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# Mapping TPACK Components in Implementing Edupreneur-Profiled Curriculum at Teacher Training and Education Institutions in Aceh

**Lailatussaadah[1]*, Salma Hayati[1], Asyraf Isyraqi Bin Jamil[2], Fakhrul Adabi Bin Abdul Kadir[2]**
[1]Faculty of Education and Teacher Training, Universitas Islam Negeri Ar-Raniry Banda Aceh, Indonesia
[2]Academy of Islamic Studies, University of Malaya, Malaysia

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***Correspondence Address:**
lailatussaadah@ar-raniry.ac.id

**Abstract:** This research aims to explore the mapping of Technological Pedagogical Content Knowledge (TPACK) components of instructors in implementing the Edupreneur-profiled curriculum in Islamic Higher Education Institutions (PTKI) in Aceh. The researchers employed interview methods, observations, and document reviews involving three heads of study programs and six instructors from three PTKIs (Islamic Higher Education Institutions) in Aceh, namely UIN Ar-Raniry, IAIN Lhokseumawe, and STAIN Teungku Dirundang Meulaboh. The data analysis was conducted interactively. Instructors teaching Edupreneurship-profiled courses have successfully integrated Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TCK), and Technological Content Knowledge (TPK) as components of TPACK in their teaching practices. This research contributes to mapping these components, thereby aiding instructors in effectively implementing the entrepreneurship-profiled curriculum. In conclusion, this research provides valuable insights into the effectiveness of Open Educational Resources (OER) on creative thinking within the context of science subjects, filling a notable gap in the existing literature and offering a foundation for further exploration in educational practices.

## INTRODUCTION

As a pivotal academic subject, entrepreneurship has garnered significant attention within higher education institutions. The focus on entrepreneurship aims to produce graduates who are better prepared to become job creators (Azwar, 2019). Moreover, this approach is anticipated to offer solutions to the escalating issue of unemployment in Indonesia (Marwanti et al., 2012; Sinaulan, 2019; Wijayanto & Ode, 2019). Nonetheless, research also highlights a disconcerting observation: the higher the level of education an individual attains, the lower their level of independence and entrepreneurial spirit (Ariska & Sahid, 2022; Siswoyo, 2009). Furthermore, the achievements of higher education are not entirely aligned with industry expectations (Wiratno, 2012).

Implementing entrepreneurship education in higher education institutions faces substantial challenges, notably regarding financial constraints and human resources (Adnan et al., 2020). Previous studies have demonstrated that incorporating entrepreneurship education at the tertiary level and cultivating a positive environment within the

educational system can yield positive impacts, particularly in fostering an entrepreneurial culture and spirit (Bazan et al., 2020; Ciputra, 2007; Lailatussaadah et al., 2020; Sentoso, 2012; Subandi, 2015; Zubaedi, 2015).

To achieve these goals, the presence of faculty possessing Technological Pedagogical Content Knowledge (TPACK) is paramount. TPACK is a learning model derived from Pedagogical Content Knowledge (PCK), initially formulated by Shulman. TPACK integrates knowledge from four primary components: pedagogical expertise, subject matter, student characteristics, and the contextual environment (Malik et al., 2019). This model introduces a technological dimension integrated with PCK, forming a framework synthesizing content, pedagogy, and technology knowledge.

