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Innovating Higher Education: AI "Vibe Coding" Takes Center Stage and Sparking Entrepreneurial Thinking at KNUST

A bold experiment in AI-assisted teaching inspires educators to foster innovation and entrepreneurial intention across disciplines.

Kumasi, Ghana, November 5, 2025

In a brightly lit ICT lab tucked inside KNUST's Prempeh II Library, a group of educators and innovators gathered for a workshop unlike any other. Laptops opened and imaginations sparked, they were there to rethink how we teach and learn in the age of artificial intelligence. Under the EU-funded UNIHUBS initiative, a collaboration connecting African and European universities to modernise curricula, the

"Pedagogical Innovations for Teaching and Learning in Higher Education Institutions: Teaching AI Coding / Vibe Coding"

workshop unfolded as a bold experiment in education. The lead facilitator posed a challenge that sounded almost whimsical:

"could you "code" an app by simply describing your idea and letting AI do the rest?"

By the end of the day, participants would do just that, blurring the line between coder and creator. This strong vision and hands-on approach set the tone for an event that may well foreshadow the future of teaching in higher education.


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Pedagogical Innovations in Action: From AI Coding to "Vibe" Learning

The workshop's narrative was driven by a clear theme, innovating pedagogy for the AI era, and it delivered on that promise. At its heart was the concept of "vibe coding," a novel approach where one expresses intentions in plain language and AI transforms that input into executable code[2]. Rather than manually writing software line-by-line, educators experienced how generative AI can handle the heavy lifting of coding. What might have sounded like science fiction a few years ago is now an emerging reality: the instructor's role shifts to guiding ideas and curating problems, while AI acts as the diligent junior developer. This paradigm, teaching AI coding through vibe coding, captivated the room.

Crucially, the innovative vibe coding practice did not stand alone. It was interwoven with Design Thinking, Generative AI (GenAI) literacy, and an emphasis on cultivating an innovative digital attitude. Participants were first guided through design thinking exercises, ensuring any technology solutions remained human-centered and problem-driven. (Design thinking, after all, "promotes creativity, a user-oriented approach and interdisciplinary collaboration" [3] in education, making it a perfect backbone for tech innovation.) They empathised with end-user needs, brainstormed bold ideas, and prototype solutions, all within the context of AI-assisted development. Simultaneously, the facilitators fostered GenAI literacy, giving attendees a crash course in how modern AI models work, their
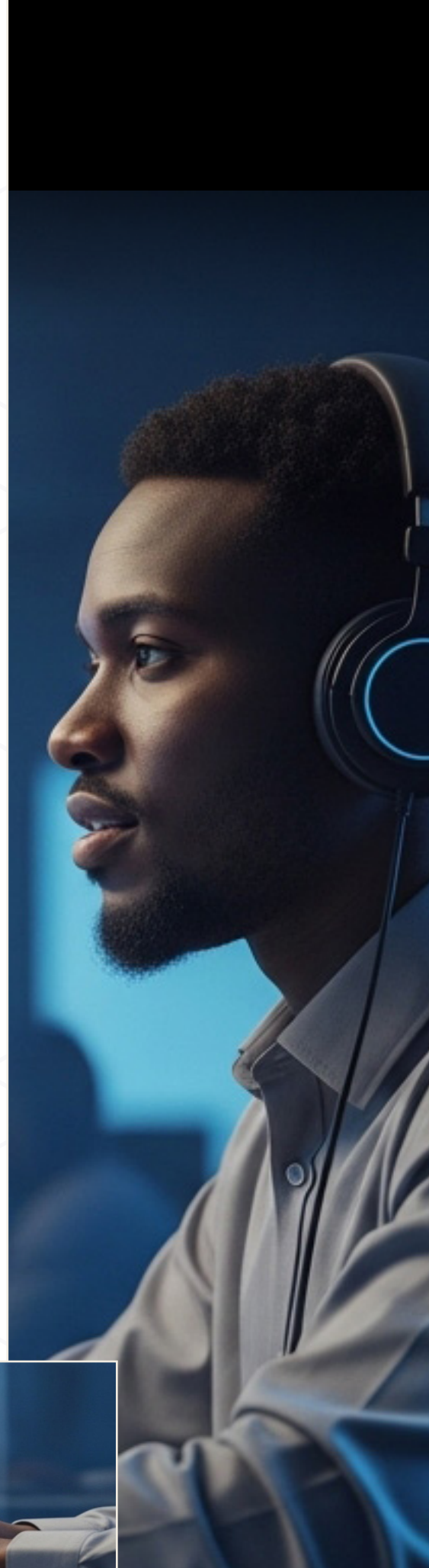
capabilities and limitations, and how to deploy them responsibly in academia. This wasn't just a coding workshop; it was a crash course in speaking the new language of AI. Rounding it out was a focus on "innovative digital attitude" a mindset of curiosity and resilience toward new technologies. Participants were encouraged to approach AI tools with an open mind, viewing them not as threats or gimmicks but as partners in creativity and problem-solving.

