Challenges and Determinants of Digital Business Innovation Ideation: An Empirical Study of University Students' Experience

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Abstract

This qualitative descriptive study explores how undergraduate students in an Applied Digital Business program identify and develop innovation ideas, the barriers they encounter, and the institutional support they require. Survey and interview data reveal a consistent pattern: while most students recognise digital knowledge as critical for ideation, many struggle to transform concepts into validated prototypes, citing technical gaps and uncertainty over business-model design. Technology trends and shifts in user behaviour emerge as the dominant catalysts for idea generation, yet diagnosing meaningful real-world problems remains a central challenge. Qualitative insights highlight the need for structured mentoring, live market exposure, and interdisciplinary collaboration. The paper proposes three curricular interventions, studio-based prototyping, an external mentor pool, and validation sandboxes with local SMEs, to bridge the ideation–execution divide. These findings enrich the discourse on student innovation capability and offer practical guidance for higher-education programmes aiming to cultivate applied digital entrepreneurship

Keywords: Digital innovation; student entrepreneurship; ideation barriers; higher education;

Introduction

Digital disruption is re shaping competitive logics across every industry, compelling firms to recruit graduates who can identify technology driven shifts and convert them into scalable venture. In response, universities worldwide have established digital business and entrepreneurship program designed to fuse technical literacy with entrepreneurial execution (Martínez-Román & Romero, 2017). Early evaluations, however, reveal a stubborn gap between ideation, students' ability to spot opportunities, and implementation, their capacity to develop validated prototypes and robust business models (Ahmad et al., 2019; Choi-Lundberg et al., 2023).

To close that gap, educators have imported a repertoire of innovation frameworks diffusion stages to sensitise students to adoption dynamics, lean start up cycles to foster iterative learning (Wen, 2018) and the Business Model Canvas to structure value capture (Osterwalder & Pigneur, 2010). Parallel ecosystem approaches highlight the importance of mentoring networks, maker spaces, and policy instruments in sustaining the idea to market journey (Borrás & Edquist, 2013; Gorzelany et al., 2021). Yet systematic reviews show that evidence remains fragmented, frequently limited to short term mindset shifts or isolated course pilots in resource rich contexts (Wurthmann, 2014).

Three unresolved questions therefore motivate the present study and frame the ensuing literature review:

1. Where exactly do digital business students stall along the innovation pipeline, during problem framing, prototype build out, or revenue logic design? (Gutiérrez-Zepeda, 2020).
2. Within a single emerging-economy university context (Universitas Islam Indonesia), which barriers most strongly constrain students' progress from ideation to development? (Lopes et al., 2025; Suryani et al., 2021)
3. What institutional supports do students perceive as most helpful for navigating those barriers, and how do these perceptions map onto ecosystem prescriptions offered in prior studies? (Gutiérrez-Zepeda, 2020; Thompson & MacMillan, 2010)

Addressing these questions is particularly salient within Indonesia's higher-education context, part of Southeast Asia's rapid digital uptake yet characterised by persistent institutional gaps. Focusing on a single institution, the Applied Bachelor in Digital Business at Universitas Islam Indonesia–, this study traces students' trajectories from opportunity recognition to early market testing while foregrounding their perceived support needs. As a theory-informing case from an emerging-economy university, the evidence refines accounts of student innovation pipelines and offers actionable guidance for curriculum designers and policy makers at UII and comparable institutions, while clearly delineating the study's single-site scope and the conditions under which its insights may transfer.

Literature Review

Conceptualising Digital-Innovation Ideation

Innovation scholars positions ideation as the critical first stage in a value-creation cycle that links technology shifts to commercial or social outcomes. A study by Drucker framed entrepreneurship as the "systematic practice of innovation," emphasizing deliberate search for change and disciplined analysis of opportunities (Peter Drucker, 1985). Building on this opportunity-recognition view, Tidd and Bessant argued that rapid digital transformation expands the pool of weak signals that students must scan, but also heightens the risk of superficial idea generation without clear problem–solution fit (Tidd, Pavitt, 2018).

Rogers' diffusion model explains how novel ideas spread, highlighting knowledge acquisition and persuasion as antecedents of adoption (Everett et al., 2021). Complementing this macro lens, Osterwalder and Pigneur's business model canvas offers a microstructure for translating an insight into a coherent value proposition and revenue logic (Osterwalder & Pigneur, 2010). Together, these frameworks underline that ideation quality cannot be divorced from downstream considerations of adoption and monetization. What remains under-examined is how these stage models play out end-to-end in emerging-economy classrooms where access to mentors, users, and tools is uneven.

