A Conceptual Framework for Curriculum Design Based on the 'Pregnant Curriculum' Metaphor

Hadzley Abu Bakar[1*], Mohd Basri Ali[1], Nur Ana Rosli[1], Shaiful Anwar Ismail[1], Siti Rahmah Shamsuri[1], Umi Hayati Ahmad[1], Safarudin Gazali Herawan[2]

[1]Fakulti Teknologi dan Kejuruteraan Industri dan Pembuatan, Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia, [2]Industrial Engineering Department, Faculty of Engineering, Bina Nusantara University, Jakarta, Indonesia
[*]Corresponding Author Email: hadzley@utem.edu.my

Abstract
The post-pandemic transformation of higher education has accelerated the shift toward skill-based, outcome-oriented, and human-centred curricula. In Malaysia, universities and Technical and Vocational Education and Training (TVET) institutions face growing pressure to produce graduates with critical thinking, adaptability, and resilience in line with the Malaysia Education Development Plan 2025–2030. Yet, gaps persist between policy and practice. This study introduces the "Pregnant Curriculum" metaphor, which frames curriculum design as a developmental process moving through conception, growth, and delivery. Grounded in Outcome-Based Education (OBE), Constructive Alignment, Backward Design, and Curriculum Metaphor Theory, the model integrates cognitive and affective learning dimensions to promote holistic graduate development. Using a Design-Based Research (DBR) approach, 33 Malaysian curriculum practitioners from Universiti Teknikal Malaysia Melaka (UTeM) evaluated the metaphor through a professional development workshop. Over 80% demonstrated moderate to high understanding, confirming its clarity and relevance. Findings show the metaphor strengthens conceptual alignment and reflective engagement but requires contextual scaffolding for broader application. The study concludes that metaphorical framing enhances curriculum ownership and bridges the policy–practice divide, supporting Malaysia's goal of sustainable, human-centred education under SDG 4 (Quality Education).
Keywords: Curriculum Design, Curriculum Metaphor, Graduate Attributes

Introduction
        The design of higher education curricula has transformed significantly, especially after the pandemic. Emphasis has shifted toward skill-based, competency-driven, student-centred, and future-oriented approaches to prepare graduates for complex and evolving work

environments. The move to Outcome-Based Education (OBE), combined with global trends in digitalisation, TVET, and AI, has pushed Malaysian universities to align curricula with national education transformation goals. Holistic models now integrate attitudes and lifelong learning skills for ethical and adaptable graduates (Foong, 2024; Sim & Muhamad, 2024).

The Malaysia Education Development Plan 2025–2030 highlights balanced graduates with critical thinking, leadership, skills and entrepreneurial competencies. TVET institutions, especially universities, play a vital role in producing work-ready graduates. Yet, many educators struggle to translate policy into impactful curriculum design, particularly in work-based learning (WBL). Despite continuous efforts, a gap remains between intended outcomes and actual graduate readiness, reflected in declining enrolment in critical programmes like engineering and technology. Misalignments between curricula and industry expectations continue to weaken the program's ability to produce students who are work-ready upon graduation, prompting revisions toward more relevant and human-centred structures (Ridzuan & Abd Rahman, 2023; Ismail et. al, 2024; Ngubane et. al, 2025).

Previous studies on OBE and backward design highlight structured outcome alignment, but metaphor-based frameworks remain underexplored in Malaysian higher education. Metaphors translate complex ideas into understandable concepts, yet few studies evaluate metaphor-based curriculum models aligned with programme outcomes, which challenge the student to solve the problem especially in vocational and technology contexts where skills and attitudes are critical (Mitchell et. al, 2019; Baş & Sarpkaya 2020).

This study is motivated by the challenge of aligning higher education curricula with changing industry and social needs. Although Outcome-Based Education and skill-focused reforms are widely promoted, many educators still struggle to apply them effectively. To address this, the study integrates four frameworks: Outcome-Based Education, Constructive Alignment, Backward Design, and Curriculum Metaphor Theory. It highlights the affective domain, including emotions, ethics, and identity, as essential for balanced graduates. The paper introduces the Pregnant Curriculum Metaphor, which views curriculum planning as a purposeful process of growth and care from conception to delivery. Using a design-based research approach with 33 Malaysian educators, the study evaluates the metaphor's clarity, relevance, and usefulness in connecting cognitive and emotional understanding for sustainable curriculum reform aligned with SDG 4.