"I learned to stop fearing the AI and start collaborating with it,"

one faculty participant noted on the workshop's Canvas discussion board.

"That change in attitude from skeptic to explorer was perhaps the most valuable outcome."

A "GamiFlipped" Classroom: Flipping the Script with Gamification

To execute this multifaceted learning experience, the workshop employed a hybrid "GamiFlipped" strategy; essentially, a gamified flipped classroom model. In the days before the in-person session, participants engaged with preparatory materials online (hosted on KNUST's Canvas LMS), including short video tutorials and AI-driven interactive quizzes. Arriving at the workshop, they were already primed with baseline knowledge, freeing up time for rich, hands-on activities. The "flipped" aspect meant less lecturing and more doing during the face-to-face portion, while the "gamified" layer added competition, rewards, and playfulness to keep energy high. Research strongly supports this blend: combining gamification with flipped learning has been shown to increase learner motivation, autonomy and content retention, while also improving satisfaction and performance[4]. Indeed, as the workshop unfolded, one could see theory turning into practice. Attendees tackled challenges in teams, earning digital badges for completing certain tasks and climbing a friendly leaderboard that tracked collective points. There was palpable excitement in the air, a spirit of competition tempered by collaboration. "The GamiFlipped approach made the learning so immersive that I didn't even notice time passing," admitted one lecturer with a smile. "By the end of the day I realised I'd absorbed more than in any traditional seminar." The impact on engagement was clear: participants were not just consuming content, but actively playing with new ideas. By structuring the learning this way, the organisers ensured everyone came prepared and stayed involved, no small feat for an all-day workshop. And as studies suggest, this integration is highly effective in boosting student motivation and satisfaction[5], a result mirrored in the overwhelmingly positive feedback from attendees.

The Digital Toolkit: NotebookLM, Wooclap, Wayground, Canvas, and AI Studio

One hallmark of this workshop was its savvy use of digital tools, each chosen to enhance a facet of the learning experience. Canvas LMS formed the backbone, hosting pre-workshop modules and a reflection forum for participants. It was on Canvas that attendees found reading materials and posted their thoughts, priming a collaborative spirit even before they met in person. Within Canvas, interactive elements were embedded to keep the pre-work lively: Wooclap, an audience response platform, turned passive readings into active quizzes and polls, allowing participants to test their understanding and even pose questions to facilitators in real time. Similarly, Wayground (formerly known as Quizizz) brought a game-based quizzing element into the mix. Wayground is originally a "game-based quiz platform" that has evolved into a full educational suite with AI-generated quizzes, interactive videos, flashcards, and digital lessons[6] was used to generate quick-fire challenges that reinforced key concepts. With its built-in integration into Canvas and other LMS, Wayground allowed facilitators to seamlessly assign and grade these quizzes in minutes[6]. The result was a flipped classroom

prep that felt less like homework and more like an online scavenger hunt, fueled by instant feedback and friendly competition. During the live workshop, attention turned to cutting-edge AI-powered tools. Google's NotebookLM was introduced as a secret weapon for research and brainstorming; a "personalised AI partner for research and thinking" that can analyse sources, summarise information, and help make connections faster[7]. Participants watched in awe as NotebookLM digested a sample academic paper and produced a concise summary and flashcard-style Q&A, demonstrating new ways to master complex material. "It's like having a research assistant on demand," observed one attendee, impressed with how the tool could turn dense content into clear insights. Meanwhile, on the development front, participants were given a tour of Google AI Studio, a newly launched platform that promises "the fastest way to start building with Gemini, [Google's] next-generation family of multimodal generative AI models"[8]. In practice, this meant that even those with minimal coding background could spin up AI-driven apps by leveraging pre-built models (like Gemini) and simple drag-and-drop interfaces. The facilitators demonstrated how

