INTEGRATIVE COMPETENCE-BASED MODEL FOR TEACHING TECHNOLOGY IN GENERAL SECONDARY SCHOOLS

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ANNOTATION:

The article presents an integrative competence-based model for teaching technology in general secondary schools. The model is organized around learning outcomes, interdisciplinary content, project-based practical activity and multi-criteria assessment. It emphasizes that technology teaching should develop learners' ability to analyse technological problems, design practical solutions and evaluate results responsibly.

INTRODUCTION

General secondary schools face the task of preparing learners for a world in which technological systems influence daily life, work and civic participation. Technology teaching therefore requires a competence-based model that goes beyond isolated craft operations and develops transferable technological reasoning. An integrative competence-based model is appropriate because technological activity is inherently interdisciplinary. A practical product involves measurement, material behaviour, digital representation, ecological impact, cost estimation and user needs. These elements should be united within the pedagogical structure of the lesson.

The article aims to formulate a model that can guide the design of technology lessons in general secondary schools and support systematic development of technological competence.

METHODS

The model was developed through theoretical synthesis of competence-based education, project-based learning, technological literacy standards and reflective assessment. Pedagogical modelling was used to determine the internal structure of the model and the relationships among its components. The model includes six interconnected elements: target outcome, content integration, problem-based task, project activity, teacher support and assessment-reflection. Each element has a specific function and cannot be replaced by a formal instructional procedure.

Validity of the model was considered from a conceptual perspective. The model is coherent if each element contributes to the intended competence outcome and if assessment measures the same components that were developed during learning.

RESULTS

The target outcome of the model is the formation of a student who can understand a technological problem, select relevant information, design a feasible solution, produce a practical result and evaluate the process. This outcome integrates knowledge, skills, attitudes and responsibility. Content integration operates through thematic clusters. For instance, a task related to designing a useful object may include mathematical measurement, material science, digital drawing, environmental responsibility and presentation skills. The cluster is not an artificial combination of topics. It is determined by the logic of the practical problem.

Project activity forms the core of the model. Learners move from problem analysis to product development. They document decisions, compare alternatives, follow safety requirements and present the final result. The teacher provides scaffolding rather than replacing learner decision making.Assessment is organized through criteria. The model recommends criteria for conceptual understanding, design planning, practical implementation, collaboration and reflection. These criteria allow the teacher to evaluate both product and process.

DISCUSSION

The model is significant because it prevents the reduction of competence-based teaching to rhetorical language. Competence becomes visible only when a learner performs meaningful actions under conditions that require choice and justification. Technology lessons can provide these conditions better than many purely theoretical subjects. The model also clarifies the role of digital tools. Digital representation, simulation or documentation should support the project cycle. When digital tools are used merely for decoration, they do not contribute to competence. When they help learners model, calculate, present and reflect, they become part of integrative learning.

Implementation requires careful teacher preparation. Teachers should be able to design interdisciplinary tasks, manage group work, ensure safety and conduct multi-criteria assessment. Without such preparation, the model may be simplified into isolated activities.The proposed model is adaptable to different grades and school contexts. Its structure remains stable, while tasks, materials and expected levels can be adjusted according to age and available resources.

A competence-based model should not be confused with a collection of active methods. Active learning becomes competence-oriented only when activity requires purposeful decision making and assessment captures the quality of that decision. The model therefore links activity with criteria.In general secondary schools, adaptability is essential. Technology classrooms may differ in equipment, teacher experience and learner readiness.

The model is designed as a flexible framework: its blocks remain constant while materials, task complexity and expected independence vary.

Content integration is not a curriculum overload. Instead of adding separate theoretical sections, the model places knowledge inside the project cycle. Students learn measurement while designing, safety while operating, ecological responsibility while selecting resources and communication while presenting results.Teacher support plays a regulatory role. Students require freedom to choose, but that freedom must be safe and educationally productive. The teacher's questions, feedback and mini-consultations keep the project aligned with competence outcomes.

The model can be implemented through short micro-projects or longer thematic projects. A short task may last one lesson and focus on a simple design challenge. A longer task may include research, prototype development and public presentation. Both formats remain valid if the competence logic is preserved. The final value of the model lies in its diagnostic transparency. Learners, teachers and researchers can see which dimension of competence is being developed and how progress will be evaluated.

CONCLUSION

The integrative competence-based model provides a coherent framework for teaching technology in general secondary schools. It connects outcomes, content, project activity and assessment in a way that supports technological competence development. Further research should develop diagnostic instruments for each component of the model and test its effectiveness through pedagogical experiment.

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