INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 16, Issue 3, (2026) E-ISSN: 2222-6990

Epistemological Orientation and Informal Professional Learning in Supporting Industry-Aligned Competency Curriculum in TVET

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DOI Link: http://dx.doi.org/10.6007/IJARBSS/v16-i3/27842

Published Date: 23 March 2026

Abstract

The transformation of Technical and Vocational Education and Training (TVET) has increasingly emphasised competency-based curricula aligned with industrial practices. Within this transformation, lecturers play a crucial role in mediating knowledge between educational institutions and industry environments. This study explores how lecturers' epistemological orientations and informal professional learning influence the implementation of industry-aligned competency curriculum in vocational colleges. A qualitative research design was employed using semi-structured interviews with TVET lecturers from technology-based programmes. The data were analysed using thematic analysis. The findings reveal three interconnected dimensions shaping lecturers' professional practices: epistemological beliefs about knowledge, informal professional learning mechanisms, and the implementation of industry-driven curriculum transformation. Lecturers generally perceive knowledge as dynamic, contextual, and continuously evolving alongside technological change. Informal learning activities such as peer collaboration, industry engagement, digital learning, and experiential reflection play an important role in supporting lecturers' professional development. These learning processes enable lecturers to adapt teaching approaches and implement competency-based curriculum through project-based learning and industry simulations. The study suggests that effective curriculum transformation in TVET depends not only on institutional policies but also on lecturers' epistemological orientations and continuous professional learning practices. These findings contribute to a deeper understanding of how educators negotiate knowledge and curriculum implementation within contemporary vocational education reforms.

Keywords: TVET Lecturers, Epistemological Beliefs, Informal Learning, Curriculum Transformation, Competency-Based Education

Introduction

Technical and Vocational Education and Training (TVET) has become increasingly important in addressing workforce development and economic transformation in many countries. Rapid technological advancement, industrial digitalisation, and the emergence of Industry 4.0 have significantly reshaped the competencies required in contemporary labour markets. As a result, vocational education systems worldwide are undergoing substantial reforms aimed at aligning training programmes with industry demands and preparing graduates with relevant technical competencies (OECD, 2023) (UNESCO-UNEVOC, 2022).

One of the most prominent shifts in TVET reform is the transition from traditional content-based curricula towards competency-based education frameworks. Competency-based approaches emphasise the development of practical skills, workplace problem-solving abilities, and authentic learning experiences that mirror real industrial practices (Wheelahan & Moodie, 2022). These reforms aim to reduce the gap between institutional training and the dynamic requirements of modern industries.

In this regard, empirical evidence also highlights that improving curriculum quality in technical and vocational education requires more than restructuring technical content alone. Curriculum development should integrate soft skills, humanistic elements, digital learning approaches, and entrepreneurship-oriented education to enhance graduates' readiness for industry (Zamri, Ahyan, Noh@ Seth, Pairan, & Jambari, 2023). This suggests that contemporary TVET curricula must be designed holistically to address both technical and non-technical competencies required in evolving labour markets.

However, implementing competency-based curricula involves more than structural policy changes or curriculum redesign. The effectiveness of curriculum transformation largely depends on how educators interpret and enact these reforms within their teaching practices. Lecturers play a crucial role in translating curriculum frameworks into meaningful learning experiences that connect theoretical knowledge with practical workplace applications. Consequently, understanding how educators conceptualise knowledge and adapt their professional practices becomes essential for understanding how curriculum reforms are implemented in practice.

Within the social sciences, growing scholarly attention has been given to the role of epistemological beliefs in shaping educational practices. Epistemological beliefs refer to individuals' conceptions about the nature of knowledge and how knowledge is constructed, validated, and applied (Hofer & Pintrich, 2020). These beliefs influence how educators interpret curriculum content, evaluate knowledge sources, and design learning activities that facilitate students' understanding. In vocational education contexts, where knowledge is closely linked to occupational practice, educators' epistemological orientations may significantly shape the ways in which knowledge is translated into teaching and learning processes.

Vocational knowledge differs from traditional academic knowledge in several important ways. While academic disciplines often emphasise theoretical abstraction, vocational knowledge is closely tied to practical application and workplace contexts. Billett (2021) argues that vocational knowledge is inherently situated and develops through

interaction between conceptual understanding and practical engagement in occupational environments. Therefore, vocational educators must continuously reinterpret knowledge in relation to evolving technologies and industrial practices.

Recent empirical studies have highlighted the growing importance of educators' professional learning in responding to these transformations. Informal learning, in particular, has been identified as a key mechanism supporting educators' professional development. Informal professional learning occurs through everyday work practices such as collaboration with colleagues, participation in professional networks, reflection on teaching experiences, and engagement with digital learning environments (Eraut, 2020) (Kyndt, Govaerts, Vermeire, & Dochy, 2021). Such learning processes enable educators to update their knowledge, experiment with new teaching approaches, and adapt their pedagogical practices to technological and curricular changes.

