped how citizenship is taught and experienced. Teachers today are expected not only to deliver knowledge but also to cultivate learners who can navigate misinformation, cyberbullying, privacy risks, and the psychological strains of hyper-connectivity. In this context, digital citizenship that includes responsible, ethical, and participatory engagement in digital environments has become a cornerstone of 21st century teacher education.

Globally, however, integration of digital citizenship in teacher education has been uneven and often superficial. Two recurring pitfalls dominate. First, the technocentric fallacy reduces digital citizenship to tool proficiency, online safety or procedural compliance. Second, isolationist pedagogy separates civic and digital content, undermining the holistic preparation needed for democratic and ethical participation. Although advanced systems such as Finland embed digital ethics and critical literacy across curricula, many contexts including Malaysia, struggle with fragmented delivery and depoliticised approaches.

Malaysia illustrates these tensions acutely. National frameworks such as the *Malaysia Education Blueprint (2013–2025)* and the *Digital Education Policy (2023)* highlight aspirations for technologically literate, globally competitive graduates. However, civic education traditions remain rooted in patriotism, obedience, and moral conduct, often marginalising critical reflection and participatory engagement. Policies invoke digital competence as an economic imperative but rarely articulate its civic or ethical dimensions. This ambiguity is consequential for teacher education, where ITE must prepare educators to be both digital role models and civic facilitators.

Empirical research on digital citizenship among teachers in Malaysia remains limited. To date, only one study has examined in-service teachers' knowledge, revealing that both teachers and students lacked a precise understanding of digital citizenship and its components and some of them demonstrated practical experience and ethical behaviour when using technology (Sulaiman et. al., 2025). Beyond this, research on both in-service and pre-service teachers is scarce. International studies further suggest that pre-service teachers are often unfamiliar with the concept of digital citizenship and may conflate it with digital competence, while critical aspects such as participatory and ethical reasoning are frequently overlooked. These gaps raise important questions about whether future teachers in Malaysia are adequately prepared to navigate the digital world and embed digital citizenship in schools.

This study addresses these gaps by investigating how digital citizenship is conceptualised and experienced in Malaysian teacher education through a triangulated, mixed-methods design: surveys of 425 student-teachers, interviews with eight lecturers, and document analysis of national education policies and curricula. Three research questions guide the study:

1. How do student-teachers perceive and engage with digital citizenship in their learning and daily practice?
2. How do lecturers understand and deliver digital citizenship content?
3. How do policies and curricula integrate digital citizenship themes?

By answering these questions, the study makes three contributions. Empirically, it offers, to our knowledge, one of the first multi-source, mixed-methods accounts of digital citizenship in Malaysian pre-service teacher education, while recognising that further validation across broader contexts is needed. Theoretically, it examines the applicability of global frameworks, Ribble's procedural model and Choi's participatory model, within a Southeast Asian civic educational context shaped by socio-political constraints. Practically, it identifies concrete strategies for

bridging policy-practice divides, including cross-curricular integration, toolkit development, explicit attention to elements of digital citizenship, and targeted lecturer development.

Through this lens, the paper argues that while Malaysian student-teachers are digitally immersed, their ethical reasoning and critical practices remain underdeveloped. Lecturers lack conceptual clarity and institutional support, and policy documents reinforce a technocentric and fragmented vision. These findings underscore the urgent need for institutional reform to prepare reflective, ethical, and resilient digital citizens in Malaysia's schools.

Literature review

Conceptual foundations of citizenship and digital citizenship

Citizenship education traditionally prepares individuals for civic life, encompassing rights, responsibilities and identity. In Malaysia, however, it has been largely framed through nation-building discourses, prioritising loyalty, patriotism, and moral obedience (Ahmad & Abdullah, 2022; Haniza, 2014; Kennedy, 2021). While this reflects cultural and political imperatives, it risks reducing citizenship to compliance rather than critical engagement, a limitation that becomes more problematic in digital contexts.

