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Harnessing Digital Informal Learning for Quantity Surveying Student Development

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ABSTRACT: The growing digitalisation of the construction industry demands that future quantity surveyors develop strong digital competencies. While formal education remains central, students increasingly engage in *digital informal learning*- self-motivated use of online platforms, tools, and communities beyond the classroom. Despite its prevalence, little is known about how quantity surveying students harness digital informal learning, the skills they acquire, the barriers they encounter, and strategies for integrating such practices into their academic and professional development. This study employed a qualitative approach, guided by four research questions. Data were analysed thematically to explore the platforms students use, the competencies they develop, the challenges they face, and strategies to strengthen digital informal learning within higher education. The findings reveal that students rely heavily on platforms such as YouTube, LinkedIn, WhatsApp groups, and professional forums to acquire both technical competencies and employability skills. However, barriers such as poor internet access and time constraints hinder optimal engagement. Students expressed the need for institutional support, curriculum integration, and student-centred approaches to maximise the benefits of digital informal learning. The study concludes that digital informal learning is not peripheral but central to the way quantity surveying students engage with knowledge and professional skill-building.

KEYWORDS: Digital informal learning, quantity surveying students, professional competencies, employability skills, construction education.

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Introduction

The construction industry is becoming increasingly digitised, requiring future professionals such as quantity surveyors to develop strong digital literacy, adaptability, and self-directed learning skills (Liebenberg and Els, 2022). Traditionally, formal education has been the cornerstone of knowledge acquisition in quantity surveying (Ebekozien and Aigbavboa, 2024). However, the rapid growth of digital technologies, social media platforms, online communities, and open-access resources has created new opportunities for learning outside the structured classroom environment. This phenomenon, commonly referred to as digital informal learning, involves the use of digital platforms to acquire knowledge, share experiences, and build competencies in an unstructured, self-driven manner (He and Li, 2019; Tazhenova et al., 2024). For students in quantity surveying, digital informal learning may include engaging with online forums, video tutorials, collaborative platforms, professional networking sites, or digital tools that simulate industry practices. Such learning experiences can foster academic growth, professional development, and employability skills, thereby complementing formal curriculum delivery.

Despite its growing relevance, limited attention has been given to how quantity surveying students specifically harness digital informal learning, the kinds of skills they acquire through it, and the challenges they encounter in the process. Few studies specify actual platforms for digital informal learning; Masanet et al. (2019) mention YouTube, while Leiß & Rausch (2023) highlight information-seeking and peer support. Most others are abstract. Mehrvarz (2021), Heidari (2021), and He (2021) provide strong evidence that digital competence and digital informal learning improve performance and engagement, which can be linked to QS professional skills. Identified barriers include the underutilization of collaboration tools (Degner, 2022), cultural/competence gaps (He & Li, 2019), gender differences (He, 2018), and negative emotional factors (Leiß & Rausch, 2023). Suggested strategies include competence training, user-friendly platforms, integrating digital media into pedagogy, and fostering collaboration/social interaction (He & Li, 2019; Tazhenova, 2024; Heidari, 2021).

While digital informal learning has been widely recognised in broader higher education contexts, its role in the development of quantity surveying students remains underexplored. Many students rely heavily on digital resources outside the classroom; however, there is a lack of systematic understanding of the platforms they use, the professional and employability skills they acquire, and the barriers that constrain effective engagement. Furthermore, strategies for integrating or complementing digital informal learning within formal academic structures are not clearly articulated. Without this knowledge, educators and institutions may miss opportunities to leverage digital informal learning as a powerful tool for student development in an increasingly digital professional landscape. Such knowledge will provide insights into how quantity surveying students can maximise digital informal learning opportunities to complement formal education. By identifying the platforms and practices that enhance professional competencies and employability skills, students will be better positioned to take charge of their personal and career development in a highly digitalised industry.