Methodology

This study used a Design-Based Research (DBR) methodology, which is well suited for improving educational interventions through iterative cycles of analysis, design, development, and implementation. The approach aligns with the study's two main aims which to conceptualise and validate a curriculum design model based on the Pregnant Curriculum metaphor, and to evaluate its relevance and perceived applicability among curriculum designers and practitioners.
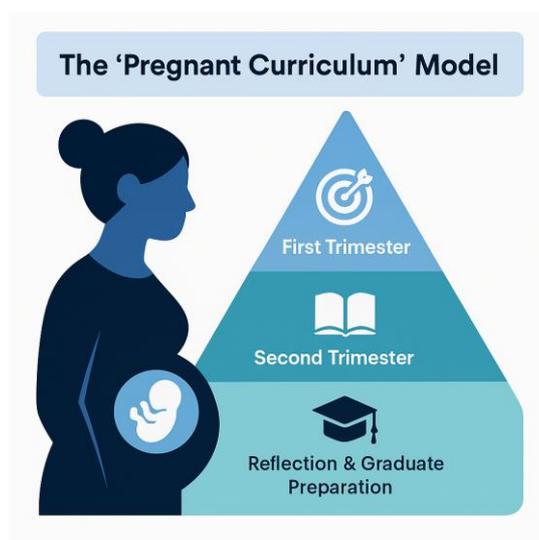
Fig. 1 The Pregnant Curriculum Model

Phase 1: Professional Development Workshop
A specialised workshop was conducted for curriculum developers in the TVET sector, involving 33 academics from Universiti Teknikal Malaysia Melaka (UTeM). Participants were selected for their active involvement in curriculum development, academic leadership, and educational innovation. The workshop introduced curriculum approaches aligned with TVET principles, shared delivery and reflective strategies, and engaged participants in collective reflection on the Pregnant Curriculum model. The model was presented for the first time through a visual infographic that linked stages of pregnancy to phases of curriculum planning, with "birth" representing programme outcomes. Discussions related each stage to elements such as Programme Educational Objectives, Learning Outcomes, curriculum mapping, and graduate attributes. The metaphor also highlighted emotional investment, social responsibility, and readiness, reflecting the experiences of expectant parents and framing curriculum design as a more human-centred and socially grounded process.

Phase 2: Data Collection
Participants completed a Google Forms survey with two sections. The first used Likert-scale items to assess clarity, usefulness for curriculum design, relevance to institutional practice, and applicability to work-based learning. The second included open-ended questions to capture reflections on emotional and pedagogical impact, suggestions for improvement, and challenges in applying the framework.

Data were analysed in two stages. Quantitative data were summarised using descriptive statistics to gauge clarity and overall reception, while qualitative responses were thematically coded. Three key themes emerged involving curriculum ownership through metaphor, a scaffolded mindset for programme design, and the integration of affective domains in curriculum planning.

Table 1
Survey and Data Analysis Framework

| Phase	Component	Focus	Output
Survey – Part A (Quantitative)	Likert-scale items	- Clarity of the metaphor - Usefulness for curriculum design - Relevance to institutional practices - Applicability to work-based learning	Percentage agreement on clarity, usefulness, relevance, and applicability
Survey – Part B (Qualitative)	Open-ended items	- Reflections on emotional and - Suggestions for improvement or local - Perceived challenges in applying the	Rich, contextual insights for interpretation
Phase 3: Data Analysis	Quantitative	Descriptive statistics (percentage	Overall reception and clarity levels
	Qualitative	Thematic coding (Braun & Clarke, 2006)	Themes: 1. Curriculum ownership through metaphor 2. Scaffolded mindset for programme design 3. Integration of affective domains in planning
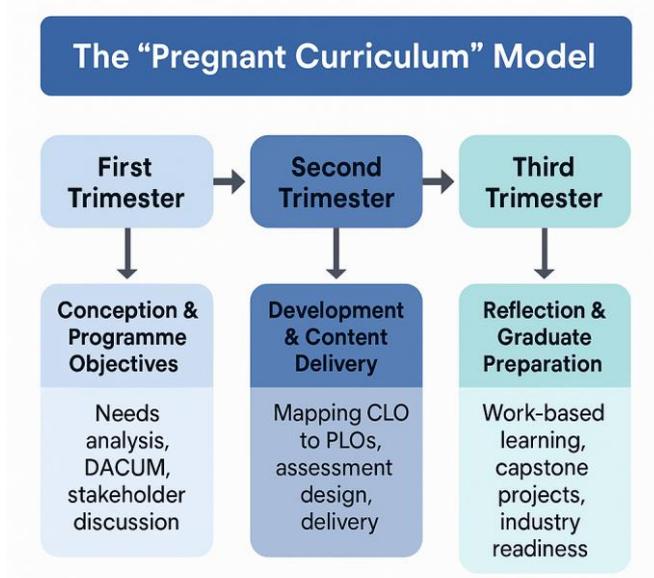
Fig. 2 *The Pregnant Curriculum Model, A metaphor-based framework linking curriculum design to human developmental stages. The model visualises key curriculum phases: (1) Conception (vision and outcomes), (2) Nurturing (curriculum delivery and support), and (3)*

Delivery (graduate transition and impact), highlighting the emotional, intellectual, and ethical dimensions of academic planning.

