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Assessing Knowledge Management Strategies for Commercialisation at Mutare Polytechnic in Zimbabwe

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Abstract

Rationale of the Study: This paper investigates knowledge management strategies for commercialisation at one Polytechnic in Mutare District, addressing the challenge of unrealised commercial benefits from knowledge outputs that could contribute to national GDP.

Methodology: The study employed a qualitative approach, using a quota sampling technique to select 12 lecturers and 3 administrators. Face-to-face interviews were conducted to gather data.

Findings: Results show that lecturers and administrators have a limited understanding of Knowledge Management (KM) strategies and practices, leading to inefficiencies and missed opportunities. KM practices at the institution are not well-coordinated.

Implications: The study recommends that the institution provide training programs to enhance staff and students' understanding of KM strategies and develop clear KM and IP policies to ensure a coherent approach to knowledge creation, management, and commercialisation.

Originality: Beyond the Zimbabwean case, the study situates polytechnic commercialisation within global debates on knowledge economies, innovation ecosystems, and the role of technical and vocational institutions in driving entrepreneurship. This makes the findings relevant to policymakers, academics, and practitioners across Africa and other developing regions facing similar challenges of underutilised knowledge outputs.

Keywords

Commercialisation, Knowledge management, Polytechnics, Zimbabwe

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1 Introduction

Academic institutions have been adjusting to environmental forces, not just to continue imparting skills but also to establish business entities and generate revenue. In Zimbabwe, academic institutions have been continuously challenged to set up companies in which they are major shareholders, not just to display knowledge products at international fairs, then shelve the products without giving the institutions any commercial value. This new entrepreneurial or commercial approach of these institutions, particularly polytechnics, requires rethinking and a systematic approach that would take them to a higher level and enable them to survive in the business environment. Polytechnics and/or Technical and Vocational Education Training (TVET) are established in a way that they could be run both as training institutions and business entities, through systematic, continuous production of products and commercialisation of knowledge products that are created during training, research symposiums and other fora (Radko et al., 2023).

Commercialisation has become a topical issue in these institutions, where others argue that they could just remain as they have been, just producing graduates without much commercial gain. Every polytechnic or TVET institution contributes to knowledge creation (Kiberenge et al., 2023). The generated knowledge should be continuously improved to enhance the competitive and commercial advantage of these institutions and to address community problems. However, most of the knowledge generated in polytechnics is not properly captured and remains unknown to the public, thereby creating a significant vacuum and preventing future generations from learning from what already exists. Asiedu et al. (2022) highlighted that knowledge produced in academic institutions remains as grey literature. Yet KM provides the basis for others to learn from and possibly develop something new or add on to already existing knowledge products. Khatun et al. (2021) noted that knowledge builds on knowledge, and past events help generate new knowledge, enabling future generations to continually refer to and improve upon it. Creating knowledge without managing it is a waste of institutional resources. As alluded to earlier, the next generations may likely reproduce previously produced knowledge products, viewing them as new inventions and having nowhere to refer to. This creates a serious need for proper management of knowledge generated within polytechnics, as well as strategies that promote the systematic commercialisation of these products to enhance their competitive and commercial advantage. Asiedu et al. (2022) added that KM strategies provide a basis for others to learn from, possibly develop and add new ideas to, or build upon available knowledge. The intellectual output in polytechnics warrants deliberate, coordinated

effort to establish KM strategies that drive commercialisation.

The Mutare Polytechnic, in Mutare District, Zimbabwe, has extensive knowledge, as evidenced by its skilled and experienced employees, students and staff, research output, research prototypes, exhibitions at local and international fairs, and awards won over the years. These products, if managed and used effectively, may give the institution a competitive advantage and commercial gains. However, soon after the exhibitions, award wins, and research project completions, the products are shelved or forgotten, but the institution may gain significant visibility and commercial advantage if these knowledge products are banked, improved, and commercialised.