Student Entrepreneurship Capability in Higher Education

Empirical studies show that university programs can cultivate opportunity recognition, yet capability development remains uneven. Survey evidence across European campuses finds that digital business students draw ideas primarily from perceived technology trends and shifting user behaviour (Martínez-Román & Romero, 2017). Experimental courses that embed lean start up or studio pedagogy improve self-efficacy, but shifts in mindset do not always translate into validated prototypes (Wen, 2018). Longitudinal research indicates that only a minority of graduates advance (Wurthmann, 2014). Recent reviews of technology-enhanced learning similarly catalogue many digital innovations in course design but note fragmented evaluation and limited tracing of outcomes along the full pipeline from ideation to market testing (Choi-Lundberg et al., 2023). The gap here is a lack of pipeline-level diagnosis, i.e., where students actually stall and why, in single-institution studies from emerging economies.

Determinants and Barriers of Digital Innovation Ideation

Recent systematic reviews catalogue three clusters of obstacles: (i) technical execution, (ii) resource mobilisation, and (iii) market validation. The digital tools uplift idea quantity but not necessarily implementation competence; students often lack advanced prototyping skills (Gutiérrez-Zepeda, 2020). Mixed methods evidence from emerging economy universities adds that motivational barriers, fear of simplistic ideas or of failure, amplify technical gaps (Lopes et al., 2025).

In digital domains, platform dynamics create new sources of entrepreneurial opportunity but also fierce competitive pressure. Another study contend that ecosystems intensify the need for rapid iteration and partner search, raising the bar for student teams with limited social capital (Zhou & Cen, 2024). Pedagogical studies consistently identify "complexity bias", an inclination toward feature heavy concepts, as a frequent ideation trap (Bock et al., 2012). What is still limited are empirical studies that measure both the technical/resource barriers and the psychological hesitancies in tandem, especially within a single emerging-economy institution.

Institutional Ecosystems and Support Mechanism

A growing body of work reframes universities as multi actor innovation ecosystems. Previous study demonstrate that structured mentoring and cross disciplinary collaboration predict higher prototype completion rates (Bock et al., 2012). In addition, "culture of innovation" must be intentionally cultivated through incentive systems and dedicated innovation spaces (Gorzelany et al., 2021). At the policy level (Borrás & Edquist, 2013) argue that carefully chosen instruments, grants, incubators, procurement schemes, shape the opportunity set available to nascent entrepreneurs.

In emerging economies, institutional voids intensify capability gaps (Ahmad et al., 2019) observe that students face constrained finance and market access yet demonstrate high adaptability, while (Suryani et al., 2021) highlight the role of local SMEs as living laboratories that ground ideation in real problems. Thompson's work similarly warns that without durable support structures, entrepreneurial intentions dissipate during transition to market (Thompson & MacMillan, 2010). Still under-specified are the mechanism-linked supports that students themselves prioritise (e.g., studios, mentor cadence, validation access), and how these map onto measured stall points along the pipeline.

Synthesis and Research Gap

Across these streams, consensus emerges that digital knowledge can catalyse ideation but does not guarantee execution. Technical and resource barriers converge with psychological hesitancies, particularly where institutional scaffolding is thin. Prior work tends to (i) map isolated barriers, (ii) document short-term mindset shifts in course pilots, or (iii) discuss ecosystem elements without connecting them to measured bottlenecks. Moreover, Southeast Asian emerging-economy settings remain under-represented. This study addresses these omissions by providing a pipeline-level, single-institution diagnosis from Indonesia: (1) identifying where digital-business students stall (problem framing, prototype build-out, revenue logic), (2) quantifying both technical/resource constraints and simplicity anxiety as a psychological barrier, and (3) linking stall points to student-voiced, mechanism-ready supports (studio-based prototyping, mentor cadence, validation sandboxes with SMEs). In doing so, the study extends theory on student innovation pipelines from a focus on mindset to a conditions-of-conversion perspective that is portable to comparable resource-constrained universities.