Digital citizenship expands the notion of civic participation to online spaces, requiring ethical, responsible, and participatory behaviours (Wulandari & Triyanto, 2021). Ribble's (2012) nine-element framework remains influential for its comprehensiveness but is criticised for its technocentric and procedural orientation, privileging compliance over empowerment (Choi, 2016). In response, Choi (2016) advanced a participatory model, stressing political expression, critical media consumption, and civic engagement. This study adopts Ribble's structured framework while integrating Choi's participatory emphasis, thereby capturing both normative and critical dimensions of digital citizenship. Recent work calls for hybrid models that combine technical fluency, ethical reasoning, and critical participation (Frau-Meigs et al., 2017). Yet, few frameworks adequately integrate digital well-being, now recognised as a crucial dimension of citizenship in the digital age.

Global trends in teacher education and digital citizenship

Internationally, teacher education reflects significant divergence in how digital citizenship is framed and delivered. In the United States, programmes often adopt rule-based, procedural emphasis on safety, plagiarism, and copyright (Choi et al., 2017). Similarly, studies in Turkey reveal that digital citizenship is frequently conceptualised in functional and literacy-related terms rather than participatory or civic ones (Avcı & Durak, 2022; Çoklar & Tatlı, 2020). While such models provide clarity and structure, they risk reinforcing the technocentric fallacy that technical proficiency and compliance alone constitute digital citizenship.

By contrast, Finland exemplifies a cross-curricular integration model, embedding digital ethics and civic engagement across subjects (Hujanen et. al., 2021). However, even in advanced systems, teachers report uncertainty when addressing political issues online, highlighting ongoing tensions between policy ideals and classroom practice. Similar trends are observed in South Korea, Singapore, and Hong Kong, where civic dimensions are frequently downplayed due to political sensitivities or policy constraints (Choi & Park, 2023; Leung & Ng, 2014; Zhang et. al., 2022).

Across contexts, two recurring pitfalls emerge: (1) the technocentric fallacy, reducing digital citizenship to IT proficiency, and (2) isolationist pedagogy, treating digital and civic education separately. Both limit teachers' capacity to prepare learners for complex digital societies.

Digital well-being as an emerging priority

A growing body of research positions digital well-being as central to digital citizenship, extending beyond access and literacy to the psychological and emotional dimensions of digital life. Studies

highlight youth vulnerabilities to anxiety, fear of missing out (FOMO), and dependency on constant connectivity (Bhattacharya et al., 2023; Livingstone et al., 2022), while Büchi (2024) stresses the societal need for digital balance. Yet, teacher education remains under-prepared: pre-service teachers are digitally immersed but often lack strategies to manage stress, maintain well-being, or model healthy practices (Datu et al., 2023). This gap marks a critical blind spot in frameworks that privilege technical and ethical competencies over emotional resilience.

Digital citizenship in Malaysian teacher education

Malaysia has articulated ambitious policy aspirations. The Malaysia Education Blueprint (2013–2025) and the Digital Education Policy (2023) both emphasise technological innovation, employability, and ethics. Yet, digital citizenship remains subsumed under instrumental discourses of skills and productivity, with little explicit curricular integration (Kamarudin et al., 2021; Rosli & Jamaludin, 2023). Civic education continues to privilege patriotism and obedience, reflecting longstanding political priorities (Haniza, 2014; Kennedy, 2021), while digital literacy is siloed within IT courses.

Empirical research on digital citizenship in Malaysia is scarce. One recent study of in-service teachers found both teachers and students demonstrated ethical technology use but lacked a clear conceptual grasp of digital citizenship (Sulaiman et al., 2025). International studies provide further insight, showing that teachers often adopt narrow interpretations, equating digital citizenship with plagiarism avoidance, IT competence, or online safety, while giving little attention to critical literacy or civic engagement (Rosli & Jamaludin, 2023). Evidence on pre-service teachers in Malaysia is almost non-existent, leaving their preparedness to engage and model digital citizenship underexplored.

Synthesis and research gaps

The literature highlights several unresolved issues. First, conceptual ambiguity persists: Ribble's compliance-oriented model dominates practice, while more critical, participatory frameworks remain underutilised. This study responds to this gap by adopting Ribble's Nine Elements as the guiding framework, complemented by Choi's participatory emphasis, to capture both normative and critical dimensions of digital citizenship. Second, despite global advances, most systems including Malaysia remain procedural and fragmented. They fail to integrate civic, ethical and well-being dimensions holistically. Third, while policy frameworks in Malaysia acknowledge digital skills, they provide little operational guidance for teacher education, perpetuating a gap between rhetoric and practice. Finally, pre-service teacher education is a major blind spot, with little empirical evidence on how student-teachers perceive and practise digital citizenship.