In recent years, it has been argued that power comes from sharing knowledge, making it productive, and not from hiding it. This calls for deliberate KM strategies to ensure that knowledge is created, stored, shared, and used to achieve competitive and commercial gains (Jones & Dodla, 2023). Knowledge management in education systems is not something new. Various studies were conducted in this area. Asiedu et al. (2022) conducted a systematic review that highlighted that KM is a popular concept among institutions of higher learning, but the reviewed literature indicates that it is more practised by corporate entities than by such institutions. Munyoro et al. (2022) noted that research on KM in Zimbabwe, particularly in academic institutions, was limited. Their findings revealed that there was limited research on KM in Zimbabwe; strikingly, though, few studies examined KM in polytechnics or in any technical and vocational context. Thornhill-Miller et al. (2023 contend that institutions of higher learning will always be creators of knowledge, as they equip new generations with the skills, cultural and scientific literacy, flexibility, and capacity for critical inquiry to contribute to society. Vidic (2022) concluded that the organisations that can identify, value, create and evolve their knowledge assets are likely to be more successful than those that do not. This calls for deliberate efforts to establish KM strategies leading to commercialisation in polytechnics. The result of KM strategies is growth in institutional innovation, as this increases creativity among staff, who know that their intellectual output will contribute to society and will also yield commercial gains.

Onofre and Teixeira (2022) highlighted that knowledge is today more than ever the most critical resource of organisations. However, it is the least-accessible resource; it is difficult to share, imitate, buy, sell, store, or evaluate, as Bragge and Kivijärvi (2011) noted. Organisations should thus have explicit strategies for managing their knowledge resources. Jones and Dodla (2023) reiterated that the application of KM strategies helps

determine how an organisation manages knowledge, data, and information for competitive advantage. Organisations should first strive to gain insights into knowledge management and its importance, then set strategies to position it competitively above all competitors.

2 Context and Rationale

Globally, higher education institutions are increasingly expected to contribute not only to teaching and research but also to innovation and commercialisation. The knowledge problem lies in the persistent gap between knowledge creation and its translation into socio-economic value. Existing literature is largely descriptive, focusing on KM practices without adequately addressing the knowledge gaps in polytechnics and TVET institutions. Most studies emphasise corporate KM, leaving academic institutions underexplored (Asiedu et al., 2022; Munyoro et al., 2022). This study bridges that gap by situating KM within the commercialisation agenda of polytechnics and highlighting the missed opportunities to transform intellectual outputs into marketable products. This study addresses that gap by examining how polytechnics, as hybrid institutions of training and production, can leverage knowledge management (KM) strategies for commercialisation. The Mutare Polytechnic serves as a microcosm of the challenges faced by polytechnics in Africa and beyond. This raises critical questions about institutional capacity, KM strategies, and policy frameworks that resonate with global debates on innovation and entrepreneurship in education.

The following research questions guided the study:

a) What is the level of staff awareness of Knowledge Management (KM) at Mutare Polytechnic?
b) What KM strategies are currently in use at the institution?
c) What infrastructural gaps affect the implementation of KM?
d) What factors enable or hinder the commercialisation of knowledge?

3 Literature Review

The literature was reviewed based on the research objective:

3.1 Knowledge management

In today's knowledge-driven economy, effective knowledge management (KM) is widely recognised as a cornerstone of competitiveness and institutional growth (Mohammed et al., 2023). KM provides a systematic framework for capturing, sharing, and leveraging knowledge, thereby enhancing teaching, learning, and organisational performance. Scholars such as Al-Emran et al. (2020) and Usman et al. (2021) argue that KM directly impacts organisational success, linking it to value creation and improved living standards. While this broad consensus underscores KM's importance, much of the literature remains focused on corporate

contexts, where KM is tied to profit maximisation and efficiency. Studies in academic institutions (Abou-Moghli, 2025; Areed et al., 2021; Suparwadi et al., 2024) highlight KM's potential to drive innovation and excellence, but they often stop short of examining how knowledge outputs can be systematically commercialised. This gap is critical, as institutions like polytechnics generate significant intellectual capital yet struggle to translate it into economic value.

3.2 Staff Understanding of KM strategies in polytechnics

The literature consistently points to limited awareness and inconsistent implementation of KM in higher education (Nawaz & Gomes, 2020; Nawe, 2015). KM is often absent from pedagogical frameworks, despite its relevance to education (Barboza et al., 2020). Studies show that staff and students are rarely sensitised to the value of KM, resulting in fragmented practices and missed opportunities for commercialisation (Trovarelli et al., 2022). In African polytechnics, Mostofa (2024) notes that KM knowledge is particularly limited, with Nawe (2015) finding that over half of respondents were unaware of KM activities at their institutions. This lack of awareness is not simply a communication issue; it reflects deeper institutional neglect of KM as a strategic priority. The literature therefore underscores the need for deliberate efforts to build KM capacity among staff, ensuring that knowledge is recognised as a vital asset and systematically harnessed for innovation and commercialisation.