Research Method

Data and sample

This study adopts a descriptive-exploratory qualitative design. We started by showing strand maps patterns of ideation and innovation barriers through a structured survey, whereas the qualitative strand explores institutional-support needs via open-ended items and semi-structured interviews. To be specific, to answer 1st research question survey is applied (descriptive statistics) using items on ideation challenges and development barriers; corroborating qualitative insights from interviews/open-ended survey items. Qualitative interview elaborations for contextual nuance. Meanwhile, the third question is explored through qualitative analysis of interview transcripts and open-ended survey responses.

A structured online questionnaire was distributed to students in the Applied Bachelor's Program in Digital Business at Universitas Islam Indonesia. A total of 139 valid responses were collected. The questionnaire consisted of multiple-choice, Likert-scale, and open-ended items covering sources of innovation, perceived challenges, role of technology knowledge, and suggestions for institutional support. Quantitative data were using descriptive statistics to support the qualitative data and delivering exact information to the reader, qualitative responses were analyzed thematically to identify recurring patterns and key insights.

The Interview guide was developed from the University Innovation Ecosystem framework and content-validated by two entrepreneurship-education experts for about 30 minutes and conducted via Zoom, recorded, and transcribed verbatim.

Results and Discussion

Situated in an emerging-economy university, the evidence contributes four context-specific novelties. First, a near-parity of ideation triggers, technology trends and social/environmental cues, contrasts with many Western-centric patterns and suggests an opportunity landscape shaped by proximity to UMKM/SMEs rather than technology scanning alone. Second, a measurable "simplicity anxiety" co-occurs with difficulty converting ideas into solutions, clarifying a psychological mechanism behind premature feature-loading and weak problem-solution fit. Third, an upstream ordering of barriers is observed: technical execution and resource mobilisation consistently precede business-model design and market validation, refining pipeline accounts derived largely from resource-rich settings. Fourth, triangulated convergence between survey results and student-voiced themes yields mechanism-linked scaffolds, studio-based prototyping, mentor cadence, and validation sandboxes, specifying the institutional conditions under which high digital awareness converts into functioning prototypes.

The findings refine pipeline accounts of student innovation by specifying stage-wise bottlenecks and the institutional conditions under which progression occurs in an emerging-economy university. Three contributions are advanced. First, the scaffolded conversion proposition: digital awareness converts into working prototypes only when three scaffolds co-occur, hands-on studios that build procedural skill, mentor cadence that counteracts complexity bias in design choices, and access to validation resources (users/SMEs, data) that disciplines solution development. This extends diffusion- and lean-oriented views (Osterwalder & Pigneur, 2010) by identifying the institutional complements necessary for movement along the pipeline. Second, a problem-gateway complement to lean: requiring evidence-backed pain-points before solution brainstorming reduces premature feature loading and normalises "simplicity grounded in evidence," addressing a measurable form of simplicity anxiety captured in the sample. Third, a context-specific ideation-trigger parity: technology trends and social/environmental cues appear in tandem, suggesting that opportunity recognition in this setting is shaped as much by proximity to locally salient problems (e.g., UMKM/SMEs) as by technology scanning. Together, these propositions integrate capability, barrier, and ecosystem perspectives (e.g., (Bock et al., 2012; Borrás & Edquist, 2013; Choi-Lundberg et al., 2023; Martínez-Román & Romero, 2017), moving the literature beyond mindset change toward a conditions-of-conversion perspective that is portable to comparable resource-constrained universities.

Digital Technology Knowledge: A Strong Foundation with Practical Gaps

The Likert distribution (n = 139) from Picture 1 shows a steeply positive skew: 66 students (47.5 %) selected "5 = very helpful" and 54 (38.8 %) chose "4", yielding 120 respondents (86.3 %) who view digital knowledge as a strong catalyst for ideation. Only a single student (0.7 %) rated its role as "2", and none chose "1", while 18 students (12.9 %) occupied the neutral midpoint ("3"). The complete visualisation can be seen in Figure 1 below:

