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ADOPTING HYBRID TEACHING APPROACHES IN

COMMON COURSES IN ARCHITECTURAL AND

CIVIL ENGINEERING PROGRAMS

**Ms Qingyuan Yang**

**Lecturer, Wuxi Vocational Institute of Commerce, People’s Republic of China**

***Bachelor of Science (Construction Management)*, Jiangsu University, China**

***Master of Science (Project Management)*, the University of Manchester, UK**

**Abstract:** There is an urgent need for improvements in engineering education to ensure graduates are equipped with essential skills (Piyush, Mohamed & Gabriella, 2022). This paper suggests the utilization of hybrid teaching approaches in the design of common courses in Architectural and Civil Engineering (ACE) education. The ideas are applicable to other disciplines.

**Introduction**

Engineering education faces significant challenges in meeting rising expectations from students and employers seeking to develop innovative thinkers equipped with essential hard skills while cultivating soft skills valued in today's global economy (Jhonattan et al., 2021).

Common foundational courses are usually offered at the start of the curriculum in the field of civil engineering and architecture, especially at undergraduate level. They aim to provide students with fundamental skills that can be applied to different areas within all the related majors. Some examples include engineering drawing and computer software used in design and construction projects, which can be utilized for tasks such as 3D modelling, structural analysis, materials selection, or digital documentation. Furthermore, there are also some senior common courses like engineering project management which many majors require. Having similar classes allows for greater flexibility in terms of career paths, making it easier for graduates to explore both civil engineering and architecture professions after completing their bachelor’s degrees. It also fosters cross-disciplinary collaboration and mutual understanding between professionals working together on large infrastructure projects.

**Hybrid Teaching**

Hybrid teaching approaches refer to an instructional model that combines both traditional face-to-face teaching techniques with online learning tools and resources. This blended approach allows students to receive both synchronous and asynchronous interactions from professors and peers without being limited by time, location, or technology constraints. It takes advantage of multimedia tools and social networking technologies that extend student engagement and collaborative experiences beyond the traditional learning environment. The incorporation of digital media and dynamic assessment strategies enables innovative ways of evaluating knowledge acquisition, critical thinking abilities, research project design work, and leadership styles within vast communication streams increasing interest retention.

The integration of hybrid teaching methodologies into core civil and architectural engineering (ACE) undergraduate degree programs is one strategy aimed at improving overall student satisfaction and outcomes. The disciplines of ACE require a combination of theoretical concepts, technical skills, hands-on training, experiential learning, and problem-solving skills. Hybrid approaches provide various benefits for these fields.

**Adaptability to Technology**

Modern students have usually grown up with digital media technologies such as smartphones, tablets, laptops, and so on. Students expect learning materials to match their real lives and prefer interactive participation through various mediums. They want plenty of choice in where, when, and how they undertake formal learning activities. Thus, incorporating technology into education can make courses more engaging and stimulating.

* *Blending Traditional and Digital Learning Methods*: Architectural and civil engineering programs often have a significant amount of technical information to convey, including Building Information Modelling (BIM) software use, design principles, construction standards, etc. By using both traditional classroom methods and digital media such as videos, animations, simulations, virtual reality projects, and interactive applications, students can learn complex theories while gaining exposure to real-world problems. This format helps them develop 21st century skills crucial to succeed in their professions.
* *Time Management*: Hybrid models give students more control over how much time they spend in lectures compared to self-directed study. They also help reduce barriers associated with distance learning, allowing people who lack the flexibility to commit full-time on- campus schedules to continue working or attending family obligations while studying part- time.
* *Hands-On Training Combined with Theory*: As an applied field, construction project execution depends greatly on knowledge and understanding the industry processes needed to complete projects successfully, safety checks, risk analysis, equipment calibrations, building codes compliance, document review and site inspections. A hybrid model facilitates students' physical involvement in constructions projects along with constant online resources.

**An Example**

Take Engineering Drawing course for example, hybrid teaching approaches have improved the efficiency of teaching and learning according to the author’s teaching practice in Wuxi Vocational Institute of Commerce. Tasks of each class are sent to the students on E-learning platform before class. Students can download the task sheets and read before class, then attend the class with questions in mind. The software SketchUp helps create detailed three-dimensional models with accurate measurements when students have trouble in converting 2D drafts into 3D models during class. SketchUp provides interactive experiences where students can manipulate 3D models to gain a deeper understanding of spatial relationships. They can zoom, pan, rotate, add layers, and modify components to create various designs. Those 3D SketchUp models are uploaded to E-learning platform so that students can check them whenever they encounter any problems when doing assignments after class.

**Concluding Comments**

To summarize the narrative, the need for enhancing engineering education cannot be overemphasized. While traditional methods of imparting knowledge might have served us well in the past, they no longer suffice in preparing aspiring engineers for their professional responsibilities. Therefore, employing a hybrid approach with improved blending through adaptive learning analytics in the design of common courses can offer new perspectives in tackling conventional dilemmas.

**References**

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1. **\* These papers are for internal discussion within CESA on topics related to the CESA Mission.** [↑](#footnote-ref-1)