3.3 Knowledge management strategies

KM strategies are typically framed as deliberate plans for managing information and knowledge to benefit organisations and stakeholders (González-Ramos et al., 2023). Codification and personalisation are the two dominant approaches, with codification emphasising documentation and repositories, and personalisation focusing on the exchange of tacit knowledge through mentoring, collaboration, and communities of practice (Wanigasekara et al., 2022). Asiedu et al. (2022) stress that successful KM strategies require institutions to understand the roles and functions of knowledge, yet many academic institutions lack coherent frameworks. While the literature identifies multiple strategies—creation, sharing, exploitation—the emphasis remains on knowledge circulation rather than its transformation into commercial products. This reveals a conceptual gap: KM strategies are discussed as tools for organisational learning and efficiency, but rarely as mechanisms for wealth creation in education. The current study addresses this by examining how codification and personalisation strategies can be leveraged for commercialisation in a polytechnic setting.

3.4 Barriers to KM strategy implementation

Several studies highlight barriers to KM implementation, including poor

communication, lack of trust, behavioural resistance, limited resources, and technological constraints (Lawrence & Santhose, 2023). Quarchioni et al. (2022) add that there is little understanding of how KM interacts with institutional dynamics in higher education. Much of the literature has focused on libraries and codified knowledge (Azzahrawaani & Ikrimah, 2024), leaving commercialisation largely unexplored. In the African context, Asiedu et al. (2022) identify a notable gap in KM research, with few studies examining how institutions can move beyond knowledge storage to knowledge exploitation. The lack of awareness of intellectual property further compounds these challenges, as institutions fail to protect and monetise their outputs. These barriers highlight the systemic weaknesses that prevent polytechnics from realising the economic potential of their intellectual capital.

4 Theoretical Foundations

This study is grounded in the Knowledge-Based View of the Firm (KBV), which positions knowledge as the most strategically significant resource for organisational competitiveness and long-term survival (Grant, 1996; Spender, 1996). KBV highlights that institution**s** such as polytechnics, which are inherently knowledge-intensive, can achieve commercialisation outcomes by effectively managing and leveraging their intellectual capital. Complementing KBV, the Innovation Systems Theory provides a framework for understanding how institutions, policies, and networks interact to foster innovation. It emphasises that innovation does not occur in isolation but within systems shaped by linkages between education, industry, and government (Lundvall, 1992; Nelson, 1993). For Mutare Polytechnic, this theory underscores the importance of building collaborative ecosystems that connect research outputs to industry needs and national development priorities. The Triple Helix Model (Etzkowitz & Leydesdorff, 2000) further enriches this perspective by highlighting the dynamic interactions between universities (or polytechnics), industry, and government in driving innovation. It suggests that sustainable commercialisation requires strong partnerships across these three spheres. In the Zimbabwean context, weak industry collaboration and fragmented policy frameworks limit the effectiveness of KM strategies. The Triple Helix Model frames these gaps as systemic issues that must be addressed to unlock the full commercial potential of polytechnics.

Together, KBV, Innovation Systems Theory, and the Triple Helix Model provide a theoretical foundation for this study. KBV explains the centrality of knowledge assets, Innovation Systems Theory situates commercialisation within broader institutional and policy ecosystems, and the Triple Helix Model highlights the collaborative dynamics

necessary for innovation. These frameworks ensure that the Zimbabwean case is not viewed in isolation but as part of global debates on knowledge economies, innovation systems, and institutional entrepreneurship.

5 Methodology

This study adopted a qualitative case study design to explore how knowledge management (KM) strategies support commercialisation at Mutare Polytechnic. A qualitative approach was chosen because it allows for rich, contextual insights into institutional practices, perceptions, and challenges. Rather than relying on numbers or broad surveys, the study sought to capture lived experiences and nuanced understandings of how staff engage with KM in their daily work.

The Polytechnic in Mutare District was selected as the case because it represents the realities faced by many polytechnics in Zimbabwe and across Africa. As a knowledge-intensive institution, it produces research outputs, prototypes, and innovations, yet struggles to translate these into commercial value. Studying this institution, therefore, offers lessons that extend beyond Zimbabwe, providing insights relevant to other developing regions grappling with similar challenges.

Fifteen participants were involved in the study, comprising three administrators and twelve lecturers. These lecturers had extensive teaching experience, ranging from 10 to 30 years, which provided depth of perspective on institutional practices. Participants were selected through quota and purposive sampling to ensure that both administrative and academic voices were represented.

Data were collected through unstructured interviews. This format was deliberately chosen to allow flexibility and adaptability, enabling participants to share their experiences in their own words. The interviews created space for deeper exploration of perceptions, challenges, and opportunities around KM and commercialisation.