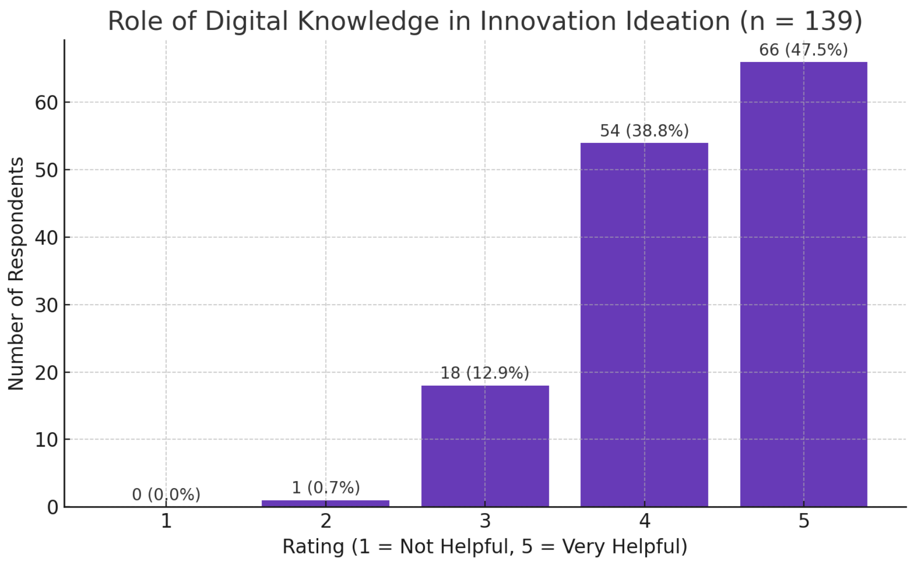


Figure 1. Chart Data "Role of Digital Knowledge in Innovation Ideation"

Source: Primary Data

Yet the qualitative data reveal a paradox: 83 students (≈ 60 %) still report lacking the technical competence to build working prototypes. This previous study observation that conceptual familiarity with digital tools seldom guarantees production-ready proficiency (Gutiérrez-Zepeda, 2020). The most plausible explanation is curricular imbalance: classroom discourse highlights emerging technologies, but practical exposure, coding sprints, prototyping studios, or industry-issued micro-credentials, remains limited. Bridging modules that convert awareness into mastery are therefore imperative if institutions wish to close the ideation-execution gap.

2. Ideation Sources: Technology-Centric but Socially Informed

Digital-technology trends (89 responses, 64 %) remain the single most-cited catalyst for ideation, closely followed by social / environmental issues (87 responses, 62.6 %) as shown by Picture 2. Personal experience (55; 39.6 %) and observed shifts in user behaviour (41; 29.5 %) rank next, while media or journal references (37; 26.6 %) and "other" sources (6; 4.3 %) trail behind. The complete visualisation can be seen in Figure 2 below:

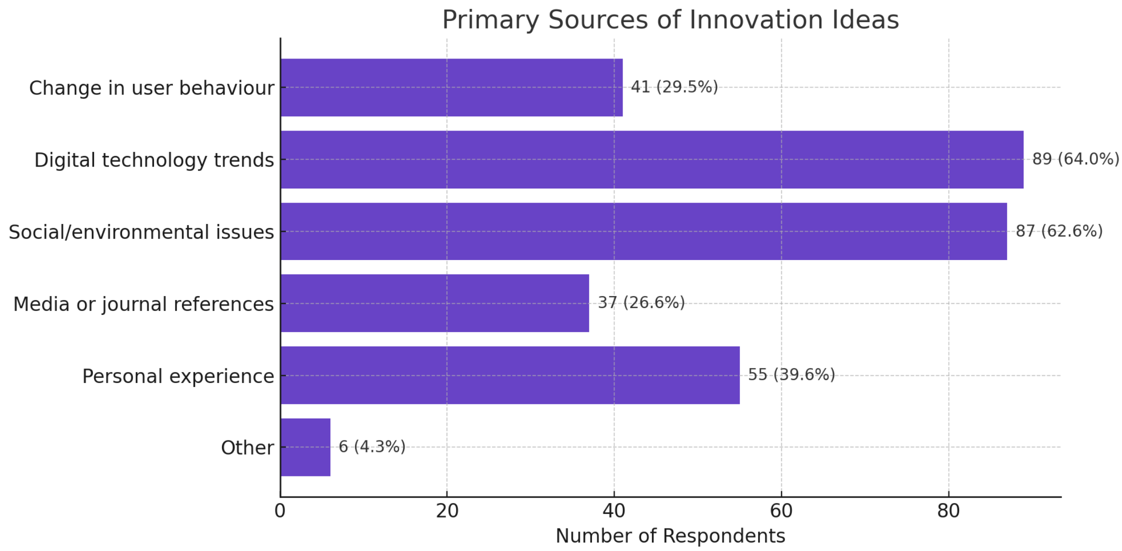


Figure 2. Chart Data "Primary Sources of Innovation Ideas"

Source: Primary Data

Although strong attention to technology signals aligns with opportunity-recognition theory, the near-parity between tech trends and societal problems suggests a bifurcated focus: students either scan headlines for emerging tools or respond to contextual pain-points around them. Yet interviews reveal that technology-led ideas often remain surface-level, risking ephemeral solutions with weak problem-solution fit, whereas socially anchored ideas show deeper resonance but face feasibility doubts.