It will inform lecturers and curriculum developers about the hidden learning practices students already engage in beyond the classroom. Recognising these practices can help educators design teaching strategies that align with students' digital learning habits and encourage a blended approach that bridges formal and informal learning. Universities and training bodies can utilise the findings to develop policies and support systems that promote digital informal learning, such as integrating recommended platforms, providing digital resources, or offering guidance on self-directed online learning. This may also contribute to improving student outcomes and readiness for professional practice. This research contributes to preparing future professionals who are not only technically competent but also digitally literate, adaptable, and capable of continuous self-learning. As the industry adopts Building Information Modelling (BIM), digital project management, and collaborative platforms, graduates accustomed to digital informal learning will be more effective in adopting and applying new technologies. It will also fill a gap in the existing body of literature by focusing specifically on quantity surveying students—a group whose engagement with digital informal learning has not been widely examined.

Research Aim and Research Questions

This study aims to explore how quantity surveying students harness digital informal learning for their academic and professional development. The study aimed to address the following research question: What digital platforms and tools do quantity surveying students most frequently utilise for informal learning? How does digital informal learning enhance the professional competencies of quantity surveying students? What barriers hinder quantity surveying students from fully engaging in digital informal learning? What strategies can be developed to strengthen the role of digital informal learning in quantity surveying education?

Literature review

Previous studies provide valuable insights into digital informal learning (DIL), but their relevance to the specific context of quantity surveying (QS) education varies. In terms of identifying the digital platforms and tools most frequently used for informal learning, the literature offers only partial answers. Degner et al. (2022) show that both portable and stationary digital media are used almost equally in informal learning contexts, with emerging interest in augmented reality. However, the focus remains on functional categories rather than specific platforms. Masanet et al. (2019) go further by identifying YouTube as a central tool for adolescents' acquisition of transmedia skills, which can be extrapolated to QS students who often rely on video-based tutorials for software learning. Similarly, Leiß and Rausch (2023) emphasise the importance of online information-seeking and peer consultation in resolving digital problems, although their study focuses specifically on software troubleshooting. Overall, while these findings highlight the centrality of information-rich platforms such as YouTube, search engines, and peer networks, there is limited direct evidence of the platforms most relevant to QS students, particularly those aligned with professional applications like BIM or cost management software.

When considering the role of DIL in enhancing professional competencies, several studies underscore the link between digital competence and learning outcomes. Mehrvarz et al. (2021) demonstrate that digital informal learning mediates the relationship between digital competence and academic performance, implying that informal engagement is not merely supplemental but contributes directly to measurable outcomes. Heidari et al. (2021) and He et al. (2021) similarly show that digital competence improves academic engagement and learning behaviours, with informal learning mediating or reinforcing these effects. For QS education, this suggests that cultivating students' digital competence is likely to improve their ability to engage informally with domain-specific tools, thereby strengthening competencies in areas such as measurement, contract administration, and project management. Degner et al. (2022) also highlight the potential of digital media to support cognitive and motivational processes, while Tazhenova et al. (2024) emphasise the role of digital media in enhancing engagement and motivation, though with less evidence of direct cognitive gain. These findings confirm that informal learning is a meaningful contributor to competency development, although the studies rarely specify competencies in professional fields, such as QS.

The literature also highlights barriers that hinder students' engagement with digital informal learning. Degner et al. (2022) highlight the underutilization of collaborative functions in digital tools, while He and Li (2019) emphasise that cultural factors and technology expectancy significantly influence learning behaviours, suggesting that cultural diversity in QS classrooms may shape the uptake of informal learning. He et al. (2018) identify gender-based differences in digital competence, which may limit equitable engagement. Leiß and Rausch (2023) introduce a psychological perspective, noting that irritation, annoyance, and even experimentation may negatively affect perceived learning outcomes, while guilt and social support foster them. These findings suggest that barriers extend beyond technical access to include cultural, psychological, and gendered factors that impact the quality of engagement. However, most of these studies do not address structural barriers such as the cost of access, digital infrastructure, or lack of domain-specific resources, which may be more pressing in QS education in developing contexts.