Recent empirical studies highlight the increasing importance of industry collaboration and practice-based learning in vocational education systems (Billett, Choy, & Hodge, Enhancing learning through practice-based experiences in vocational education and training, 2022) (OECD, 2023). These studies demonstrate that closer engagement between educational institutions and industry partners is essential to ensure that vocational curricula remain aligned with evolving workplace practices. These interactions help ensure that vocational training programmes remain relevant to contemporary labour market demands.

Despite these developments, existing research has primarily focused on institutional reforms, policy frameworks, and industry partnerships in vocational education. Comparatively limited attention has been given to how lecturers' epistemological orientations influence their interpretation of knowledge and their engagement in professional learning practices within the context of industry-driven curriculum transformation. In particular, there remains a need to understand how educators' beliefs about knowledge interact with informal professional learning experiences to shape curriculum implementation in vocational education settings.

Addressing this gap is important because curriculum reforms cannot be fully understood without examining how educators interpret knowledge and adapt their teaching practices within evolving institutional and industrial environments. Lecturers are not merely implementers of curriculum policies; they are active mediators who interpret, contextualise, and translate knowledge into pedagogical practices that prepare students for professional work.

Therefore, this study aims to explore how TVET lecturers' epistemological beliefs and informal professional learning practices influence the implementation of industry-aligned competency-based curriculum in vocational education institutions. By examining these relationships, the study contributes to ongoing debates in the social sciences concerning knowledge construction, professional learning, and curriculum transformation in contemporary vocational education systems.

Literature Review

Epistemological Beliefs in Vocational Education

Epistemological beliefs refer to individuals' conceptions about the nature of knowledge and the processes through which knowledge is constructed and validated. These beliefs influence how educators interpret knowledge sources, evaluate the credibility of information, and design learning environments that support knowledge acquisition (Hofer & Pintrich, 2020). In educational contexts, epistemological beliefs have been shown to shape teaching strategies, learning expectations, and assessment practices.

Within Technical and Vocational Education and Training (TVET), epistemological beliefs hold particular significance due to the nature of vocational knowledge. Unlike traditional academic disciplines that often emphasise theoretical abstraction, vocational knowledge is closely associated with practical application and workplace practices. According to Billett (2021), vocational knowledge is inherently situated and develops through the interaction between theoretical understanding and occupational practice. Consequently, educators in vocational settings must continuously reinterpret knowledge in relation to evolving industrial technologies and professional practices.

Recent studies suggest that educators who perceive knowledge as dynamic and contextual are more likely to adopt pedagogical approaches that emphasise inquiry-based learning, problem-solving, and experiential learning (Winch, 2020). Such epistemological orientations encourage educators to move beyond rote instruction towards teaching strategies that emphasise conceptual understanding and authentic problem-solving. In vocational education, this perspective allows students to connect theoretical concepts with practical workplace applications.

Moreover, epistemological beliefs also influence how educators evaluate the relevance of curriculum content. In rapidly evolving technological fields, knowledge becomes obsolete quickly if it is not continuously updated in accordance with industry developments. Therefore, vocational educators often rely on industry feedback, professional networks, and workplace experiences to assess the relevance of knowledge used in teaching (Guile & Unwin, 2022). These epistemological perspectives position lecturers not merely as transmitters of knowledge but as mediators who interpret and contextualise knowledge within real occupational environments.

Informal Professional Learning

Professional learning among educators increasingly extends beyond formal training programmes. Informal learning refers to unstructured learning processes that occur naturally through everyday professional activities such as collaboration, observation, reflection, and engagement with professional communities (Eraut, 2020). Unlike formal professional development programmes, informal learning is often self-directed and embedded within workplace practices.

In the context of vocational education, informal learning plays a crucial role in enabling lecturers to remain updated with technological developments and industry standards. Due to the rapid pace of industrial innovation, lecturers often acquire new knowledge through

collaboration with colleagues, participation in industry networks, and engagement with digital learning resources (Kyndt, Govaerts, Vermeire, & Dochy, 2021).

Peer collaboration is frequently identified as one of the most important mechanisms of informal learning. Through mentoring relationships, collaborative teaching, and knowledge sharing among colleagues, educators exchange professional experiences and develop innovative teaching practices. Such collaborative learning environments foster the development of professional learning communities that support continuous improvement in teaching practice.

Digital learning environments also contribute significantly to lecturers' professional development. Online courses, webinars, professional forums, and virtual communities provide opportunities for educators to access updated knowledge and learn about emerging technological trends. These digital platforms enable lecturers to continuously develop their professional competence and adapt teaching strategies to changing industry requirements.