This pattern implies the need for integrative pedagogy. Embedding design-thinking ethnography and field immersion can help students validate real-world problems before overlaying technological features, while trend-analysis workshops can ensure that tech-driven ideas are grounded in verifiable user needs. Such a dual track may rebalance student ideation portfolios toward solutions that are both innovative and societally relevant.

3. Ideation Challenges: Problem-Finding as the Bottleneck

The pie-chart data (Figure 3) clarify that the principal ideation bottlenecks cluster around execution and problem framing. "Difficulty turning ideas into concrete solutions" tops the list (39 students; 28.1 %), closely followed by "Fear that ideas are unrealistic or too simple" (38; 27.3 %). "Difficulty finding a truly relevant problem" ranks third (29; 20.9 %), while technology-trend ignorance (18; 12.9 %) and collaboration gaps (7; 5 %) trail behind. The complete visualisation can be seen in Figure 3 below:

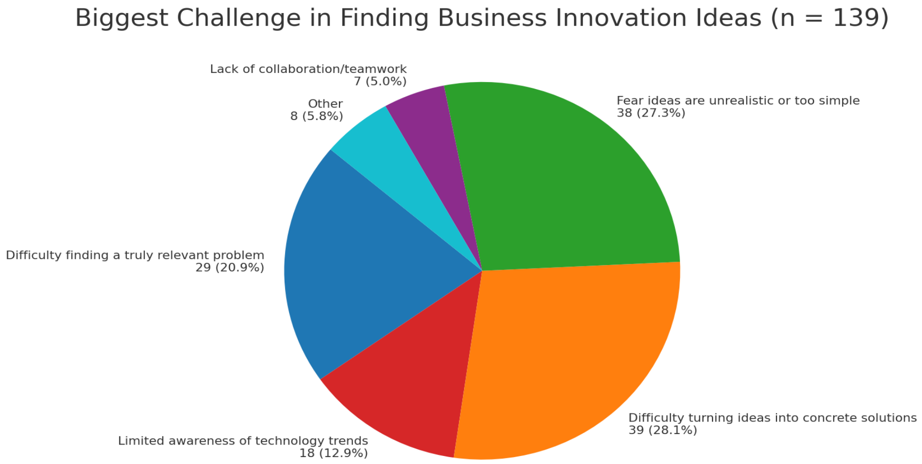


Figure 3. Chart Data "Biggest Challenge in Finding Business Innovation Ideas"

Source: Primary Data

These findings refine Osterwalder and Pigneur's (2010) warning that teams often jump prematurely from vague inspiration to product features: students are not only leaping too soon but also doubting the legitimacy of simple solutions. Such fear can drive them toward feature-heavy concepts that lack validated pain-points, mirroring Choi-Lundberg et al.'s (2023) observation of "complexity bias" in novice innovators.