Ethical considerations were central to the research process. Participants were fully informed about the aims of the study, assured of confidentiality, and reminded that their participation was voluntary. Efforts were made to create a comfortable environment for discussion, and participants were encouraged to raise any concerns or discomfort with the research techniques or questions. Approval to conduct the study was obtained from the Tertiary Education Service Council, thereby ensuring compliance with institutional and national research ethics requirements.

Data analysis followed a systematic and iterative process. Interview transcripts were read multiple times, annotated, and coded in NVivo. An inductive coding approach was employed, allowing themes to emerge directly from the data rather than being imposed beforehand. Codes were refined into

categories, which were then developed into broader themes. This iterative process ensured that the analysis remained faithful to participants' experiences while also identifying underlying patterns and relationships. Content analysis was used to interpret the data, with the researcher continually revisiting and revising categories to ensure accuracy and coherence.

6 Findings

This section presents the findings from interviews, organised according to five main themes derived through thematic analysis using NVivo:

a) Knowledge deficit in KM
b) Informal and unstructured KM strategies, practices or fragmented implementation
c) Systemic gaps in infrastructure
d) Enablers of commercialisation
e) Challenges or barriers to the commercialisation of knowledge products

This study involved 15 participants, comprising 3 administrators and 12 lecturers from the Polytechnic under review. To maintain anonymity and confidentiality, each participant was assigned a unique code.

Coding Structure:

- Administrators: A_1 to A_3 (3 participants)
- Lecturers: Lect_1 to Lect_12 (12 participants)

This coding structure was used to present the study's data and findings, ensuring that participant responses were accurately attributed and analysed.

6.1 Knowledge deficit in KM

Objective number one sought to assess staff knowledge of KM strategies that could bring competitive advantage and commercial gains to the institution and individuals. This study revealed that KM knowledge is critical to the success of product commercialisation in polytechnics. At the institution under review, participants lacked awareness and training in KM principles, leading to misunderstandings and poor implementation.

Across all interviews, participants revealed a limited understanding of KM. Most participants had a limited understanding of KM and could not define or describe KM strategies. For instance, one participant, InteL_3, noted, "*It can be plagiarised*," indicating a fundamental misunderstanding of KM concepts. This deficit impairs the institution's ability to manage, share, or protect knowledge effectively. In contrast, a participant from Japan shared insights from a structured KM curriculum, suggesting that cultural and educational backgrounds significantly impact KM awareness.

> InteL_5 noted, "*The collection of wisdom that is difficult to visualise, such as skilled techniques, is called tacit knowledge, and I believe that the main issue of knowledge is for*

> *the world and the next generation. A virtuous knowledge society can be created by visualising that tacit knowledge as explicit knowledge that can be learned systemically."*

The study established effective KM strategies that lead to commercialisation. These strategies included codification and personalisation, as well as some derived from the Socialisation, Externalisation, Combination and Internalisation (SECI) model and the Knowledge Management Enabler Framework (KMEF). Farnese et al. (2019) added that the SECI model enables monitoring of an organisation's competence in managing new knowledge and in detecting the strengths/weaknesses of KM-related policies and programs. Mostofa (2024) highlighted that the Knowledge Management Enabler Framework (KMEF) emphasises creating an atmosphere that fosters readiness for knowledge sharing, enabling employees to share their tacit knowledge willingly.

Highlighting some KM strategies from the KMEF model, Mostofa (2024) added that organisational leadership, reward systems, teamwork, informal networks, and technologies are crucial to tacit knowledge sharing, motivating knowledge owners to share willingly. Other strategies derived from major KM strategies included Communities of Practice (CoPs), Tacit-Tacit Knowledge Exchange, Tacit-to-Explicit Management initiatives (TKMI), Cross-Collaboration, Internal Collaboration and mentoring.

The results discovered that the knowledge of KM strategies is essential; it was underdeveloped at the institution under review. The paper clearly illustrated that while robust KM is indispensable for effective commercialisation, its current implementation at the Polytechnic was fragmented and ad hoc. This deficiency resulted in missed opportunities to transform intellectual assets into marketable products. For example, A_2 alluded:

> *"We have been trying to partner with other companies. But so far, we have not sent prototypes to any company for further development and mass production.*"

Staff lacked awareness and training in KM principles, leading to misunderstandings and poor implementation. Most participants had little or no knowledge of KM; one participant, who came from a different KM culture (Japan), was informed. An anomaly and exception noted in the study was the exceptional KM proficiency displayed by a Japanese staff member. This suggested that exposure to different cultural norms and training standards could dramatically improve KM capabilities, highlighting an area where broader training interventions might be beneficial. There was confusion over definitions, such as mistaking KM for general data storage or for plagiarism prevention, indicating limited knowledge of KM. The

following extracts were some of the examples suggesting limited knowledge:

> InteL_11, "*Is the process of disseminating information within an organisation and even storing information*".