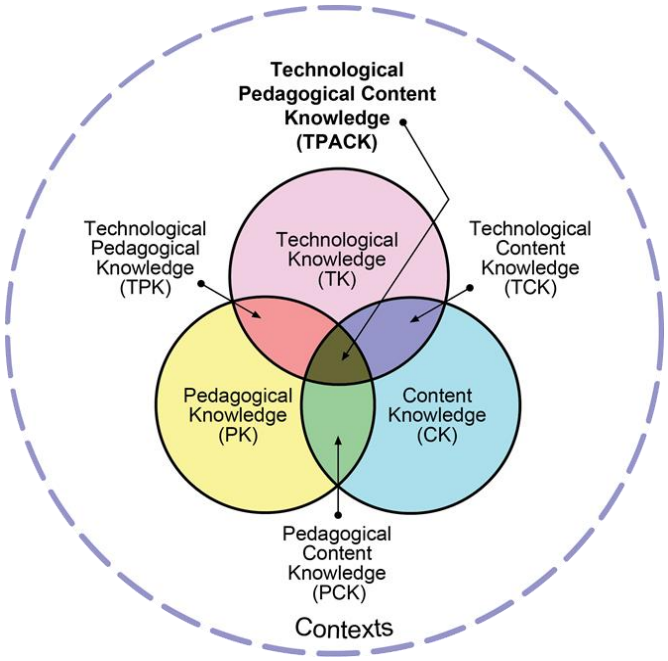


**Figure 1.** TPACK Framework Illustration (Koehler et al., 2013); Depicting the Interplay of Technological Knowledge, Content, and Pedagogical Approaches.

In the context of entrepreneurship-focused coursework, the role of TPACK-equipped educators becomes pivotal in facilitating comprehensive knowledge absorption among students. Prior research has revealed that TPACK significantly influences the development of instructional materials (Sholihah et al., 2016). Other findings indicate a positive correlation between the instructional strategies of educators and their TPACK in preservice teaching (Baran et al., 2019). Additional studies have underscored the positive impact of TPACK development, employing mobile devices for tailored student learning needs (Hossain et al., 2019).

While these studies contribute valuably, an in-depth investigation into the mapping of faculty TPACK within the context of Edupreneurial profile curricula, particularly within Islamic higher education institutions, remains absent. This study seeks to delve deeper into the effective TPACK formulation for implementing Edupreneurial profile curricula in state Islamic higher education institutions in the Aceh region. Empirical data from state Islamic higher education institutions in Aceh reveals the presence of entrepreneurship and Edupreneurial courses aimed at enabling students to master the procedure of identifying diverse entrepreneurial endeavors grounded in

innovation and self-reliance, guided by Islamic values and principles, as well as local, national, and global perspectives.

Based on theoretical insights and empirical findings, this study endeavors to formulate an effective faculty TPACK model for executing Edupreneurial profile curricula in educational institutions and educational personnel and state Islamic higher education institutions Aceh.

## METHOD

This study employs a qualitative descriptive approach to comprehensively investigate information regarding the research subjects, namely instructors who teach courses with an Edupreneurial profile (Creswell, 2009). The research is conducted across three institutions in Aceh. The research subjects are purposively selected, involving 15 instructors who teach Edupreneurial-profiled curriculum within educational institutions, educational staff, and state Islamic universities.

The collected data is analyzed using a qualitative analysis approach. This approach adopts the theory proposed by (Miles et al., 2014) and encompasses a series of stages, including data collection, reduction, presentation, and conclusion. Firstly, data collection is conducted through interviews, observations, and documentation aligned with the research problem's focus. The data collected during this phase is the initial step in the qualitative analysis process.

Secondly, the data reduction phase involves sorting, grouping, and categorizing relevant data while eliminating irrelevant data. This step aims to organize the data to align with the research's focal points. Thirdly, the reduced data is coherently presented according to the research's focus. This presentation entails structuring data in a more organized and clearer format to ensure the information is well understood. Lastly, the conclusion-drawing stage aims to extract meaning from the obtained data and elucidate the findings that arise from the data. The ultimate objective of this stage is to formulate accurate and pertinent conclusions aligned with the research's goals.

Hence, this qualitative analysis approach is utilized to comprehend the TPACK mapping of the instructors in implementing an Edupreneurial-profiled curriculum within educational institutions, educational staff, and state Islamic universities in Aceh.