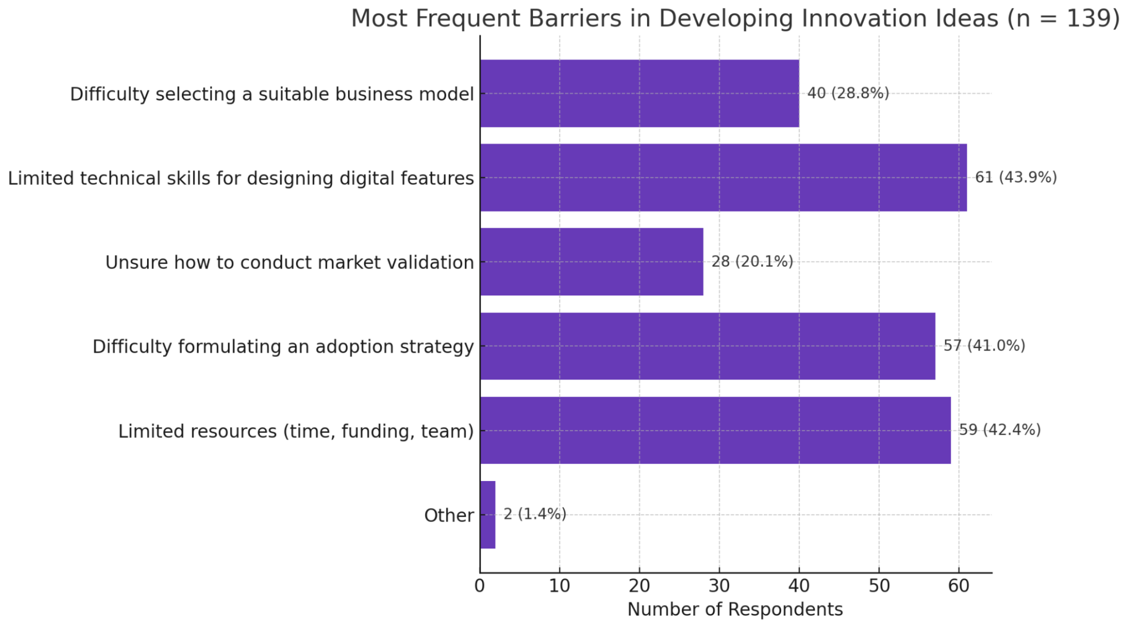
To counter this, there should be a scaffolded "problem gateway":

1. Micro-pitch sprints where students present a single, evidence-backed pain-point in ≤ 90 seconds.
2. Rapid peer and mentor feedback focused solely on problem clarity, no solutions permitted.
3. Iterative refinement until the cohort (or a rubric) deems the problem statement both specific and user-validated. Only then do teams proceed to ideation.

Research on design thinking shows that delaying solution brainstorming until problems are crystallised improves novelty and feasibility. Embedding this gateway in coursework could normalise "simplicity grounded in evidence" and reduce the anxiety that currently pushes one in four students toward unnecessarily complex, or abandoned, ideas.

4. Development Barriers: From Concept to Commercial Logic

Technical execution remains the primary stumbling block: 61 students (43.9 %) cite limited digital-feature skills, closely shadowed by resource constraints, time, funding, or team, at 59 students (42.4 %), and adoption-strategy design at 57 students (41.0 %). The classic business-model question, while still sizeable, ranks lower (40 students; 28.8 %). Market validation lags furthest behind (28; 20.1 %) as shown by Figure 4.



Picture 4. Chart Data "Most Frequent Barriers in Developing Innovation Ideas"

Source: Primary Data

This ordering refines Zhou et al.'s (2024) observation that entrepreneurial curricula often decouple product build from revenue logic: here, students choke first on technical execution and resourcing before even reaching business-model or validation stages. The relative neglect of market testing aligns with Choi-Lundberg et al.'s (2023) "downstream myopia," whereby novice innovators underestimate later-stage risks.

To correct this bias, programmes should embed live-market micro-pilots: small cohorts release minimum-viable products to real users under tight resource caps. Such immersion simultaneously pressures technical delivery, surfaces resource limits, and forces early validation, thereby knitting together the fragmented skill set revealed by the data.

5. Integrative Interpretation (Qualitative Focus)

The charts above depict an "attention funnel": students enthusiastically scan digital-technology signals and recognise the value of digital knowledge (86 % rate it highly), yet many stall first at problem framing (21 %) and more sharply at technical execution (44 %) and resource mobilisation (42 %). Qualitative comments corroborate this pattern. Respondents repeatedly cited "butuh arahan mentor" (need mentor guidance), "contoh kasus nyata" (real case briefs), and "tim lintas jurusan" (interdisciplinary teams) as missing ingredients. These requests echo Lopes et.al.'s (2018) entrepreneurial skill-bottleneck theory, which argues that idea pipelines clog when institutional scaffolds do not translate abstract knowledge into practiced competence. In short, students possess awareness and curiosity, but the pathway from insight to implementation narrows dramatically without structured guidance and collaborative contexts.

6. Institutional Implications (Derived from Qualitative Insights)

1) Curricular rebalancing toward studio-based prototyping.

Persistent difficulty in converting ideas into functioning artefacts and early stalling at technical execution indicate that declarative knowledge of tools is not yet becoming procedural skill. A studio model addresses this by using repeated, time-boxed practice with immediate feedback to close the awareness-execution gap. In practice, a proportion of lecture hours is reallocated to credit-bearing studios with weekly build sprints (code/low-code) and tool clinics (e.g., version control, UX wireframing, analytics), supported by graduate teaching assistants and rotating "clinic leads." Impact can be evidenced through a prototype-progression rubric (functionality, reliability, UX), repository analytics (commit velocity and issue closure), studio attendance, short pre/post practical checks, and the share of teams able to demonstrate a minimum-viable product by mid-semester.