> InteL-3, *"The process of storage and publishing."*

> A_2, "*Assembly of knowledge through innovations by individuals*"

6.2 Fragmented implementation of knowledge management strategies

KM practices were inconsistently applied across the institution. This lack of a coherent strategy led to siloed efforts and duplicated work, thereby inhibiting the institution's overall capacity to capitalise on knowledge creation.

Exhibitions, workshops, trade fair attendance, and collaborations were cited as KM strategies currently in place at the Polytechnic under review.

> "*We attend trade fairs, shows, workshops, and other exhibitions*", noted InteL_1.

Some participants indicated that organising and attending research conferences were part of KM strategies that the institution was embarking on, for example, A_2, noted,

> "*We organise research conferences and workshops to share research work and share new ideas".*

Although staff participated in research conferences, exhibitions and trade fairs, these were not structured within a KM framework. There was no clear linkage between knowledge creation and its commercial exploitation, and KM strategies such as codification or personalisation were not used explicitly. While activities like exhibitions existed, they were not formalised or evaluated as part of a KM strategy. Participation in trade fairs and exhibitions was routine but not formally recognised as KM. There was no centralised system or formal strategies, such as codification or personalisation, in place. A low level of knowledge was attributed to the fact that KM in academic institutions, particularly in Zimbabwean polytechnics, was in its infancy. KM research in Zimbabwe was cited by Munyoro et al. (2022) as an area requiring greater attention from academics and practitioners.

6.3 Systemic gaps in infrastructure

There was a critical gap: the lack of a central repository or product warehouse, and products were not archived, tracked, or made accessible. Participants expressed that accessing past innovations was challenging, as InteL_9 noted,

> *"There is no single place where these products were systematically organised for easy access."*
> *"The institution does not have a central place or warehouse where these products are stored."*

> *"Each department keeps its products,"* concurred InteL_5.

This gap undermined the institution's ability to leverage existing knowledge. Products were often shelved post-exhibition, losing their value and commercial potential. For example,

> InteL_1 noted, *"Sometimes after exhibitions, the products are shelved and forgotten about, due to heavy workloads."*

Institutional policies were either under development or unknown, resulting in inconsistent practices. The absence of a product repository, structured policies, or operational KM frameworks led to the loss of institutional memory. InteL_12 remarked,

> "*Currently, we do not have clear structures in place in terms of product commercialisation.*"

highlighting the need for clearer guidelines and frameworks. Results indicated that institutional policies and structures existed in theory but were not widely known or applied. For example, A_1 noted,

> "*We do have policies in place, the Institution Intellectual Property Policy and the Research and Innovation Policy.*"

However, there were contrasting responses from administrators and lecturers pertaining to the existence of structures that promoted KM and commercialisation.

> "*There are no policies or structures"*, cited InteL_10,

Yet A_3 noted,

> "*There are structures in line with research, innovation and commercialisation, as well as policies, but they are not clearly defined*".

Although structured policies existed to support KM, many participants were unaware of them. This deviation indicated significant communication gaps and raised questions about how these policies were implemented or promoted within the institution.

6.4 Enablers of commercialisation

The findings of this study revealed that KM enablers of commercialisation included institutional support, intellectual property management, industry collaboration, funding mechanisms, and entrepreneurial culture. As highlighted by the 'Education 5.0' policy framework, Zimbabwean institutions must move beyond traditional pedagogy toward industrialisation and innovation (Makwerere & Zengeya, 2021). This necessitates a robust institutional ecosystem comprising Technology Transfer Offices (TTOs), intellectual property management, and structured industry collaborations. Without these 'scaffoldings,' local AI innovations remain trapped in the laboratory, failing to bridge the gap between academic output and commercialised national assets (Ssebuwufu et al., 2012). Results indicated institutional support and motivated employees as major

factors that facilitated the successful commercialisation of products at Mutare Polytechnic. This is in line with what Etzkowitz and Leydesdorff (2000) noted, namely that institutional support from polytechnic administrations is foundational to the successful commercialisation of knowledge products. This is also supported by Stankonsky and Baldanza's Knowledge Management Enabler Framework (KMEF), which emphasises creating an atmosphere that encourages readiness to share knowledge, enabling employees to share their tacit knowledge willingly.