Ultimately, the reviewed studies offer strategic recommendations for enhancing digital informal learning in higher education. He and Li (2019) emphasise the importance of digital competence training and user-friendly platform design to ensure inclusivity across cultural contexts. Heidari et al. (2021) recommend institutional provision of efficient and engaging platforms to sustain academic engagement, while Tazhenova et al. (2024) advocate integrating media technologies into pedagogy to boost motivation and active involvement. Georgopoulou et al. (2023) add a conceptual dimension by proposing frameworks that integrate formal and informal learning with critical digital literacy, offering a useful design lens for QS education. Despite these recommendations, most strategies remain broad and non-disciplinary, with little attention to tailoring informal learning approaches to specific professional fields such as quantity surveying. Previous studies collectively highlight that digital informal learning is

supported by general-purpose platforms (such as YouTube and search engines), improves learning outcomes through digital competence, and faces barriers shaped by cultural, psychological, and gender differences. They also propose strategies that emphasise competence training, user-friendly design, and pedagogical integration. However, significant gaps remain in relation to quantity surveying education, particularly regarding the identification of QS-specific platforms and tools, the direct mapping of informal learning to professional competencies, and the contextual barriers that affect students in developing economies. Addressing these gaps will be crucial to developing targeted strategies for leveraging digital informal learning in QS education.

Methods

This study employed a qualitative research design to investigate how quantity surveying students utilise digital informal learning for their academic and professional development. A qualitative approach was considered appropriate because it allows for an in-depth understanding of students' experiences, perceptions, and challenges within their natural learning contexts. The population for this study comprised undergraduate quantity surveying students at Obafemi Awolowo University, Ile-Ife, Nigeria. Using purposive sampling, 22 students were selected across different levels of study (from 200 to 500 levels). This sampling ensured a diversity of perspectives, capturing variations in digital informal learning practices among students at different stages of their academic journey. Data were collected through semi-structured interviews. An interview guide was developed based on the research questions, covering areas such as platforms and tools used for digital informal learning, skills acquired, challenges encountered, and suggestions for enhancing digital informal learning. Each interview lasted between 30 and 45 minutes and was conducted either face-to-face or virtually, depending on participants' availability. With consent, all interviews were audio-recorded and later transcribed verbatim. Questions asked in the interview include:

- What digital platforms and tools do quantity surveying students most frequently use for informal learning?
- In what ways do quantity surveying students engage with digital informal learning outside the formal classroom?
- How does digital informal learning enhance the professional competencies of quantity surveying students?
- What employability skills do students report gaining through digital informal learning activities?
- What barriers hinder quantity surveying students from fully engaging in digital informal learning?
- How do students perceive the limitations of digital informal learning in their academic and professional development?

- What strategies can be developed to strengthen the role of digital informal learning in quantity surveying education?
- How can academic institutions support students in leveraging digital informal learning for holistic development?

The data were analyzed using thematic analysis, following Braun and Clarke's six-step approach: (1) Familiarization with data through repeated reading of transcripts; (2) Initial coding of meaningful units related to the research questions; (3) Searching for themes by grouping similar codes; (4) Reviewing themes to ensure alignment with the dataset; (5) Defining and naming themes to capture their essence; and (6) Producing the final report, supported with illustrative quotes from participants. Themes were organised around the four research questions: (i) platforms and tools used; (ii) competencies developed; (iii) challenges encountered; and (iv) strategies for improvement. To ensure credibility and reliability, measures such as member checking (selected participants reviewed the transcripts and summaries of findings for accuracy), triangulation (data were compared across participants at different study levels to identify consistent patterns), peer debriefing (emerging themes were discussed with colleagues in the built environment discipline to validate interpretations), and audit trail (detailed documentation of the research process was maintained to enhance transparency). Participants were informed of the study's purpose and assured of confidentiality and anonymity. Informed consent was obtained before data collection, and participants retained the right to withdraw at any time without consequence.

Results and Discussion

The thematic analysis in Table 1 shows that digital informal learning is already a vibrant and impactful practice among quantity surveying students, shaping both their academic and professional development. However, its potential is curtailed by barriers that require institutional recognition and strategic support. By aligning formal education with students' informal practices, universities can foster a more holistic and future-ready learning ecosystem. A consistent pattern from RQ1 is the heavy reliance on social media platforms (such as WhatsApp and LinkedIn) and video-based resources (like YouTube) for informal learning. These platforms are favoured for their accessibility, immediacy, and collaborative features. Unlike formal institutional platforms (for example, Learning Management Systems, or LMS), students tend to gravitate toward tools that are flexible and peer-driven. This highlights that students' preferred digital spaces are often outside the formal control of institutions. Universities need to recognise and align teaching strategies with the platforms students already use, rather than relying solely on traditional learning management systems. From RQ2, digital informal learning was found to contribute not just to technical skill development (for example, BIM, cost estimation software) but also to soft skills such as communication, networking, and adaptability. Students reported acquiring relevant knowledge more quickly than through classroom instruction. This suggests that digital informal learning is a valuable complement to formal education, equipping students with a broader skill set that aligns with industry expectations. It supports the view that informal learning helps bridge the gap between academic

knowledge and professional practice.