2) Structured mentoring infrastructure (technical + business-model cadence).

Hesitation toward "simple" solutions and uncertainty in design choices point to a tendency toward complexity and slow decision cycles. A regular mentor cadence counteracts complexity bias, supplies just-in-time heuristics, and accelerates choice closure across engineering and revenue-logic decisions. Implementation involves establishing a standing mentor pool comprising software engineers and business-model coaches, pairing each team with two mentors, and scheduling fortnightly reviews supported by concise artefacts (decision logs and three-slide progress briefs), complemented by asynchronous channels for code reviews and business-model feedback. Effectiveness can be tracked through time-to-milestone, the volume of unresolved blocking issues per sprint, the evidentiary quality of pivots recorded in decision logs, student ratings of mentor usefulness, and adherence to the planned mentor cadence.

3) Validation sandboxes with local SMEs.

Weak market-testing routines and uncertainty around adoption strategy reflect limited access to users, real data, and realistic constraints. Validation sandboxes supply these missing ingredients, compelling early experiment design and tying features to evidence while clarifying adoption pathways. Delivery entails formalising MOUs with SMEs/UMKM to provide user panels, anonymised datasets, and short problem briefs; requiring minimum-viable experiments (e.g., concierge tests, landing-page trials, A/B probes) before full solutioning; and equipping teams with ethics templates and simple evidence dashboards to track results. Evaluation can draw on the number and quality of early experiments, the proportion of design decisions citing user evidence, improvements on an adoption-strategy rubric, and follow-on engagement from SME partners (such as extended pilots).

4) Enabling conditions and expected impact.

To ensure these interventions are mutually reinforcing, small resource tranches can be released as micro-grants against milestone evidence, work can be time-boxed on a fixed sprint calendar, cross-programme teaming (e.g., informatics and design) can be enabled for skill complementarity, and platform access (repositories, prototyping, analytics) can be secured through institutional licences. The combined effect targets the measured execution, resourcing, and validation constraints and increases the probability that studios, mentoring, and sandboxes convert high digital awareness into functioning prototypes with credible pathways to adoption. Marginal gains are expected to be highest in settings where access to mentors, tools, users, and small-scale funding is uneven; in more resource-rich environments, the problem-gateway, mentor cadence, and sandboxing remain beneficial, albeit with smaller incremental effects.

Conclusion

This qualitative investigation set out to map how digital-business students generate innovation ideas, identify the points at which they falter, and clarify the institutional support they deem most valuable. The findings reveal a consistent pathway of enthusiasm followed by constraint. Students recognise digital knowledge as a critical enabler and actively monitor technology trends, yet they struggle to frame validated problems and, more acutely, to execute technically robust prototypes or navigate resource limitations. Qualitative evidence underscores that the absence of structured mentoring, interdisciplinary teaming, and live-market exposure compounds these challenges.

By triangulating survey frequencies with student narratives, the study demonstrates that entrepreneurial competence is less a matter of idea scarcity than of scaffold scarcity. Introducing studio-based prototyping, formal mentor pools, and validation sandboxes with local SMEs emerges as a concrete strategy to convert awareness into implementation. These recommendations not only address immediate curricular gaps in the Applied Digital Business programme but also extend the literature on university innovation ecosystems by foregrounding student-identified bottlenecks in an emerging-economy context.

Future research could test the efficacy of the proposed interventions through longitudinal designs or quasi-experiments, tracing whether enhanced scaffolding measurably improves prototype quality, market validation rates, and venture survival. Such work would refine our understanding of how higher-education institutions can move beyond inspiration to systematically cultivate applied digital entrepreneurship. Furthermore, Future studies may expand this research by incorporating longitudinal methods to track changes in student innovation competencies over time. Comparative studies across institutions or countries could yield insights into how cultural or structural factors shape student innovation behavior. Experimental designs that evaluate the impact of specific pedagogical interventions, such as real-time mentoring or co-creation with industry, are also recommended.