Industry engagement further strengthens informal professional learning among vocational educators. Interaction with industry professionals provides lecturers with direct exposure to contemporary workplace practices, technological tools, and professional standards. Such engagement enables educators to bridge the gap between institutional training and industry expectations.

Industry-Driven Curriculum Transformation

In recent decades, TVET systems worldwide have undergone significant reforms aimed at improving the alignment between vocational training and labour market needs. These reforms often involve the adoption of competency-based curricula, increased industry participation in curriculum development, and the integration of authentic learning environments that reflect workplace practices (OECD, 2023).

Competency-based education focuses on developing students' ability to perform specific tasks and responsibilities required in professional contexts. Rather than emphasising theoretical knowledge alone, competency-based approaches integrate technical skills, problem-solving abilities, and professional attitudes required in the workplace (Wheelahan & Moodie, 2022).

Industry collaboration plays a critical role in ensuring that vocational training remains relevant and responsive to technological change. Industry partners contribute to curriculum design, competency standard development, and workplace training opportunities. Through these partnerships, educational institutions gain insights into emerging technologies and evolving occupational requirements.

Project-based learning and simulation-based training are frequently used as pedagogical approaches to support competency development. These approaches allow students to engage with real-world problems and develop practical solutions using industry-relevant tools and technologies.

Despite these reforms, the implementation of industry-aligned curricula remains dependent on educators who translate policy frameworks into classroom practice. Lecturers must interpret competency standards, design learning activities aligned with industry expectations, and evaluate students' practical performance. Therefore, understanding how lecturers' beliefs and professional learning experiences influence curriculum implementation is essential for strengthening TVET reforms.

Methodology

Research Design

This study employed a qualitative research design to explore lecturers' perspectives on epistemological beliefs, informal professional learning, and curriculum transformation in vocational education. Qualitative methods were selected because they allow researchers to explore participants' experiences, interpretations, and professional practices in depth.

Participants

Participants consisted of lecturers teaching technology-based programmes in vocational colleges. These lecturers were selected because they were directly involved in implementing competency-based curricula and had experience engaging with industry partners.

Data Collection

Data were collected through semi-structured interviews. The interview protocol included questions related to:

- Lecturers' understanding of knowledge in vocational education
- Professional learning experiences
- Teaching practices
- Experiences implementing competency-based curriculum

Semi-structured interviews allowed participants to share their experiences while enabling the researcher to explore emerging issues in greater detail.

Data Analysis

The interview data were analysed using thematic analysis. The analysis followed several stages:

(1) Familiarisation with the data
(2) Initial coding of meaningful segments
(3) Identification of patterns and categories
(4) Development of overarching themes
(5) Interpretation of relationships among themes

Through this process, three major themes emerged describing lecturers' epistemological perspectives, informal professional learning practices, and curriculum transformation experiences.

Findings

Table 1

Major Themes and Sub-Themes from the Qualitative Analysis

Theme	Sub-theme
Epistemological Beliefs of TVET Lecturers	Knowledge as contextual and evolving; epistemology guiding teaching approaches; lecturers as knowledge mediators.
Informal Professional Learning	Peer collaboration; experiential learning; digital self-learning; industry exposure
Industry-Driven Curriculum Transformation	Competency-based assessment; project-based learning; industry collaboration; curriculum adaptation

The findings indicate that lecturers generally perceive knowledge in vocational education as dynamic and continuously evolving. Knowledge is viewed as something that must be validated through application and industry relevance rather than being treated as fixed theoretical content.

Participants emphasised that teaching should not focus solely on memorisation of technical information. Instead, learning activities should encourage students to understand how knowledge can be applied in real workplace contexts. Lecturers frequently highlighted the importance of helping students develop practical reasoning skills that allow them to interpret technological problems and propose appropriate solutions.

Another important finding concerns the perceived role of lecturers as mediators between academic knowledge and industry practices. Participants explained that their responsibility involves translating theoretical concepts into forms that are meaningful for students preparing to enter technical professions.

Informal learning emerged as a significant mechanism supporting lecturers' professional development. Participants reported that much of their learning occurs outside formal professional development programmes.

Peer collaboration was identified as one of the most important sources of professional learning. Lecturers frequently exchange teaching ideas, discuss classroom challenges, and observe colleagues' teaching practices. Such interactions enable lecturers to reflect on their teaching strategies and adopt new approaches.

Participants also described experiential learning as an important aspect of professional development. Through experimentation with new teaching methods, lecturers continuously refine their instructional practices.

Digital learning platforms were also widely used. Online courses, technical forums, and professional webinars provide opportunities for lecturers to update their knowledge and learn about emerging technologies.

Industry engagement further strengthens lecturers' professional competence by exposing them to real workplace practices.