## RESULT AND DISCUSSION

Each program of study at the three research locations offers several courses with an Edupreneurship focus. The programs appoint instructors who possess the requisite expertise for these Edupreneurship-focused courses. This aligns with the requirements for achieving Learning Outcomes (LO), wherein these instructors must be able to design engaging, creative, innovative, technologically advanced, productive, and enjoyable course materials (Hayati, 2017; Hayati & Lailatussaadah, 2013).

The curriculum development process involves mapping out TPACK (Technological Pedagogical and Content Knowledge). In this process, we identify knowledge and competencies within Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), and Technological Content Knowledge (TCK). These components are integrated to form Technological Pedagogical and Content Knowledge (TPACK).

### Technological Knowledge (TK)

Technology Knowledge refers to knowledge about various technologies, including software and hardware. The analysis results found that course instructors with an Edupreneurship profile possess technology knowledge characterized by using and utilizing

technology in teaching. In implementing their teaching, instructors with an Edupreneurial profile respond to the media used in course delivery.

**Table 1.** Excerpts from Interviews.

| No | Statement | Sources |
|---|---|---|
| 1. | I use PPT, Video, Canva, YouTube, Microsoft Office, and easily accessible email for students. | Lecturer 1,2,3 |
| 2. | I use online libraries like iPusnas, PPT, GCR, YouTube because they are not complicated to access and provide many references. | Lecturer 3,4,6 |
| 3. | I use PPT, Academia Edu, Vidgram, Video Conference, e-learning, YouTube, Canvas because once opened, they provide many other references. | Lecturer 1-6 |

The In this context, the technology used is as shown in Figure 2. Based on Figure 2, it can be seen that instructors of courses with an Edupreneurial profile use various technologies in their teaching. The research findings indicate that instructors use email, WhatsApp, Google Classroom, Canvas, Microsoft Office, simple and interactive PPTs, video, Vidgram, video conferencing, e-learning, YouTube, iPusnas, academia edu, and Canva. Technology is crucial in higher education learning (Ahmad et al., 2020; Fernández-Batanero et al., 2022; Indrajit, 2011; Trevisan et al., 2023).


**Figure 2.** Use of Technology in Edupreneur-Profiled Courses.

## Content Knowledge (CK)

Content knowledge is related to the subject matter taught. The content knowledge (CK) analysis of instructors in Edupreneur-profiled courses reveals that instructors possess expertise and knowledge related to the subjects they teach. This is based on interview data that indicate instructors teaching Edupreneur-profiled courses have educational qualifications that align with their teaching field. For example, courses like "Project Management and Marketing," "Event Management," and "Entrepreneurship" are taught by instructors with Master's degrees in Management. Additionally, these instructors often have experience in specific business ventures. In general, instructors in Edupreneurship-based courses provide similar responses.

**Table 2.** Excerpts from Interviews.

| No | Statement | Source |
|---|---|---|
| 1. | I develop teaching materials, starting with creating content on entrepreneurship in general. Then, I proceed with facts about the importance of entrepreneurship. Conceptually, I also teach students to classify or categorize forms of businesses that can be considered entrepreneurial. Besides, I ask students to follow the steps to become entrepreneurs capable of solving current national issues. Finally, I ask students to assess themselves and build strategies to become entrepreneurs who can thrive and develop themselves and their businesses. I source my teaching materials from e-journals, books, and YouTube because this course involves practical aspects often found on YouTube. Sometimes, it comes from personal experience or insights from friends who own businesses. | Lecturer 1 |

In packaging teaching materials, instructors in Edupreneur-profiled courses develop their materials according to the characteristics of the course. Teaching materials for these courses encompass various components, including factual, conceptual, principle-based, procedural, and metacognitive elements, reflecting the breadth, depth, and contextual nature of material development (Tomlinson, 2013). The research findings are represented in Figure 3.