This study directly addresses these gaps by triangulating student-teacher survey data, lecturer interviews, and policy document analysis. In doing so, it situates Malaysian teacher education within global debates, advancing both theoretical refinement and practical recommendations for curriculum and professional development.

With the rapidly evolving digitalisation of education, teacher education faces heightened responsibility to prepare future educators for navigating online risks, fostering resilience, and cultivating ethical digital citizens. Addressing these challenges requires moving beyond compliance-oriented models toward more integrated and participatory approaches, an agenda this study directly engages.

Methodology

This study adopted a convergent parallel mixed-methods design (Creswell & Plano Clark, 2011), enabling quantitative and qualitative data to be collected concurrently, analysed separately, and integrated at the interpretation stage. This design was chosen to capture both the breadth of

student-teachers' digital citizenship practices and the depth of lecturers' perspectives and policy frameworks, ensuring triangulation across sources.

Participants. The quantitative strand comprised a survey of 425 student-teachers across four ITEs in the East Zone of Peninsular Malaysia, representing diverse academic majors and year levels. For the qualitative strand, eight lecturers were purposively sampled from IT and Moral Education courses, given their direct role in embedding citizenship and digital citizenship within the curriculum. Policy and curriculum documents including the Malaysia Education Blueprint (2013-2025), the Digital Education Policy (2023), the UNDP Digital Transformation Framework (2022-2025), and selected ITE syllabi were analysed to provide a macro-level perspective.

Instruments. The survey instrument combined original items with an adapted version of Al-Zahrani's (2015) REPs digital citizenship scale, revised to align with Ribble's framework and the Malaysian teacher education context. It included sections on (a) demographic information, (b) conceptual knowledge, (c) digital citizenship literacy, (d) ethical reasoning, and (e) lived experiences, with Likert-scale, dichotomous, and open questions. The survey was administered digitally via Qualtrics. Semi-structured interviews with lecturers followed an interview guide that balanced comparability with flexibility, allowing probing of conceptual ambiguities and pedagogical challenges.

Validity and reliability. Given that a large proportion of participants speak Malay, all instruments were translated from English into Malay. As a native Malay speaker, the researcher conducted the initial translation to ensure linguistic and conceptual accuracy. Following Mertens (2005), three Malay-speaking experts reviewed the translations for clarity, cultural appropriateness, and alignment with research objectives. Furthermore, these specialists evaluated the questionnaire and interview questions for content relevance, wording and construction (Mertens, 2005; Radakrishna, 2007), and revisions were made accordingly. Guidelines for clear and unambiguous question construction were strictly followed (Creswell, 2009).

Given the exploratory nature of this study, internal consistency measures (e.g., Cronbach's alpha) were not applied to the full instrument. As emphasised by Bryman (2012) and LeCompte & Schensul (2013), descriptive and exploratory research prioritise uncovering patterns and contextual insights rather than statistical generalisability. Reliability was instead addressed through methodological triangulation, expert validation, and careful adaptation and translation of items (Creswell & Plano Clark, 2011; Suárez-Álvarez et al., 2018). This approach ensured rigour while aligning with the study's mixed-methods, interpretive design.

Data analysis. Quantitative data were analysed using descriptive statistics (frequencies and percentages). Qualitative data from interviews, survey open responses, and documents were coded within a hybrid deductive-inductive framework, informed by literature, Ribble nine-elements and emergent themes. This process enabled systematic comparison between policy aspirations, lecturer practices and student-teachers' lived realities.

Ethics. Approval was obtained from the University of Glasgow (Ref. 100230068) and Malaysia's Ministry of Education (KPM.600-3/2/3 Jld 3 (76)). Participation was voluntary, with informed consent secured and anonymity preserved.

This methodological design ensured that findings were grounded in both structural policy analysis and lived educational practice, strengthening the study's credibility and relevance.

Findings

Student-teachers' perceptions and practices of digital citizenship (RQ1)

Survey responses from 425 student-teachers reveal a profile of high digital access and participation but underdeveloped critical, ethical, and civic dimensions of digital citizenship. The

results are presented across four domains: access and usage, information evaluation, ethical or legal awareness, and digital well-being, followed by an integrated analysis.