RQ3 revealed structural barriers, such as poor internet access and limited access to credible resources, alongside individual challenges, including time constraints and difficulty evaluating quality information. These barriers limit the depth and consistency of students' engagement with digital informal learning. This highlights the need for systemic interventions, such as enhancing digital infrastructure, and personal development interventions, including teaching digital literacy and critical evaluation skills. Without addressing these barriers, the benefits of digital informal learning cannot be fully realised. Under RQ4, students suggested institutional support (providing access to professional platforms, workshops) and curriculum integration (embedding recommended digital resources into coursework) as ways to strengthen digital informal learning. They also emphasised student-centred approaches, such as peer-to-peer learning and recognition of digital practices within formal assessment. This underscores the importance of moving from a passive tolerance of digital informal learning to an active integration of it within academic programs. Institutions that adopt these strategies can cultivate digitally literate, self-directed learners who are better prepared for the modern construction industry.

The thematic analysis of quantity surveying students' digital informal learning practices, as analysed in Table 1, confirms much of what the broader literature suggests, while also offering sharper discipline-specific insights. Regarding RQ1 (platforms and tools), the findings indicate that QS students heavily rely on social media platforms (WhatsApp, LinkedIn) and video-based resources (YouTube) for informal learning. This corroborates Masanet et al. (2019), who identified YouTube as a key site for transmedia skill development, and Leiß and Rausch (2023), who stressed the role of online information-seeking and peer support. However, while Degner et al. (2022) emphasised general digital media functions (information retrieval, AR, collaboration), they did not highlight the strong preference for peer-driven and accessible platforms that were revealed in this study. Likewise, studies such as He and Li (2019) and Heidari et al. (2021) discuss the importance of digital competence but are less attentive to the specific platforms students gravitate toward. The contrast here is clear: whereas much of the literature remains abstract, the findings of this study pinpoint the everyday platforms shaping QS students' informal learning, underscoring the mismatch between institutional reliance on formal LMSs and students' preference for flexible, collaborative, and non-institutional tools.

For RQ2 (contribution to competencies), this study's findings demonstrate that digital informal learning enhances not only technical skills, such as BIM and cost estimation software, but also soft skills, including communication, networking, and adaptability. This aligns strongly with Mehrvarz et al. (2021) and Heidari et al. (2021), who demonstrated that DIL mediates the relationship between digital competence and academic performance or engagement, thereby enhancing overall outcomes. Similarly, Degner et al. (2022) and Tazhenova et al. (2024) reported the motivational and social benefits of digital media use, which align with the soft skills that QS students reported. Yet, the findings of this study extend these insights by explicitly mapping DIL outcomes to QS professional competencies,

providing a discipline-specific layer that is often missing from most studies. Importantly, QS students reported acquiring relevant knowledge more quickly than in classrooms, suggesting that informal digital practices bridge the academic–industry gap more directly than formal instruction—a nuance not captured in broader higher education researRegarding RQ3 (barriers), the analysis identifies structural obstacles, such as poor internet access and limited credible resources, alongside individual challenges, including time constraints and difficulty in evaluatingting information quality. These findings partially corroborate earlier work: He and Li (2019) highlighted cultural and competence-related differences, while He et al. (2018) identified gender disparities, and Leiß and Rausch (2023) pointed to emotional barriers such as frustration. However, the structural barriers evident in this study – especially unreliable infrastructure and resource scarcity – are largely absent from the global literature, which tends to assume relatively robust digital ecosystems. This contrast highlights the contextual realities of QS students in developing economies, where infrastructural deficits can significantly curtail the depth of digital engagement. This study's findings, therefore, add a critical dimension to the literature, stressing that access issues, not just competence or attitudes, must be addressed.