**Figure 3.** Development of Teaching Materials in Edupreneur-Profiled Courses.

Figure 3 provides an overview of the development of teaching materials in Edupreneur-profiled courses. In developing teaching materials, instructors in these courses use references from various non-digital and digital sources. Non-digital sources include books, modules/teaching materials, and input from entrepreneurship experts/business owners. Digital sources include e-modules, e-journals, YouTube tutorials, and e-learning platforms. E-learning is believed to support learning (Sherrin, 2020; Syahputra & Saragih, 2021). The references used in material development can be seen visually in Figure 4.

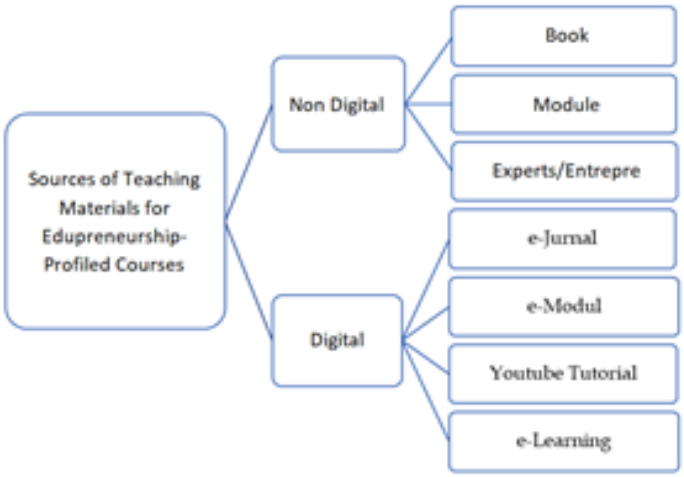


**Figure 4.** Sources for Developing Teaching Materials in Edupreneur-Profiled Courses.

## Pedagogical Knowledge (PK)

Pedagogical knowledge refers to knowledge related to the general teaching and learning processes, including assessment, student engagement, and classroom management (Abdullah et al., 2023). Research results related to the pedagogical knowledge (PK) of instructors in Edupreneur-profiled courses indicate that these instructors possess pedagogical knowledge, allowing them to conduct their courses effectively. This is evident in the documentation of semester course planning and open-ended questionnaire data.

**Table 3.** Excerpts from Interviews.

| No | Statement | Sources |
|---|---|---|
| 1. | I design semester course planning and develop it every semester because there are always new material developments based on the latest sources, using appropriate methods because this course involves a lot of practical aspects. | Lecturer 1-6 |
| 2. | I develop semester course planning, teaching materials, and learning media based on students' needs. Because the needs vary yearly. | Lecturer 1-6 |
| 3. | I create semester course planning according to the LO and program profile, but I develop course learning outcomes based on the current material developments | Lecturer 1-4 |
| 4. | I design plans, appropriate teaching materials, user-friendly teaching media, and create authentic assessments to evaluate comprehensively. | Lecturer 2-6 |

Pedagogically, instructors conduct their courses by adhering to the program's curriculum and designing a course plan, including preparing semester course planning, course activities, teaching materials, preparing media for the teaching process, and planning course assessments. Analysis of instructors' semester course planning reveals that well-designed semester course planning includes clear and practical components, such as identity, Learning Outcomes, course learning outcomes, course descriptions, learning activity matrices, references, assignments (structured and independent assignments), and assessments. Course planning is essential as a framework and reference for instructors and students conducting the course (Nasution, 2017; Suryadi & Mushlih, 2019). Visually, the course planning for Edupreneur-profiled courses by instructors is depicted in Figure 5.