Indicator	% of Respondents
Smartphone ownership	99%
Laptop ownership	78%
Tablet ownership	65%
Daily internet use: 6–8 hours	34%
Daily internet use: >10 hours	21%
Primary use: education	57%
Primary use: communication/social media	33%

Table 1. Device ownership and internet usage patterns (n = 425)

Findings: Access is nearly universal, with smartphones dominating. Internet use is intensive, with more than half online for at least six hours daily. While education was cited as the primary purpose, social media remains a significant driver of engagement. This mirrors Malaysian youth’s strong digital immersion but also exposes vulnerabilities to distraction and misinformation.

Behaviour	Always/Often	Sometimes	Rarely/Never
Verifies accuracy before sharing (n=425)	57%	30%	13%
Finds searching for information difficult (n=425)	3%	21%	76%
Reports difficulty understanding online information (n=424)	40%	35%	25%

Table 2. Information verification and evaluation.

Findings: Although most students reported confidence in searching which is reflected in the 85% who stated that they rarely or never found searching difficult, only 57% consistently verified accuracy before sharing. At the same time, 40% admitted difficulty understanding digital information. This illustrates what Frau-Meigs et al. (2017) call the fluency–literacy gap where students are adept at navigating platforms but lack deeper evaluative and critical literacy skills. For future teachers, this gap risks transmitting uncritical practices to pupils.

Behaviour considered ‘Crime’	% Identifying as Crime
Creating Malware/spam	79%
Unauthorized account access	59%
Sharing unverified accusations	60%
Tagging negative tweets	20%
Persistent online questioning	15%
Criticising people with different view	25%
Taking part in online discussion but prefers to share detail opinion without having knowledge	21%

Table 3. Awareness of digital ethics and law (n=425).

Findings: Clarity was highest for overtly illegal behaviours (e.g., malware, hacking), but ambiguity persisted in ‘grey areas’ of online interaction. Less than half considered tagging negative tweets or persistent provocation problematic. This suggests reliance on procedural, rule-of-thumb understandings of digital law, with limited ethical reasoning for everyday online dilemmas.

Indicator	% of Respondents
Use internet to cope with unwanted feelings	82%
Experienced panic/distress when disconnected	77%
Feelings reported when disconnected	
- Loneliness	52%
- Depression	24%
- Restlessness	21%
- Panic	20%
- Normal	51%

Table 4. Emotional dependence and digital well-being (n=425).

Findings: A striking 82% reported using the internet to regulate unwanted emotions, while 77% experienced panic or distress when disconnected. The feelings listed above were predefined survey options: loneliness, depression, restlessness, panic, and normal, with an 'Other' field for participants to add additional responses. Participants could select more than one. No positive feelings were included, as the question specifically asked about emotions experienced when the internet is unavailable. Only 24% selected 'Normal' alone, while 51% selected it with one or more negative feelings, indicating that most respondents still experienced discomfort when disconnected.

Taken together, these results indicate a strong emotional reliance on connectivity, with disconnection commonly associated with loneliness, panic, and restlessness. This highlights digital well-being as an underdeveloped dimension of digital citizenship education. Current curricula emphasise safety and IT skills but rarely address balanced online-offline practices or resilience. This is an urgent issue as teachers model digital habits to students.

Dimension mentioned in open responses	Frequency
Safety and compliance (e.g., plagiarism avoidance, protecting data)	High
Respectful online behaviour	Moderate
Civic participation and rights	Low (<20%)
Digital well-being	Rare

Table 5. Conceptualisation of digital citizenship.

Findings: Open-ended responses confirmed narrow conceptualisations. Student-teachers equated digital citizenship mainly with rule-following and compliance like avoiding plagiarism, safeguarding privacy, and protecting data. Civic and participatory elements (e.g., rights, democratic engagement) were rarely mentioned, while digital well-being, despite being a lived challenge, was almost absent from their definitions.