Google AI Studio could be used to create a rudimentary chatbot in minutes, an example of vibe coding in action, where the heavy lifting (natural language understanding, code generation) was handled by Google's powerful backend. Rounding out the toolkit was Google NotebookLM's integration with Google AI Studio, showing a pipeline from ideation to execution: brainstorm an idea with NotebookLM, then prototype it in AI Studio. It was a compelling illustration of how modern educators and students might soon build solutions by harnessing AI at every step, from learning a concept to implementing it.
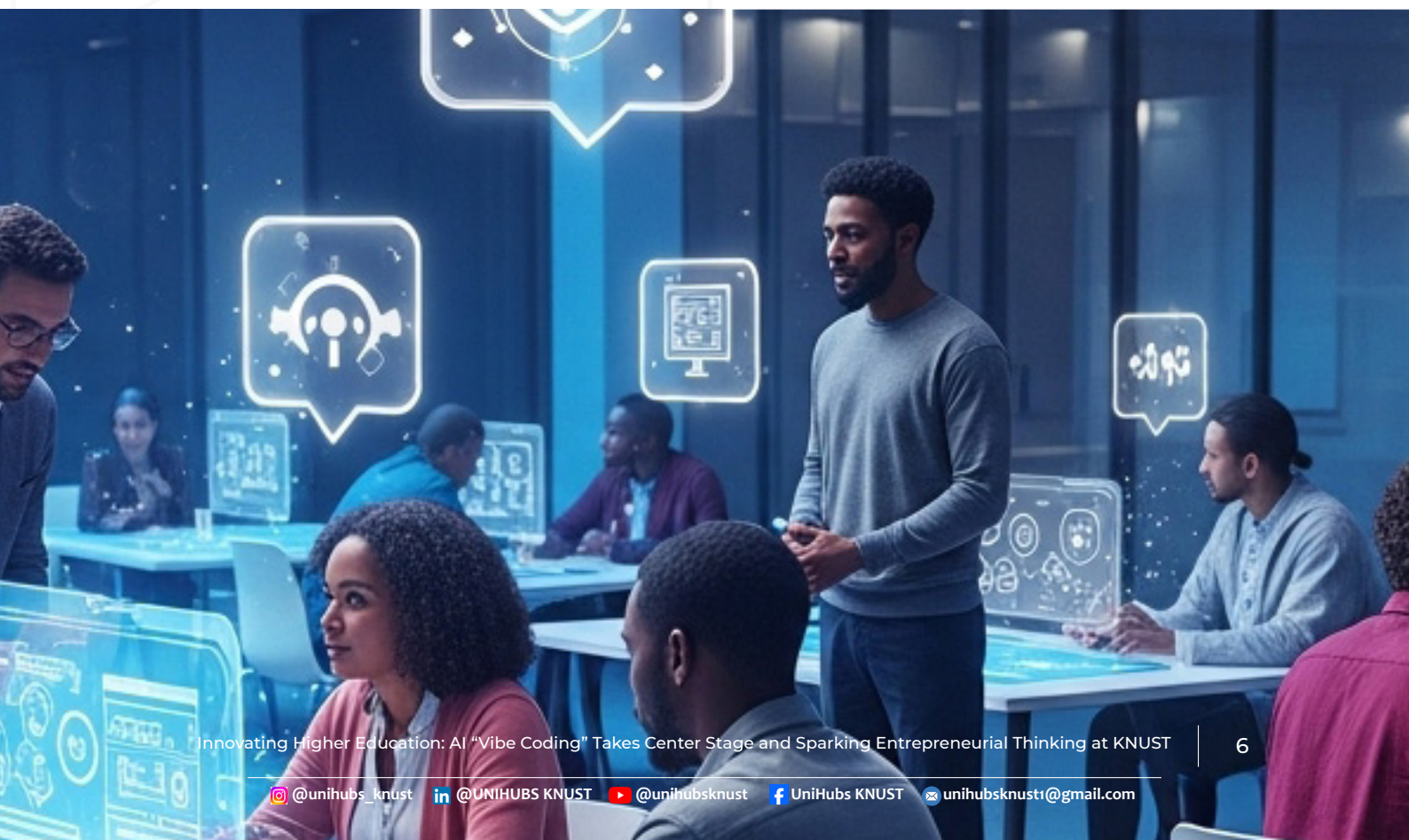
From Ideas to Apps: Participant Projects and Peer Showcases