Results and Discussion

Figure 3 presents the average scores from 33 workshop participants, showing strong acceptance of the "pregnant mother" metaphor. High ratings for clarity and relevance indicate that metaphorical framing enhances accessibility and reflection among curriculum practitioners. A survey of 33 respondents measured understanding, acceptance, and perceived relevance of the metaphor for curriculum progression and outcomes. Findings show that metaphorical framing shapes interpretation of curriculum design while highlighting areas needing clearer explanation.

In the presented graphs, a score of 5 indicates "strongly agree," while a score of 1 indicates "strongly disagree. Most participants demonstrated strong comprehension with 57.6% rated level 4 and 24.2% rated level 5, while only 6.1% rated level 1. This suggests the metaphor effectively conveyed gradual development and nurturing, though a few respondents showed limited understanding and reflecting how cultural and experiential backgrounds influence metaphor interpretation. Educators should therefore complement metaphors with explicit explanations and contextualisation (Baş & Sarpkaya 2020).

Figure 4 assessed participants' ability to apply the metaphor to curriculum design. While responses clustered toward higher ratings, variation was greater than in Figure 3. Overall, 81.8% showed moderate to high understanding, confirming the metaphor's strength in communicating progressive and holistic development. Representing growth from conception (planning) to delivery (graduation), the metaphor aligns with holistic education theories and supports engagement and comprehension in curriculum innovation (Chavez, et. al 2023; Lynch & Fisher-Ari, 2017).
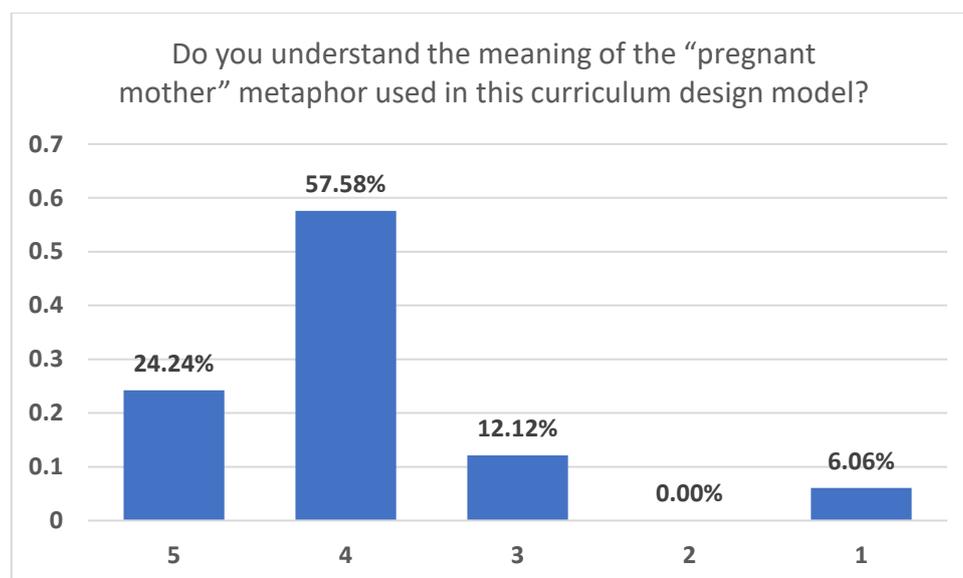

Fig 3 : Interpretation of the 'Pregnant Mother' Metaphor Among Survey Participants

Do you understand the implementation timeline and the impact of the "pregnant mother" model on student development?