Conceptual Model

The conceptual model developed from the findings illustrates the relationship between lecturers' epistemological beliefs, informal professional learning, and curriculum implementation.

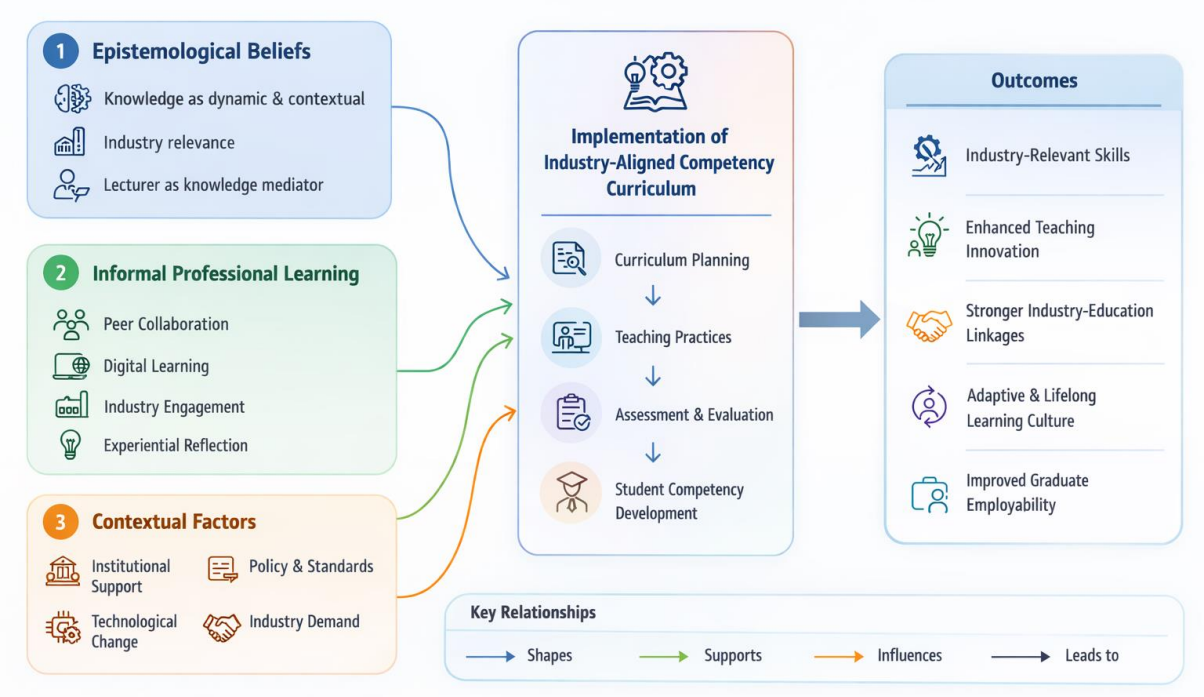

Figure 1 Conceptual Model: Epistemological Beliefs, Informal Learning and Industry-Aligned Competency Curriculum

The model suggests that lecturers' beliefs about knowledge shape their teaching approaches, while informal professional learning provides opportunities for lecturers to update their knowledge and refine teaching practices. Together, these factors influence how competency-based curriculum is implemented in vocational education.

Discussion

The findings highlight the importance of epistemological beliefs in shaping lecturers' teaching practices. When lecturers perceive knowledge as evolving and context-dependent, they tend to adopt teaching strategies that emphasise application and problem-solving. This perspective aligns with previous research suggesting that vocational knowledge is closely linked to workplace practice (Billett, Vocational education: Purposes, traditions and prospects, 2021).

The study also demonstrates that informal professional learning plays a crucial role in supporting lecturers' professional development. Informal learning allows lecturers to continuously update their knowledge and adapt teaching practices in response to technological change.

Furthermore, the findings emphasise the importance of industry collaboration in curriculum transformation. Industry engagement enables lecturers to understand current workplace practices and incorporate relevant knowledge into teaching activities.

Overall, the study suggests that curriculum transformation in TVET is shaped not only by policy reforms but also by lecturers' beliefs, professional learning experiences, and interactions with industry stakeholders.

Conclusion

This study examined how lecturers' epistemological beliefs and informal professional learning influence the implementation of industry-aligned competency curriculum in vocational education.

The findings demonstrate that lecturers who perceive knowledge as dynamic and contextual are more likely to adopt teaching approaches that emphasise practical application and industry relevance. Informal professional learning activities such as peer collaboration, digital learning, and industry engagement further support lecturers in adapting their teaching practices.

The study highlights the importance of strengthening professional learning opportunities for vocational educators and enhancing collaboration between educational institutions and industry partners. Such initiatives may contribute to more effective implementation of competency-based curricula and improved alignment between vocational education and labour market needs.

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