The true climax of the workshop came as theory gave way to creation. Armed with design thinking principles and these advanced tools, participants broke into small groups to develop their own mini-apps or prototypes that addressed a challenge in teaching and learning. The room buzzed with creativity. Some teams focused on educational solutions where one group designed an "AI Study Buddy" chatbot to tutor students in difficult courses, while another prototyped an adaptive quiz app that adjusts question difficulty on the fly. Others tackled campus life and community issues: an enterprising team built a prototype for a campus navigation assistant (to help newcomers find their way around KNUST's sprawling grounds), and yet another sketched out a mental health support app that uses AI to check in on students' well-being. What unified all these projects was the method: instead of coding everything from scratch, teams described what they wanted in natural language and let vibe coding tools generate the underlying code. "It felt like magic, we typed out what the app should do, and the AI just started building it," one participant marveled. Of course, human ingenuity was still very much in play; teams had to iteratively refine their AI-generated code, debug issues, and tweak the design. This collaborative dance between human and machine yielded impressive results in a short time.

To cap it off, the workshop turned into a showcase competition. Each team presented their app concept and a quick demo to their peers, effectively teaching the rest of the cohort about the problem they addressed and the solution they prototyped. The presentations were lively: some groups staged skits to illustrate student pain points, others live-demoed their chatbots answering questions from the audience. After all the presentations, a peer voting session took place (using Wooclap to collect votes in real time). This added a fun gamification element. Every team was eager to see how their peers rated their idea. When the votes were tallied, the top three projects were announced amid cheers. First place went to the AI Study Buddy chatbot for its potential to democratise tutoring. Second place was claimed by the mental health support app, lauded for tackling a sensitive issue with technology and empathy. Third place went to the adaptive quiz app, a testament to improving assessments in education. The winning teams earned more than bragging rights; in the spirit of the workshop's theme, they received symbolic "Innovation Champion" badges and copies of a well-regarded book on design thinking. But as one participant noted, "the real prize was seeing what we could create in such a short time, it was a confidence boost for all of us."

Voices from the Workshop: Reflections and Revelations

In the days following the event, participants took to the Canvas LMS forum to reflect on their experiences, and their comments speak volumes about the workshop's impact. "This workshop fundamentally changed my approach to teaching," one senior lecturer wrote.

"I walked in curious about AI; I walked out convinced that AI-powered tools can enhance academic practice, not replace it."

Many remarked on the power of Design Thinking coupled with AI. Another participant posted,

"The design thinking exercises helped me clarify what problem I actually wanted to solve. By the time I got to coding with AI, I wasn't just playing with a cool toy, I was building something purposeful."

Several attendees admitted initial skepticism about the GamiFlipped format, then discovered how effective it was. "Flipped prep meant I wasn't lost during the hands-on part, and the gamification kept me on my toes," one reflection noted. "I might try this

approach with my own students." Indeed, the ripple effects of the workshop seem poised to extend well beyond the single day. Perhaps the most striking sentiment came from a young teaching assistant, who wrote:

"I realised that to educate the AI generation, we as educators must be willing to learn and unlearn continually. This workshop made me feel excited about the future, instead of fearful."

Such reflections underscore a critical point: the workshop was as much about mindset as it was about skills. By creating a space where faculty and professionals could play, experiment, fail, and try again with emerging technologies, the organisers succeeded in cultivating that innovative digital attitude they aimed for. The Canvas discussion has since evolved into a mini-community of practice; participants continue to share resources on GenAI literacy and updates on how they're integrating these tools into their courses. In effect, the workshop did not end when the last laptop closed; it simply shifted venues, from the physical lab to an online space of ongoing collaboration.

