

Conclusion This study demonstrates that project-based learning, when intentionally designed, effectively develops communicative competence in technical university students. Rather than treating communication as an isolated curriculum component, PBL integrates communication development within authentic engineering work. Effect sizes are particularly pronounced for oral presentation skills, though meaningful gains occur across all dimensions. Future research should examine long-term workplace transfer and optimal curricular sequencing. The evidence strongly supports PBL as an effective strategy for bridging the gap between engineering education and professional communication requirements.

References

1. Helle, L., Tynjälä, P., & Olkinuora, E. (2006). Project-based learning in post-secondary education. *Higher Education*, 51(2), 287-314.
2. Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press.
3. Passow, H. J., & Passow, C. H. (2017). What competencies should undergraduate engineering programs emphasize? *Journal of Engineering Education*, 106(3), 475-526.
4. Riemer, M. J. (2007). Communication skills for the 21st century engineer. *Global Journal of Engineering Education*, 11(1), 89-100.
5. Strobel, J., & van Barneveld, A. (2009). When is PBL more effective? *Interdisciplinary Journal of Problem-Based Learning*, 3(1), 44-58.
6. Thomas, J. W. (2000). *A Review of Research on Project-Based Learning*. Autodesk Foundation.

DIRECTIONS OF THE COMPETENCY-BASED APPROACH TO THE TRAINING OF FUTURE SPECIALISTS

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Employers increasingly demand professionals who can apply knowledge flexibly, collaborate across boundaries, and continue learning throughout their careers. Traditional educational models, organized around disciplinary knowledge transmission,

have proven insufficient for developing these integrated capabilities. The competency-based approach emerged in response, reorienting curricula, pedagogy, and assessment around demonstrable outcomes—what graduates can actually do with what they know.

The competency-based approach integrates multiple theoretical traditions: behaviorism (observable, measurable outcomes), cognitive psychology (mental models and problem-solving strategies), constructivism (active engagement with authentic problems), and sociocultural theory (competence situated within communities of practice).

A "competence" is understood as an integrated capacity to mobilize knowledge, skills, attitudes, and values to address complex professional situations effectively and ethically. This holistic conception distinguishes competency-based education (CBE) from narrower skills-training models and aligns it with professional expertise development.

Principal Directions

From Content-Driven to Outcome-Oriented Curriculum Design The foundational direction reorients curriculum from inputs (content to be taught) to outcomes (what graduates will be able to do). Competencies are identified through consultation with employers, analysis of professional standards, and engagement with disciplinary bodies. They are articulated as clear, assessable learning outcomes. Content serves as a resource for competence development rather than an end itself, promoting constructive alignment between outcomes, teaching activities, and assessment tasks.

Integration of Generic and Specialized Competencies

A second direction involves systematically integrating generic (transferable) and specialized (discipline-specific) competencies. Communication, teamwork, critical thinking, ethical reasoning, and digital literacy are developed within professional education rather than treated separately. This occurs through embedding generic competencies within discipline-specific tasks, collaborative projects requiring both technical expertise and teamwork, and ethical analysis applied to authentic professional dilemmas. The objective is professionals who are technically proficient and capable of deploying expertise responsibly within complex contexts.

Active and Experiential Learning Methodologies

CBE requires pedagogical approaches enabling students to develop and demonstrate competencies in contexts approximating professional practice. Key strategies include problem-based and project-based learning, simulation and role-play, internships and work-integrated learning, and collaborative learning. These approaches share common features: active student engagement, tasks mirroring professional activities, frequent formative feedback, and structured reflection developing metacognitive awareness and self-regulated learning.

Authentic Assessment Systems Competency-based assessment evaluates integrated professional performance rather than fragmented knowledge recall. Authentic tasks—case analyses, design projects, client presentations, professional portfolios—require students to demonstrate competencies in contexts resembling practice. Criteria are explicitly articulated through rubrics describing competency levels. Multiple assessment points track development longitudinally. Self-assessment and peer assessment develop evaluative judgment essential for professional practice. The shift from norm-referenced to criterion-referenced assessment is fundamental.

Strengthening Education-Industry Partnerships CBE requires systematic collaboration with employers, professional bodies, and industry stakeholders. Partnership activities include collaborative competency identification, industry involvement in advisory boards, professional mentorship, industry-provided project briefs, workplace learning placements, and practitioner involvement in assessment. These partnerships ensure competencies align with evolving professional requirements and facilitate graduates' transition to employment.

Modular and Flexible Learning Pathways CBE supports modularization and flexible credentialing through recognition of prior learning, credit accumulation and transfer, stackable credentials, and personalized learning trajectories. Digital technologies increasingly enable adaptive learning platforms, competency-based progression systems, and e-portfolios documenting development across formal and informal contexts.

Implementation Considerations Successful CBE implementation requires substantial faculty development. Academics accustomed to content-centered teaching need support in articulating learning outcomes, designing active learning experiences, developing authentic assessments, and providing competency-oriented feedback. Institutional infrastructure—learning management systems supporting competency tracking, simulation facilities, workplace learning management systems—must align with CBE demands. Quality assurance frameworks oriented toward inputs require adaptation for outcomes-focused contexts, though accreditation standards increasingly emphasize graduate competencies.

Conclusion The competency-based approach represents a coherent direction for higher education reform. By reorienting curricula around demonstrable outcomes, integrating generic with specialized competencies, implementing active methodologies, developing authentic assessment, and strengthening industry partnerships, CBE addresses persistent concerns about graduate preparedness. Challenges in faculty development, infrastructure, and quality assurance are substantial but addressable. As professional practice grows more complex and interdisciplinary, developing integrated professional competence—rather than merely transmitting knowledge—becomes the defining characteristic of effective higher education.

References

1. Baartman, L. K. J., et al. (2007). Evaluating assessment quality in competence-based education. *Educational Research Review*, 2(2), 114-129.
2. Biggs, J., & Tang, C. (2011). *Teaching for Quality Learning at University* (4th ed.). Open University Press.
3. Mulder, M. (2014). Conceptions of professional competence. In S. Billett et al. (Eds.), *International Handbook of Research in Professional and Practice-Based Learning*. Springer.
4. Tuning Academy. (2020). *Tuning Educational Structures in Europe*. University of Deusto.

WAYS TO IMPROVE THE METHODOLOGY OF TRAINING CLASSES OF FUTURE OFFICERS USING INTERACTIVE EDUCATIONAL AND TRAINING COMPLEXES