Institutional support, motivated employees, the need for industry collaboration, the potential for intellectual property management, and exposure to research platforms were cited by participants as enablers of KM efforts at the reviewed institution. One participant remarked,

> *"We try by all means to motivate staff and students to create new knowledge,"* A_2.

Other participants acknowledged the institutional commitment towards knowledge creation and commercialisation,

> "*The institution in principle supports the drive to commercialisation*", noted InteL_11.

However, others expressed scepticism about their success, as noted by one,

> "*I don't think they are successful; if they were, we could be very far,"* InteL_7, indicating a perception of stagnation in commercialisation efforts.

However, results showed that these were being practised at a limited rate due to limited knowledge of the concept. The TVET institution provided opportunities such as research workshops, symposia, and international exposure. Participation in trade fairs and exhibitions was routine but not formally recognised as KM. However, financial limitations and unclear strategies undermined the effectiveness of this support. The administrators showed the initiative, but systemic backing remained limited.

6.5 Challenges/Barriers to the Commercialisation of Knowledge Products

Numerous challenges were identified: high production costs, market misalignment, lack of IP awareness or patenting strategy, limited partnerships with industry or tech transfer offices, unclear product pricing models, and minimal motivation due to limited incentives or project losses. There was a widespread sense of frustration and demotivation among staff that discouraged knowledge sharing.

> *"My product could be stolen if not protected because of a lack of awareness on KM, IP, and Policies",* remarked InteL-8.

A recurring theme was the critical role of organisational culture. These included limited

coordination of work, lack of effective communication,

> *"There are poor communication structures",* highlighted InteL_1.

Lack of interest and trust among staff and students, limited knowledge of patenting and intellectual property, high production costs, limited understanding of project/product documentation and financial constraints were also cited by participants.

> A_1 acknowledged, *"We try by all means to motivate staff and students to create new knowledge; however, the cake is small for everyone, you find that financial constraints usually limit all our endeavours in terms of product development"*

Also,

> Intel_4 noted *"There is a lack of financial resources, trending technologies and equipment."*

Participants felt that management, though they support knowledge creation and commercialisation in principle, felt the atmosphere was not very conducive, especially in terms of transparency of processes, for example,

> *"There is a lot of individualism and not practising sharing of information"*, remarked Intel_9.

Limited incentives were also cited as a challenge, affecting staff morale. This was mainly due to limited knowledge of the codification KM strategy, which allowed projects to start without proper documentation that stipulates all monetary requirements. For example,

> InteL_6 remarked, "*We sometimes start a project before studying the market, and later on, we realise we made a mistake".*
>
> "*We get demotivated even to work on projects because we normally have issues with payments"*, noted InteL_6.

Some of the challenges raised included heavy day-to-day business workloads and limited time to develop products for commercialisation, both of which discouraged the free flow of information and collaboration. For instance, InteL_7 mentioned

> *"We have limited time for continuous production of products that attract demand during trade fairs because of workloads in lecturing."*

InteL_2 had similar sentiments:

> *"Sometimes after exhibitions, the products are shelved and forgotten about, due to heavy workloads."*

These challenges inhibited commercialisation success. In contrast, environments that reward

knowledge sharing tend to foster innovation and better commercialisation outcomes.

The study recounted an instance where a registered company, intended to drive commercialisation, failed to sustain operations.

A_2:

> *The institution was far ahead in terms of commercialisation; we had a registered company, and we were competing with big organisations. However, during that time, the current commercialisation drive was not in place, so we faced many challenges and sometimes questioned whether we were staying within our mandate of training. Morale and the spirit to continue were dampened, and the company ceased operations. The current drive to industrialise and commercialise has energised us to continue, so we re-registered our company. However, the major challenge here could be that we are taxed before we are grown and established.*

This deviation underscored the complexity of translating theoretical KM frameworks into practical, long-term success, suggesting that ongoing adaptive strategies must support structural frameworks.

Effective commercialisation is contingent upon targeted training and a clear communication of existing policies. The study reinforces that enhancing staff's KM skills is a critical prerequisite for success.