Lessons Learned and Looking Ahead

As a two-page newsletter can only capture a snapshot of the experience, it's worth distilling the key lessons and considering future directions sparked by this event. First, the success of the workshop reaffirmed that educators are eager to embrace innovation when it's presented in a meaningful context. Grounding AI tools in pedagogical design (via design thinking) and evidence-based strategies (like flipped classrooms and gamification) made the unfamiliar feel purposeful and accessible. It's a formula other institutions could replicate. Second, the hybrid learning model proved its worth. By blending asynchronous prep with an intensive, interactive session, the workshop respected participants' time while maximising value, a well-suited format for busy professionals and perhaps a blueprint for faculty development programs in the digital age.

Third, investing in GenAI literacy pays off. Participants not only learned how to use specific tools, but also grappled with broader questions of AI ethics, data privacy, and the evolving role of a teacher. In an era when generative AI is advancing at breakneck speed, such literacy is becoming as fundamental as ICT skills were a decade ago.

From an editorial standpoint, one cannot help but place this KNUST workshop within a global narrative. Around the world, universities are experimenting with how to integrate artificial intelligence into teaching and learning, some cautiously, others exuberantly. What happened on November 5 in Kumasi exemplifies a proactive, can-do approach: don't ban the AI or fear it, learn it, harness it, and reshape pedagogy around it. It is the kind of bottom-up innovation that aligns with broader initiatives to modernise higher education. (Notably, UNIHUBS itself exists to "improve HEIs' capacity in adopting innovative educational approaches" and bridge academia with digital innovation ecosystems[1].) The workshop's outcomes suggest that when given the right environment, educators in Africa (and anywhere) can leapfrog into new teaching paradigms, potentially even leading the way. There was a palpable sense of empowerment among attendees, a realisation that they can be agents of change in their institutions, armed with new tools and ideas.

The immediate future directions from this workshop include plans for follow-up sessions and scaling the training. Organisers noted that the top three prototype projects might be incubated further, for instance, by connecting those teams with computer science students or startup hubs for full development. There is also talk of integrating elements of the workshop into KNUST's regular faculty training and even into the student curriculum (imagine a semester-long course on "AI for Problem Solving" drawing on this model). Perhaps most importantly, the workshop forged a network of like-minded educators. One can expect cross-campus collaborations to spring from this group, as they continue exchanging lessons on the Canvas space and beyond.

Sparking Entrepreneurial Thinking

Imagine building an app by simply describing your idea, no coding background required. That's what lecturers at KNUST experienced during a groundbreaking workshop that merged artificial intelligence, design thinking, and entrepreneurship education.

Under the EU-funded UNIHUBS Project, the workshop "Pedagogical Innovations for Teaching and Learning in Higher Education Institutions: Teaching AI Coding / Vibe Coding" brought together educators determined to rethink how universities can ignite entrepreneurial mindsets through teaching innovations.

By the end of the day, participants weren't just learning about AI; they were designing solutions that could evolve into real entrepreneurial ventures.

Reimagining Teaching for Entrepreneurial Intention

At the core of the workshop was Vibe Coding, a method that allows educators to express programming intentions in natural language while AI generates the executable code. This approach transforms lecturers from code writers into idea architects, enabling anyone with a concept to bring it to life.

But beyond the technology, Vibe Coding served as a pedagogical metaphor for entrepreneurship: turning ideas into action through experimentation and iteration. Participants learned that in both coding and entrepreneurship, creativity begins with curiosity while success comes through prototyping and testing.

The facilitators, led by Prof. Harry Barton Essel, guided participants through Design Thinking stages, empathising with learner needs, defining real-world problems, and ideating solutions with social and commercial value. By applying AI tools within this human-centered process, participants gained hands-on experience in transforming classroom concepts into scalable, entrepreneurial innovations.

"I realised that entrepreneurship isn't just about business it's a way of thinking creatively to solve problems," reflected one participant.

From Pedagogy to Innovation Mindset

The workshop emphasised that entrepreneurial education is not about teaching business plans, but about fostering innovation mindsets: curiosity, collaboration, and risk-taking. Through Generative AI (GenAI) literacy sessions, attendees explored how tools like ChatGPT, NotebookLM, and Google AI Studio can amplify creative ideation and help educators prototype new learning solutions.