Finally, for RQ4 (strategies), students in this study called for institutional recognition of informal practices through measures such as access to professional platforms, workshops, and integration of digital resources into the curriculum. This aligns with recommendations from Heidari et al. (2021), who emphasised user-friendly platforms, and Tazhenova et al. (2024), who advocated for greater integration of media technologies into pedagogy. Georgopoulou et al. (2023) further emphasise the importance of connecting formal and informal learning spaces through intentional design. Yet, this study's findings go further by revealing student-driven strategies such as peer-to-peer learning, recognition of digital practices in assessment, and embedding of industry-relevant platforms into coursework. These student-centred proposals highlight a shift from passive acknowledgement of informal learning, often found in the literature, toward active institutional integration that directly supports QS students' professional preparation.

Table 1

Thematic analysis of quantity surveying students' digital informal learning practices

Research Question	Themes Identified	Findings
RQ1: What digital platforms and tools do quantity surveying students most frequently use for informal learning?	• Social Media Platforms • Video-based Learning • Professional/Technical Tools	"I rely heavily on YouTube tutorials for cost estimation software." "WhatsApp groups with classmates help me exchange materials quickly." "LinkedIn and professional forums expose me to industry trends."
RQ2: How does digital informal learning enhance the professional competencies of	• Technical Skill Development • Employability Skills	"Through online forums, I learned how to use BIM-related applications." "Sharing content on LinkedIn improved

quantity surveying students?	• Lifelong Learning Habits	my communication and networking skills." "It helps me stay up to date without waiting for lectures."
RQ3: What barriers hinder quantity surveying students from fully engaging in digital informal learning?	• Technological Constraints • Quality/ Credibility Issues • Personal and Environmental Challenges	"Poor internet access sometimes discourages me from learning online." "It's hard to know which resources are reliable." "Balancing coursework with time spent on digital learning is a struggle."
RQ4: What strategies can be developed to strengthen the role of digital informal learning in quantity surveying education?	• Institutional Support • Curriculum Integration • Student-Centered Approaches	"Universities should give us access to paid professional platforms." "Lecturers could recommend credible YouTube channels and websites." "Workshops on evaluating digital resources would be very useful."

Source: author's own development

Conclusions

This study examined the role of digital informal learning in the development of quantity surveying students, focusing on the platforms they utilise, the skills they acquire, the challenges they encounter, and strategies to enhance its educational impact. The findings reveal that students are already highly engaged in digital informal learning, primarily through social media, video-based resources, and professional platforms. These practices significantly enhance their technical competencies and employability skills, bridging gaps between classroom learning and industry expectations. However, persistent barriers such as limited internet access, challenges in evaluating credible resources, and time management constraints hinder optimal engagement. Despite these challenges, students express a strong desire for institutional support, curriculum integration, and the creation of student-centred digital learning initiatives. In conclusion, digital informal learning is not peripheral but central to the way quantity surveying students learn, adapt, and prepare for professional practice. Harnessing it effectively can produce graduates who are not only academically competent but also digitally literate, self-directed, and industry-ready.

Based on the findings, several targeted recommendations are advanced for students, educators, institutions, and the broader quantity surveying profession. For students, it is essential to cultivate critical digital literacy skills that enable them to evaluate the credibility of online resources. They are also encouraged to actively participate in professional networks such as LinkedIn and BIM forums, as these platforms provide valuable opportunities to strengthen employability prospects. At the same time, students should learn to balance their formal coursework with informal digital learning to maximise the

benefits of both without experiencing information overload. For educators, greater recognition of students' preferred digital platforms—such as YouTube and WhatsApp groups—can help improve teaching strategies and enhance engagement. Educators should also recommend credible online resources while curating digital toolkits that align with curriculum objectives. In addition, fostering peer-to-peer digital learning communities is encouraged, as such interactions can effectively complement formal classroom activities.

At the institutional level, efforts should be directed toward strengthening digital infrastructure, particularly by ensuring reliable internet access across campuses. Institutions should also provide access to paid professional learning platforms, including specialised resources such as RICS databases and BIM software tutorials. Furthermore, organising workshops on self-directed learning, digital resource evaluation, and professional networking will help equip students with essential lifelong learning skills. Finally, for the quantity surveying profession and industry, collaboration with universities is recommended to develop industry-aligned digital learning modules. The profession should also support students' access to professional digital platforms and online communities, recognising that such engagement is integral to their development. Importantly, digital informal learning should be formally acknowledged as a critical pathway for continuous professional development in the profession.

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