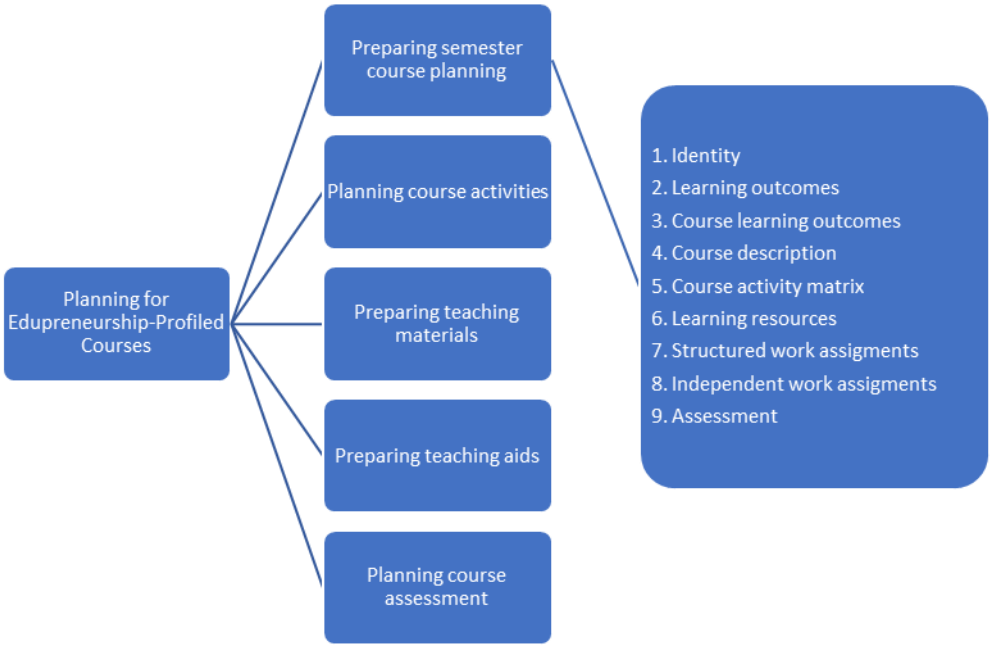


**Figure 5.** Edupreneur-Profiled Course Planning by Instructors.

During the course implementation stage, based on documentation and questionnaire data, it is evident that instructors of Edupreneur-profiled courses employ various methods, techniques, and media in their teaching. The research findings indicate several methods instructors use: demonstration, simulation, practical techniques, workshops, assignments, field trips, discussions, and question-and-answer sessions. Here are forms of activities conducted based on these teaching methods:

1. The demonstration method includes creating media, marketing, service models, and product demonstrations during market day activities.
2. The simulation method includes simulating media usage at bazaars, simulating products through videos, simulating the marketing process through role-playing as sellers, buyers, and evaluators, as well as using applications like Paypazz/PhET simulation.
3. The practical technique involves practical exercises in creating media, producing and marketing products, modeling services, educational project practices, event modeling in student conferences, cultural events, and bazaars, and creating products using recycled materials.
4. Workshops guide media creation and entrepreneurship skills workshops, such as handicraft making.
5. Assignments include individual and group tasks for creating media, generating ideas and turning them into products, creating service model instruments, public relations activities, educational projects, event creation tasks, assignments to produce and market hand sanitizers and masks, creating media tasks using applications like Macromedia SX4, and tasks to create sellable products.
6. Field trips involve visiting various business establishments.
7. Discussions occur during the teaching process, both during content delivery and after skill-based learning activities.
8. Question-and-answer sessions are conducted during teaching, content delivery, and skill-based learning activities.