Participants suggested concrete improvements, including forming patenting committees, developing clear KM policies, collaborating with IP bodies like ARIPO, and setting aside commercialisation budgets. These would support a robust, structured approach to KM. The following were recommendations suggested by participants:

InteL_1:

> *"The institution should establish a research and patenting committee and provide resources for research"*

InteL_3:

> "*There must be open participation in every way of projects, and a central place for all these products must be identified*"

InteL_5:

> "*The institution should be registered with organisations such as ARIPO*"

InteL_8:

> "*Budget should be set aside to implement those initiatives*"

A_1:

> "*Workshops must be conducted to educate members within the institution on patenting and covering knowledge gaps"*

A_3:

> *"The institution must create an environment in which information is disseminated to all members and is easy to find."*

emphasising the importance of accessibility and communication.

Participants felt that the institution should address certain issues, such as setting clear structures and budgets, and ensuring employee capacity in KM, IP, and product commercialisation.

7 Discussion of the Findings

The study studied knowledge management (KM) strategies for commercialisation at Mutare Polytechnic, framing the findings within the larger corpus of knowledge management (KM) practice in higher education and innovation systems. Staff familiarity with KM principles, fragmented application of KM practices and systemic silos in infrastructure became evident in the output. These results are consistent with the extant literature that outlines the limited maturity of KM in African institutions of higher education (Asiedu et al., 2022; Munyoro et al., 2022). Though KM is popular in a business sense, its deployment in polytechnics and TVET institutions remains unstandardised, resulting in lost opportunities to develop innovation and commercialisation. The lack of staff knowledge is consistent with research by Nawaz and Gomes (2020) and Nawe (2015), both of which found that KM knowledge is commonly limited in academic institutions. Participants' inability to articulate KM strategies illustrates the broader difficulty of integrating KM into pedagogical and institutional practice. This indicates that KM will be largely misinterpreted and ignored, thereby hindering commercialisation activities, without sensitisation and training. Knowledge is perceived in the literature (Khatun et al., 2021) because it is understood to be built upon itself. However, at Mutare Polytechnic, without systematic structures, KM is susceptible to duplicating work and the loss of institutional memory. Fragmented KM practices, such as reliance on exhibitions and trade fairs, were identified as insufficient for further commercialisation toward sustainability. This result aligns with Mazorodze and Mkhize (2024), who state that KM in higher education is rarely linked to a commercialisation pathway.

The lack of a unified repository or product warehouse at the Polytechnic further highlights systemic gaps, paralleling Lawrence and Santhose's (2023) observation that infrastructure and communication must play a key role in KM implementation. Without these codification and personalisation strategies, the outputs of knowledge are siloed and not scalable or market-ready. The study also highlighted commercialisation enablers, including institutional backing, IP protection, and industry partnerships. These are consistent with Etzkowitz and Leydesdorff (2000), who highlight the importance of institutional mechanisms and entrepreneurial culture in stimulating innovation. However, the few employees' understanding of

intellectual property rights suggests an important barrier (Asiedu et al., 2022). This void erodes the potential of polytechnics to safeguard and monetise their intellectual products; therefore, there is a dire need for clearly defined KM and IP policies. Theoretically, the findings suggest that the evidence can be interpreted through the Knowledge-Based View (Grant, 1996; Spender, 1996), which holds that knowledge is the most strategic asset for organisational competitiveness. Mutare Polytechnic's failure to systematically manage and utilise its knowledge wealth illustrates how knowledge-rich entities can become commercially inefficient without clear KM strategies. Both the Innovation Systems Theory (Lundvall, 1992; Nelson, 1993) and the Triple Helix Model (Etzkowitz & Leydesdorff, 2000) add value by situating the findings within a broader frame of reference, emphasising the role of institutional ecosystems and cross-sectoral collaborations. The weak industry linkages and fragmented policy frameworks that the Mutare Polytechnic case demonstrates are systemic challenges that restrict innovation across African polytechnics. To the extent that KM has been extensively studied in the corporate sphere, the role it plays in the more general context of polytechnics and TVET institutions has left a significant gap in the literature. If we attribute KM shortfalls directly to lost commercialisation opportunities, the study shows that polytechnics, provided they have strong KM strategies in place, can be catalysts for innovation and entrepreneurship. This places the Zimbabwean case within broader global discussions of knowledge economies, indicating that the challenges are not unique but also part of a broader challenge for knowledge creators to balance their knowledge investment with socio-economic welfare.

8 Conclusions

The study revealed a significant knowledge gap in KM that hampered product commercialisation. Limited understanding of KM strategies at the TVET institution had adversely affected the institution's capacity to realise its full potential in knowledge creation and the commercialisation of knowledge products. Most participants lacked awareness of KM strategies, highlighting the necessity for targeted training to enhance overall understanding.