Participants were also encouraged to adopt what the facilitators called an "innovative digital attitude", the willingness to experiment with emerging technologies and model entrepreneurial resilience for students.

"I learned to stop fearing AI and start collaborating with it," said a lecturer, that mindset that shifts from skeptic to explorer is what I'll bring to my students."

A "GamiFlipped" Classroom: Turning Learning into a Venture

To deliver this transformation, facilitators employed a "GamiFlipped" model; a hybrid of flipped learning and gamification.

Participants completed short online modules on KNUST's Canvas LMS before attending the in-person session. These pre-activities introduced them to AI tools, freeing up time for hands-on innovation during the workshop. Once on site, competition, teamwork, and playful design fueled creativity.

Digital badges, live leaderboards, and collaborative challenges mirrored the startup ecosystem: dynamic, goal-driven, and deeply participatory. "The GamiFlipped approach made the learning so immersive that I didn't even notice time passing," one participant said.

This model not only enhanced engagement, it embodied the entrepreneurial learning cycle of action, feedback, and reflection.

Smart Tools for Creative Entrepreneurs

The digital ecosystem powering the workshop showcased how technology can be leveraged for innovation:

- Canvas LMS: Hosted pre-workshop modules and collaborative discussions.
- Wooclap: Enabled real-time idea pitching and audience voting.
- Wayground (formerly Quizizz): Turned concept reinforcement into an engaging, competitive game.
- Google NotebookLM: Acted as an AI thought partner for research, brainstorming, and ideation.
- Google AI Studio: Enabled participants to bring their ideas to life through AI-driven prototypes, the essence of Vibe Coding.

Together, these tools represented the entrepreneur's digital toolkit, demonstrating how AI can transform abstract ideas into viable innovations.

From Ideas to Entrepreneurial Prototypes

In the workshop's climax, teams developed mini-projects aimed at solving real challenges within education and campus life.

- The AI Study Buddy chatbot was envisioned as a personalised learning tutor that could be commercialised for Ghanaian universities.
- A mental health companion app used AI for student well-being, a potential social enterprise model.
- An adaptive quiz platform promised a scalable edtech solution for competency-based learning.

Each team pitched their prototype to peers in a startup-style showcase, earning votes through Wooclap. The top projects won Innovation Champion badges and mentoring opportunities for further incubation under the UNIHUBS framework.
"It felt like magic because we described what we wanted, and the AI started building it," one participant marveled. "For the first time, I felt like a creator, not just a consumer."

Reflections: Cultivating Entrepreneurial Educators

Post-event discussions on Canvas revealed the broader impact. Many educators admitted the workshop reshaped how they saw their role not merely as transmitters of knowledge, but as entrepreneurial facilitators of innovation.

"I'll integrate vibe coding and design thinking into my course," one lecturer wrote. "I want my students to start seeing problems as opportunities for innovation."

This emerging community of practice continues to share AI resources, entrepreneurial teaching methods, and prototype updates proving that the event has evolved into an ongoing innovation incubator.

Looking Ahead: Scaling Innovation for Entrepreneurship

Building on this success, KNUST plans to:

- Integrate AI-driven entrepreneurship modules into faculty training.
- Support prototype teams through mentorship and incubation partnerships.
- Develop a credit-bearing course titled "AI for Innovation and Entrepreneurship" under the UNIHUBS project.

In conclusion, the UNIHUBS Project HEI workshop at KNUST did more than teach a few cool tech tricks. It demonstrated a pedagogical innovation, showing how teaching and learning can evolve when we embrace new possibilities. The strong editorial takeaway is this: higher education is often criticised for being slow to change, but events like this offer a counternarrative of agility and optimism. As universities worldwide grapple with the challenge of AI, the experience in Ghana offers a case study in breaking barriers: mix bright minds with bold methods, add a dash of playfulness, and you just might accelerate learning into the future. In the words of one workshop participant, reflecting on the entire journey: "I came expecting to learn about AI. I left having reimagined what being an educator can mean." By embedding innovation-oriented pedagogy into curricula, KNUST aims to cultivate graduates who are not just employable but entrepreneurial.