**Figure 6.** Edupreneur-Profiled Course Activities.

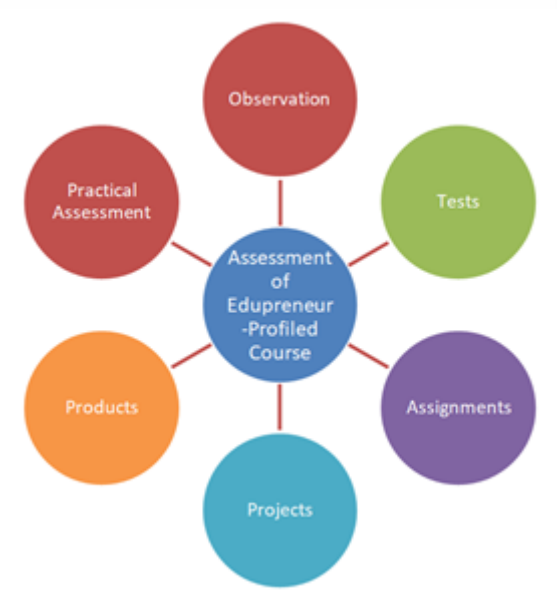


**Figure 7.** Edupreneur-Profiled Course Assessment Activities.

The methods employed by instructors in Edupreneur-profiled courses indicate that the courses are conducted actively, with students playing a central role. These methods emphasize practical experience. Pittaway & Thorpe (2012) and Pittaway & Cope (2007) emphasize that entrepreneurship education should be action-oriented to provide learners with experiential learning. Even Gibb (1965) suggests it should be done through a prediction approach (effectual reasoning). Other studies have found that entrepreneurship teaching methods include simulation, video and film, case studies, workshops, project-based methods, group

discussions, and team-based learning (Michaelsen et al., 2008).

In the evaluation stage, based on the data obtained, instructors of Edupreneur-profiled courses plan assessments to measure students' attitudes, knowledge, and skills. Instructors use various assessment techniques in conducting assessments, including observation, oral and written tests, assignments, projects, products, and practical assessments. Assessments are predominantly used to measure students' cognitive competencies in the Edupreneurship course they are teaching. However, authentic assessment is essential to measure cognitive, affective, and psychomotor domains (Imaduddin & Zuhaida, 2019; Sakti, 2022). Visually, the assessment activities for Edupreneur-profiled courses are depicted in Figure 7.

**Pedagogical Content Knowledge (PCK)**

Pedagogical Content Knowledge (PCK) refers to knowledge that integrates the delivery teaching model, combining subject matter and pedagogy. The PCK competence of educators specializing in Edupreneur-profiled courses can be observed in research data, where instructors integrate two components, namely pedagogy and subject matter in their teaching.

**Table 4.** Excerpts from Interviews.

| No | Statement | Source |
|---|---|---|
| 1. | I design course materials in various forms, including information technology, books, various online learning resources, and scientific activities such as market research, exploring market trends, presenting data for analysis, and applying a scientific approach to determine the depth of the subject matter. | Lecturer 2 |

Course materials for Edupreneur-profiled courses, which have been extensively and deeply developed through modules, textbooks, or other means, are taught in specific ways, using methods, models, techniques, and so on, by pre-established plans. Materials in appropriate formats and tools can serve as scaffolding and reflective organization of the relationship between pedagogy and subject matter (Hauerwas et al., 2023; Nilsson & Karlsson, 2019).

Course materials include books, modules/teaching materials, and experts/entrepreneurs. They are delivered to students through prior planning, followed by the implementation of the teaching plan. Visually, the implementation of PCK by instructors of Edupreneur-profiled courses can be seen in Figure 8 below.

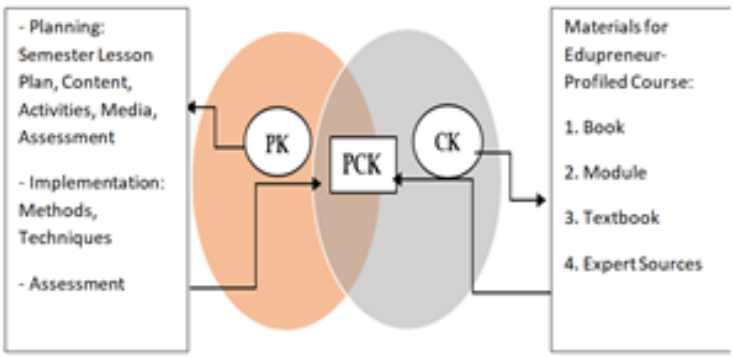


**Figure 8.** Implementation of Pedagogical Content Knowledge for Edupreneur-Profiled Courses.

**Technological Content Knowledge (TCK)**

Technological Content Knowledge, which encompasses how technology can be used to represent course content and transform how learners interact with concepts, is evident in the knowledge of instructors teaching Edupreneur-profiled courses, as revealed through research data.