Lecturers' understandings and delivery of digital citizenship (RQ2)

Interviews with eight lecturers highlighted conceptual ambiguity and practical challenges in embedding digital citizenship. Several lecturers conflated it with digital literacy or ICT skills. As one lecturer explained, 'Digital citizenship is basically digital literacy-how to use technology effectively and safely' (Lecturer 3). Others associated it primarily with moral regulation, focusing on respectful conduct: 'For me, it's more about teaching students not to cyberbully, not to spread hate, and to respect others online' (Lecturer 5). Another underscored the importance of patriotism as the foundation of citizenship education: 'This patriotic spirit is very important because it must start in primary school. Knowing the national anthem, recognising the leaders, and understanding the organisations that lead in that school are very important' (Lecturer 8). Meanwhile, six lecturers admitted unfamiliarity with the very concept of digital citizenship, with one candidly said: 'Because I have never heard of it before, so I don't know the importance of digital citizenship, but citizenship is

very important. Because they are part of the citizens even though they are non-Muslims and belong to different ethnicities' (Lecturer 4).

Pedagogically, lecturers reported limited institutional guidance and minimal professional development opportunities. As one noted, 'We don't have clear guidelines from the institution, so I just include bits of it in IT courses.' (Lecturer 6). Another added, 'The curriculum is already overloaded, and we don't get much training on this' (Lecturer 4). Consequently, most relied on ad-hoc integration, embedding digital citizenship in IT or Moral Education courses rather than treating it as a cross-curricular theme. While some expressed willingness to explore critical and ethical dimensions, they cited constraints such as curricular overload, lack of training, and political sensitivities. This echoes international research showing teachers' uncertainty in addressing digital ethics and participatory citizenship in politically constrained contexts (Leung & Ng, 2014).

These accounts suggest that lecturers' uncertainty is not simply individual but structural, reflecting how policy rhetoric on digital citizenship has not been translated into concrete curricular frameworks or professional development. This reproduces a compliance-oriented and fragmented approach, as later corroborated by student and policy data.

Policy and curriculum integration (RQ3)

Document analysis revealed a gap between policy aspirations and curricular enactment. The Malaysia Education Blueprint (2013-2025) and the Digital Education Policy (2023) foreground digital competence and global competitiveness yet provide little operational guidance on embedding digital citizenship in teacher education. References to ethics and civic responsibility appear largely rhetorical, lacking integration across subject areas.

ITE course syllabi further reflected this fragmentation. Digital skills were primarily addressed in IT-related modules, while citizenship themes were confined to Moral or Islamic Education, mirroring the silo effect identified in prior Malaysian studies (Kamarudin et al., 2021). The result is a curricular landscape that reinforces both the technocentric fallacy and isolationist pedagogy, with limited space for cross-cutting themes such as digital well-being or civic engagement.

Integrated analysis

When triangulated, three data sources reveal a clear policy-practice divide. Though national frameworks articulate ambitious visions of technologically adept citizens, these aspirations are not meaningfully translated into teacher education curricula or classroom practice. This misalignment produces a fragmented ecosystem in which digital citizenship is invoked rhetorically but implemented narrowly.

For student-teachers, the survey paints a portrait of digital saturation without criticality. Their almost universal access and intensive daily use of digital technologies demonstrate immersion in online spaces. But, this immersion is accompanied by limited verification practices, weak ethical reasoning in ambiguous online situations, and heavy emotional dependence on connectivity. These patterns confirm what Frau-Meigs et al. (2017) describe as the fluency-literacy gap that is confidence in functional use without corresponding evaluative depth. Importantly, the open responses show that student-teachers equate digital citizenship with compliance, like avoiding plagiarism, respecting rules, or protecting personal data while overlooking participatory and civic dimensions.

The lecturer interviews reinforce this compliance-oriented view but also highlight its institutional roots. Many lecturers explicitly equated digital citizenship with IT literacy or moral discipline, reproducing the technocentric fallacy and depoliticised traditions of Malaysian civic education. Their accounts reveal genuine willingness to address ethical or participatory aspects, nonetheless this potential is constrained by structural barriers for example overloaded curricula, absence of professional development, and political sensitivities around civic discourse. The result is a reliance

on ad-hoc integration, whereby digital citizenship is inserted into IT or Moral Education courses rather than treated as a cross-cutting theme.

The policy analysis exposes the upstream drivers of this fragmentation. The Malaysia Education Blueprint (2013-2025) and the Digital Education Policy (2023) consistently highlight employability, innovation, and ethics, but they lack operational pathways for embedding digital citizenship in ITE. At the curricular level, siloed structures further reinforce the isolationist pedagogy identified internationally: IT modules cover technical skills, while civic and moral elements remain confined to separate subjects. Digital well-being and participatory engagement are almost absent, leaving no coherent framework for educators to follow.