Limitation

This study was limited to students enrolled in a single Innovation Management course within one university's Digital Business program. As such, the findings may not be generalizable to students from other disciplines or institutions. Additionally, while both quantitative and qualitative methods were employed, the self-reported nature of survey responses may introduce bias or misinterpretation of experiences.

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References

Ahmad, A., Bhatt, P., & Acton, I. (2019). *Entrepreneurship In Developing And Emerging Economies 2020*. Opensource.

Bock, A., Opsahl, T., George, G., & Gann, D. (2012). *The Effects of Culture and Structure on Strategic Flexibility During Business Model Innovation*. https://doi.org/10.1111/j.1467-6486.2011.01030.x

Borrás, S., & Edquist, C. (2013). The choice of innovation policy instruments. *Technological Forecasting and Social Change*, *80*(8), 1513–1522. https://doi.org/10.1016/j.techfore.2013.03.002

Choi-Lundberg, D. L., Butler-Henderson, K., Harman, K., & Crawford, J. (2023). A systematic review of digital innovations in technology-enhanced learning designs in higher education. *Australasian Journal of Educational Technology*, *39*(3), 133–162. https://doi.org/10.14742/ajet.7615

Everett, D., Ke, W., Paquet, J.-F., Vujanovic, G., Bass, S. A., Du, L., Gale, C., Heffernan, M., Heinz, U., Liyanage, D., Luzum, M., Majumder, A., McNelis, M., Shen, C., Xu, Y., Angerami, A., Cao, S., Chen, Y., Coleman, J., … Wolpert, R. L. (2021). Phenomenological Constraints on the Transport Properties of QCD Matter with Data-Driven Model Averaging. *PHYSICAL REVIEW LETTERS*, *126*(24). https://doi.org/10.1103/PhysRevLett.126.242301

Gorzelany, J., Gorzelany-Dziadkowiec, M., Luty, L., Firlej, K., Gaisch, M., Dudziak, O., & Scott, C. (2021). Finding links between organisation's culture and innovation. The impact of organisational culture on university innovativeness. *PLoS ONE*, *16*(10 October), 1–21. https://doi.org/10.1371/journal.pone.0257962

Gutiérrez-Zepeda, M. del P. (2020). Solutions and strategies of Nezahualcoyotl´s business before the pandemic. In *Journal Macroeconomics and Monetary economy* (pp. 16–27). ECORFAN. https://doi.org/10.35429/jmme.2020.7.4.16.27

Lopes, J. M., Gomes, S., & Nogueira, E. (2025). Educational insights into digital entrepreneurship: the influence of personality and innovation attitudes. *Journal of Innovation and Entrepreneurship*, *14*(1). https://doi.org/10.1186/s13731-025-00475-y

Martínez-Román, J. A., & Romero, I. (2017). Determinants of innovativeness in SMEs: disentangling core innovation and technology adoption capabilities. *Review of Managerial Science*, *11*(3), 543–569. https://doi.org/10.1007/s11846-016-0196-x

Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A handbook for visionaries, game changers and challengers*.

Peter Drucker. (1985). The discipline of innovation. *Harvard Business Review*, *63*(3), 67–72.

Suryani, N. K., Dewi, L. K. C., & Foeh, J. E. (2021). Business Creation through Creativity and Innovation among Students. *Jurnal Minds: Manajemen Ide Dan Inspirasi*, *8*(2), 225. https://doi.org/10.24252/minds.v8i2.20981

Thompson, J. D., & MacMillan, I. (2010). *Business Models: Creating New Markets and Societal Wealth*. https://doi.org/10.1016/J.LRP.2009.11.002

Tidd, Pavitt, B. (2018). Integrating Technological Market. *Wiley*, *May*, 75–87.

Wen, J. (2018). *Practice and Research on Innovation and Entrepreneurship Education of College Students based on "Internet plus" New Normal*. *290*(Icedem), 151–153. https://doi.org/10.2991/icedem-18.2018.39

Wurthmann, K. (2014). Business students' attitudes toward innovation and intentions to start their own businesses. *International Entrepreneurship and Management Journal*, *10*(4), 691–711. https://doi.org/10.1007/s11365-013-0249-4

Zhou, J., & Cen, W. (2024). Digital Entrepreneurial Ecosystem Embeddedness, Knowledge Dynamic Capabilities, and User Entrepreneurial Opportunity Development in China: The Moderating Role of Entrepreneurial Learning. *Sustainability (Switzerland)* , *16*(11). https://doi.org/10.3390/su16114343