**Table 5.** Excerpts from Interviews.

| No | Statement | Source |
|---|---|---|
| 1. | At present, we are certainly required to use technology in various aspects, especially in teaching. All activities were conducted online, especially during the COVID-19 pandemic, which required technology. So, automatically, we had to learn to use technology in all teaching and learning activities. | Lecturer 1 |

As found by (Tseng et al., 2022), the technological knowledge of instructors can influence students' mastery of the subject matter. Similar findings were mentioned by (Martha et al., 2018). Instructors deliver or transfer materials, including factual, conceptual, moral, procedural, and metacognitive knowledge, by utilizing technology in preparing and implementing the content. Comprehensive coverage of the material in such teaching can be easily achieved by mastering technology (Vukić et al., 2020).

Learning materials are packaged through e-modules, e-journals, YouTube tutorials, PowerPoint presentations (both simple and interactive), as well as e-learning. In this context, students interact with technology instructors to facilitate knowledge acquisition. Visually, the implementation of TCK by instructors of Edupreneur-profiled courses can be seen in Figure 9 below.

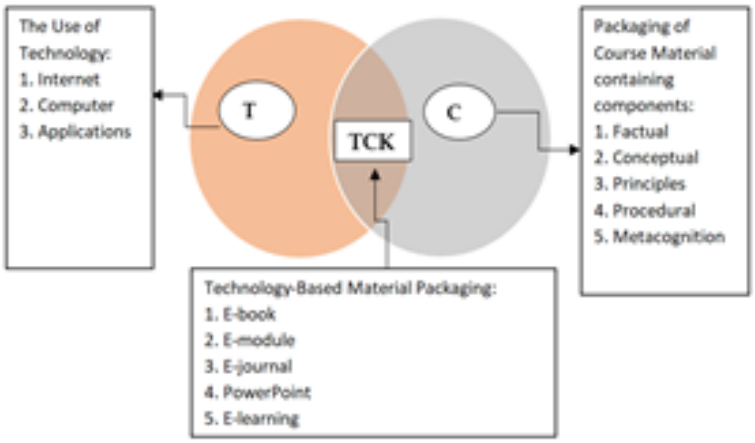


**Figure 9.** Implementation of Technological Content Knowledge for Edupreneur-Profiled Courses.

**Technological Pedagogical Knowledge (TPK)**

Technological Pedagogical Knowledge (TPK) refers to knowledge related to how technology can be used in teaching and learning. Understanding the teaching and learning process can change when specific technologies are used in particular ways. Excerpts from interviews with instructors regarding their knowledge of technology usage in teaching are presented in Table 6.

**Table 6.** Excerpts from Interviews.

| No | Statement | Source |
|---|---|---|
| 1. | I use various methods and digital media in teaching. | Lecturer 4 |

The TPK of instructors teaching Edupreneur-profiled courses can be discerned from the course implementation process. Instructors plan and conduct their courses using technology. The current advancement in technology necessitates instructors to be capable of integrating technology into their teaching (Graeske & Sjöberg, 2021; Hijriyah et al., 2022; Mahyiddin & Amin, 2022). (Shinas et al., 2013) stated that technology influences teaching and learning. Visually, the implementation of TPK by instructors of Edupreneur-profiled courses can be seen in Figure 10.