When considered together, these findings illustrate an institutional pattern of compliance without criticality. Student-teachers practise digital citizenship largely as personal responsibility and safety; lecturers conceptualise it as literacy and discipline; and policy frameworks privilege productivity and national competitiveness. What is missing across all three levels is a focus on participatory, ethical, and resilient engagement, dimensions central to Choi's (2016) model of critical digital citizenship.

This misalignment carries important consequences. If student-teachers graduate without the capacity to critically evaluate information, model ethical reasoning, or cultivate digital well-being, schools risk reproducing compliance-driven practices rather than fostering reflective, participatory citizens. Without institutional support, lecturers remain unable to challenge these trends. And without operational guidance, policies remain aspirational rather than transformative.

In sum, the evidence demonstrates that Malaysia's approach to digital citizenship in teacher education remains technocentric, fragmented, and compliance-oriented. Addressing this requires hybrid approaches that combine Ribble's structured breadth with Choi's participatory depth, embedded across curricula and supported by institutional development. The following discussion develops these implications further, situating the findings within global debates on teacher education and digital citizenship.

Discussion

This study examined how digital citizenship is conceptualised and experienced in Malaysian pre-service teacher education across three domains: student-teacher practices, lecturer understandings, and policy frameworks. The integrated analysis highlighted a systemic narrowing of digital citizenship into compliance, moral conduct and technical proficiency, with limited attention to critical, participatory and ethical engagement as well as well-being dimensions.

In this discussion, these findings are unpacked into four interconnected themes, as discussed below. Together, they illustrate how digital citizenship in Malaysian teacher education is currently defined by safety and procedural use rather than ethical reasoning, civic engagement or reflective resilience. By situating these themes within global debates, the discussion highlights both the risks of maintaining a compliance-driven model and the opportunities for adopting hybrid approaches that integrate Ribble's structured elements with Choi's participatory dimensions.

Fluency without criticality

Student-teachers exhibit high digital access and intensive daily use, yet this fluency does not translate into evaluative or civic competence. Most reported ease in searching for information, but only 57% consistently verified accuracy, and 40% reported difficulty understanding content. This fluency-literacy gap (Frau-Meigs et al., 2017) illustrates a disconnection between technical navigation and critical comprehension. For pre-service teachers, such uncritical habits are particularly consequential as they may shape students' digital practices toward procedural rather than reflective engagement.

Compliance orientation

Lecturer interviews reinforced a compliance-driven view, equating digital citizenship with ICT skills or moral conduct, *'Digital citizenship is basically digital literacy, how to use technology effectively and safely'* (Lecturer 3); *'It's more about teaching students not to cyberbully, not to spread hate, and to respect others online'* (Lecturer 5). Few explicitly addressed civic engagement, and pedagogical integration remained ad-hoc, embedded primarily in IT or Moral Education courses. Constraints included curriculum overload, minimal professional development, and political sensitivities. Consequently, students' rule-focused practices, lecturers' constrained interpretations and siloed curricula collectively reproduce a narrow conception of digital citizenship that prioritises obedience and safety over ethical reasoning and participatory engagement. These findings echo studies from politically constrained East Asian contexts, where teachers report uncertainty in addressing digital ethics and civic participation (Leung & Ng, 2014; Zhang et. al, 2022).

Neglected digital well-being

Digital well-being emerged as a largely overlooked dimension. Survey data indicated that 82% of student-teachers used the internet for emotional regulation, with 77% reporting distress when disconnected, including loneliness, depression and panic. Despite the prevalence of these experiences, both student conceptualisations and lecturers' coverage rarely addressed strategies for online-offline balance or emotional resilience. This highlights the need for teacher education to mainstream digital well-being, enabling educators to model healthy habits and cultivate reflective, resilient learners.

Policy-practice misalignment

Policy frameworks, including the Malaysia Education Blueprint (2013-2025) and the Digital Education Policy (2023), articulate ambitious goals for digital competence, global competitiveness and ethical awareness. However, operational guidance for embedding digital citizenship in teacher education is limited. Curricular structures reinforce silos: IT subjects focus on technical skills, while civic and moral dimensions are confined to Moral or Islamic Education. Politically sensitive aspects such as democratic engagement, rights or critical media literacy remain marginalised, reflecting longstanding depoliticised traditions in Malaysian civic education (Haniza, 2014; Mahadhir et al., 2020). This institutional misalignment results in aspirational policies, constrained pedagogy, and students' procedural habits converging to reproduce compliance-driven digital citizenship.