The study showed that KM practices at the institution were scattered and lacked organisation, leading to inefficiencies. The current strategies were narrow in scope and did not fully understand the concept of KM, which otherwise could enhance commercialisation and competitive edge. The study emphasised the need to adopt KM strategies, such as codification and personalisation, as well as others based on the Socialisation, Externalisation, Combination, and Internalisation (SECI) model and the Knowledge Management Enabler Framework

(KMEF). Establishing a unified KM strategy is essential for improving the institution's capacity to foster knowledge creation.

The absence of clear structures, effectively communicated KM and IP policies, and a central repository for knowledge products seriously impaired the institution's capacity to track and leverage past innovations. These deficiencies underscored the necessity for improved organisational frameworks and communication channels.

Institutional support, intellectual property management, industry collaboration, funding mechanisms, entrepreneurial culture, and organisational culture served as key enablers. However, their impact was limited by a lack of knowledge in KM. Financial constraints also reduced the effectiveness of support mechanisms. As a result, the institution's potential for commercialisation was not fully realised due to underutilised enablers.

The study identified numerous challenges, including high production costs and low IP awareness. The institution lacked a reference centre to store and manage the generated knowledge for inference and ongoing improvement, nor a facility for commercial purposes. Information about knowledge produced over recent years was not easily accessible. These barriers, combined with a culture of limited trust and insufficient incentives, hindered successful commercialisation efforts.

The findings indicated that improving KM practices at the Polytechnic is essential for better commercialisation outcomes. Recommendations include establishing clearer KM policies, improving training programmes, and creating a centralised repository for knowledge products. The challenges revealed that the institution needs capacity building in the concept of KM, which positively influences commercialisation and competitive advantage. Addressing these areas can greatly enhance the institution's ability to innovate and commercialise.

9 Recommendations

Based on the findings and conclusions of the study, the following recommendations were suggested and aimed at improving practice, policy and decision-making regarding matters of knowledge management strategies for commercialisation at the TVET institution:

9.1 Knowledge deficit in KM

Capacity Building on KM Strategies: Organise targeted training programs for all staff to address the critical KM knowledge deficit. This should include workshops and seminars focused on understanding and applying KM strategies effectively.

9.2 Informal and unstructured KM practices

Establishment of KM Strategies: Form a dedicated team comprising librarians (who usually have better knowledge of KM, as alluded to in the study), decision-makers, and

the Innovation Division to develop and implement structured KM strategies. Emphasis should be placed on codification and personalisation methods, as well as on the SECI model and KMEF, to enhance coherence in KM practices.

9.3 Systemic gaps in infrastructure

Improved Organisational Structures: Develop clear KM and intellectual property (IP) policies and enhance communication channels to address existing infrastructure gaps. This includes establishing a centralised KM centre to capture and organise knowledge products effectively.

9.4 Enablers of commercialisation

Implementation of Enablers: Create a structured approach to implementing key commercialisation enablers, such as intellectual property management, industry collaboration, and funding mechanisms. Foster an entrepreneurial culture within the institution to fully leverage these enablers.

9.5 Challenges to commercialisation

Establishment of a Commercial Shop: Set up a commercial shop in collaboration with the Business Development Unit to facilitate the sale of knowledge products. This addresses the barrier posed by high production costs and enhances access to the generated knowledge.

9.6 Areas for further research

This study assessed KM strategies for commercialisation at Mutare Polytechnic, but limited its scope to a single polytechnic due to time and financial constraints. Further research can thus be conducted and expanded to include other institutions of higher learning, enabling them to realise the benefits of KM and commercialisation. Also, the study's findings revealed limited knowledge of KM strategies that directly influence commercialisation, as well as several challenges. These can be other interesting areas for further academic research. Interested researchers may examine the impact of knowledge and training on KM strategies in relation to commercialisation and competitive advantage.

10 Implications of the Study

This study holds both local and global significance. It recommends that Mutare Polytechnic adopt clear KM and IP policies, establish centralised repositories, and train staff in KM practices. More broadly, it demonstrates how polytechnics and TVET institutions can foster innovation and entrepreneurship through systematic knowledge management. By placing the Zimbabwean case within broader theoretical debates, the study illustrates that KM strategies are crucial for transforming intellectual outputs into socio-economic value. For librarians, educators, and policymakers, the findings underline the importance of integrating KM frameworks into institutional practices to enhance scholarly communication and development.

Data availability

The data supporting the results are available from the authors upon request. The dataset consists of audio interviews stored on hard drives.

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Conflict of interest

The authors report no competing interests.

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