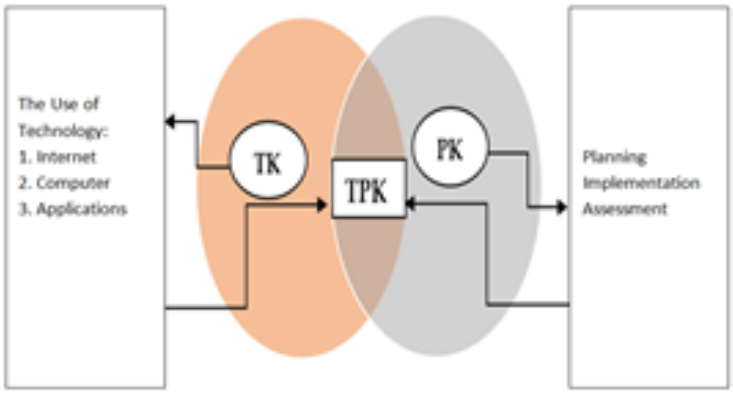


**Figure 10.** Implementation of Technological Pedagogical Knowledge for Edupreneur-Profiled Courses.

The exploration and delineation of Technological Pedagogical Content Knowledge (TPACK) components in executing courses oriented towards Edupreneurship encompass a comprehensive framework. This framework encompasses the nuanced integration of Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TCK), and Technological Content Knowledge (TPK).

Within the domain of Edupreneurship-profiled courses, instructors' Pedagogical Content Knowledge unfolds across various stages, commencing with meticulous planning, execution, and assessment. It extends to creating educational materials manifested in modules, textbooks, and references from expert sources. The intricate interplay of these facets contributes to a holistic approach to pedagogical content expertise.

Simultaneously, the enactment of Technological Pedagogical Knowledge by instructors involved in Edupreneurship-profiled courses is characterized by the adept utilization of technology-based resources. This includes packaging educational content into formats such as e-books, e-modules, and e-journals, as well as creating simple and interactive PowerPoint presentations and e-learning materials. This multifaceted technology integration enhances the instructional strategies employed within the Edupreneurship context.

Moreover, the Technological Content Knowledge dimension involves strategically orchestrating technology-enhanced learning experiences, encompassing the proficient utilization of the internet, computers, and various applications. The planning, executing, and assessing of these technology-infused learning initiatives contribute to a comprehensive understanding of the intersection between technology and

content knowledge within the Edupreneurial educational landscape.

In the context of entrepreneurship-focused coursework, the role of TPACK-equipped educators becomes pivotal in facilitating comprehensive knowledge absorption among students. Prior research has revealed that TPACK significantly influences the development of instructional materials (Sholihah et al., 2016). Other findings indicate a positive correlation between the instructional strategies of educators and their TPACK in preservice teaching (Baran et al., 2019). Additional studies have underscored the positive impact of TPACK development, employing mobile devices for tailored student learning needs (Hossain et al., 2019).

While extensive in mapping instructors' Technological Pedagogical Content Knowledge within Entrepreneurship-profiled courses, it is imperative to note that this research does not yet provide a formulated framework for such knowledge in the context of entrepreneurship courses. The absence of a dedicated Technological Pedagogical Content Knowledge framework for entrepreneurship courses highlights an avenue for future research and development. Such a framework could serve as a guiding paradigm for the effective implementation of entrepreneurship courses, ultimately benefiting students as active participants in the educational process.

## CONCLUSION

Mapping the Technological Pedagogical Content Knowledge components in the Implementation of Edupreneurship-Profiled Courses includes Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TCK), and Technological Content Knowledge (TPK). The Pedagogical Content Knowledge of instructors teaching Edupreneurship-profiled courses begins with planning, implementation, and assessment, as well as the development of materials in the form of modules, textbooks, and expert sources. Technological Pedagogical Knowledge, performed by instructors of Edupreneurship-profiled courses, involves packaging technology-based materials such as e-books, e-modules, e-journals, simple and interactive PowerPoint presentations, and e-learning. Meanwhile, the Technological Content Knowledge includes planning, implementing, and assessing technology-enhanced learning, utilizing the internet, computers, and applications. This research is limited to mapping instructors' Technological Pedagogical Content Knowledge in the context of Edupreneurship-profiled courses, and a Technological Pedagogical Content Knowledge framework for entrepreneurship courses has not been formulated yet. Such a framework could serve as a guideline for the effective implementation of entrepreneurship courses, benefiting students as subjects in the course.

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