Integrated implications

Triangulation of student, lecturer, and policy document highlights a recurring pattern: fluency without criticality, compliance-oriented pedagogy, neglected well-being and fragmented policy enactment. Together, these factors limit digital citizenship to safety, rule-following and functional skills, while participatory, ethical, and evaluative dimensions remain underdeveloped. Misiaszek (2025) warns that such skill-based, depoliticised approaches risk reproducing hegemonic norms and limiting civic agency. In the Malaysian context, these gaps imply that student-teachers may graduate technically competent but ill-equipped to foster reflective, participatory, and resilient digital citizens in schools.

Implications for practice and policy

The findings suggest several interrelated pathways for reform. First, curricula should consider integrating Ribble's structured elements with Choi's participatory dimensions to ensure comprehensive coverage of technical, ethical, civic and well-being aspects. This cross-curricular integration can shift digital citizenship from ad-hoc instruction to a coherent, scaffolded experience.

Second, lecturer professional development is essential. Sustained training in digital ethics, critical media literacy, and participatory pedagogy, combined with peer learning and cross-department collaboration, can enable lecturers to support deeper student engagement.

Third, digital well-being should be mainstreamed as one of professional competency. Preparing teachers to model balance, resilience, and healthy digital habits addresses both personal and classroom outcomes.

Finally, policy frameworks require operationalisation. Aspirational statements must be translated into actionable mandates, supported by monitoring and accountability mechanisms to reinforce alignment across institutional levels.

A hybrid model, integrating Ribble's breadth with Choi's participatory depth, provides a holistic pathway. In adapting this model, Choi's element of critical resistance is reframed as critical reflection to better align with the Malaysian context, where overt forms of resistance may be politically sensitive or institutionally constrained. This reframing preserves the model's critical intent while emphasising reflective judgement, ethical reasoning, and informed decision-making as pedagogically viable alternatives. Such an approach equips educators to navigate digital spaces critically and ethically, fostering reflective, participatory, and resilient digital citizens among their students. Ultimately, these insights extend beyond the Malaysian context, contributing to broader international debates on how teacher education can respond meaningfully to digitally complex and ethically challenging environments.

Conclusion

This study has presented, to our knowledge, the earliest triangulated analyses of digital citizenship in Malaysian teacher education, drawing on survey, interview, and policy document. The evidence reveals a consistent narrowing of digital citizenship into compliance, literacy, and discipline, with limited attention to critical, participatory, and well-being dimensions. Student-teachers, while digitally immersed, lack critical evaluation and ethical reasoning; lecturers face conceptual ambiguity and institutional barriers; and policies remain aspirational without operationalisation.

By situating these findings within global scholarship, the study demonstrates that Malaysia reflects international challenges while also highlighting local structural and cultural constraints. Addressing these requires moving from rhetoric to reform by embedding digital citizenship across curricula, investing in lecturer development, and integrating digital well-being as a professional competency.

In doing so, Malaysian teacher education can shift from producing digitally competent but civically underprepared graduates toward cultivating educators capable of modelling reflective, ethical, and participatory citizenship in digital contexts. This contribution not only advances national practice but also adds to global debates on equipping teachers for the complexities of 21st-century digital life.

Future research directions

While this study offers valuable insights and practical contributions, it also opens new avenues for inquiry. First, longitudinal research could trace how student-teachers' understandings and practices of digital citizenship evolve across different stages of training, offering a dynamic view of competency development. Second, classroom-based ethnographies would provide richer insight into how digital citizenship is enacted in practice, capturing the everyday challenges and opportunities of embedding these themes in teaching. Third, comparative studies across urban and rural teacher education institutions could illuminate contextual differences in access, pedagogy, and institutional support. Finally, future work should extend beyond institutional settings to consider how extracurricular, familial, and community influences shape student-

teachers' digital practices and values. Pursuing these directions would complement this study's findings and help build a more comprehensive, context-sensitive understanding of digital citizenship in teacher education, both in Malaysia and internationally.

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