- 5: 12.12%
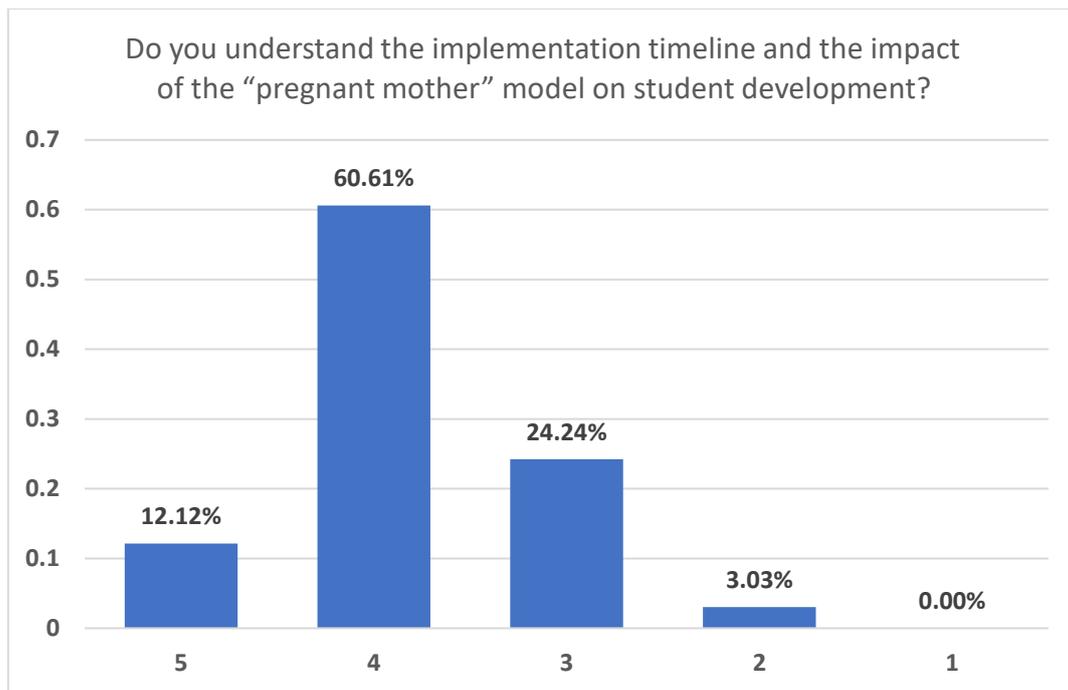- 4: 60.61%
- 3: 24.24%
- 2: 3.03%
- 1: 0.00%

Fig 4 : Comprehension Levels Regarding the 'Pregnant Mother' Model's Execution and Educational Impact

Figure 5 and Figure 6 examined the model's clarity and progressiveness. Most respondents agreed that the curriculum had clear objectives and a logical developmental flow. A majority (68.8%) rated levels 4 and 5 for clarity, while 57.6% showed moderate to high understanding of its progressive implementation through the pregnancy metaphor. These findings suggest that the "pregnant mother" framing effectively communicated structure and intent, consistent with holistic and constructivist principles that emphasise phased, outcome-based learning. According to Thoriq & Mahmudah (2023), effective curriculum development requires alignment across all components to achieve educational goals. The curriculum should not only express ideas but actively engage students in developing competencies relevant to technological advancement and future employment, fostering education for sustainable development.
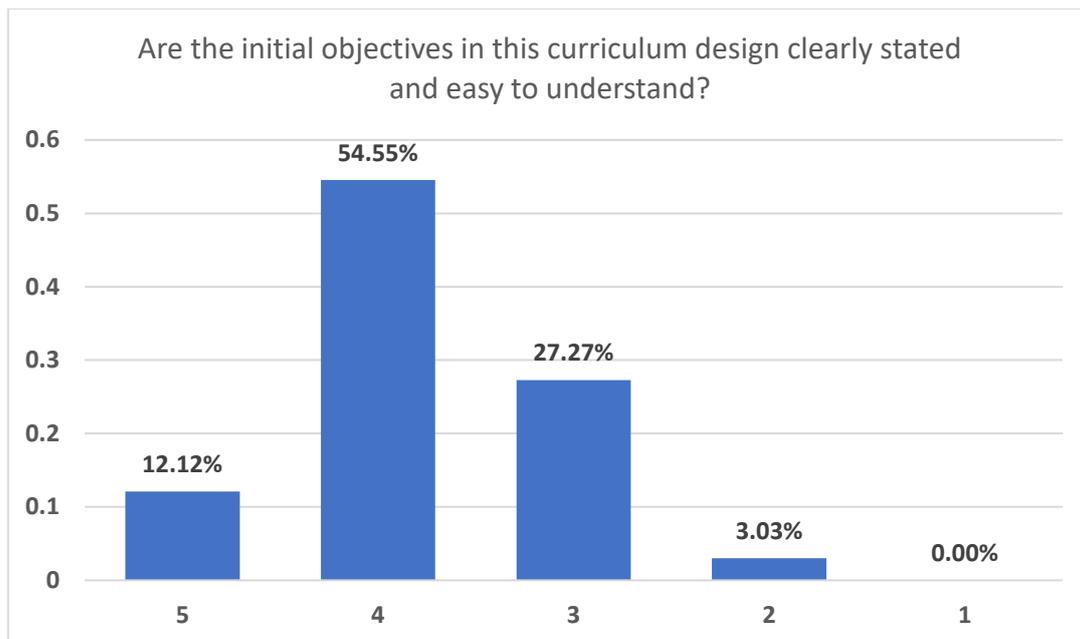
Fig 5 **:** Evaluation of Objective Clarity in Curriculum Design Model
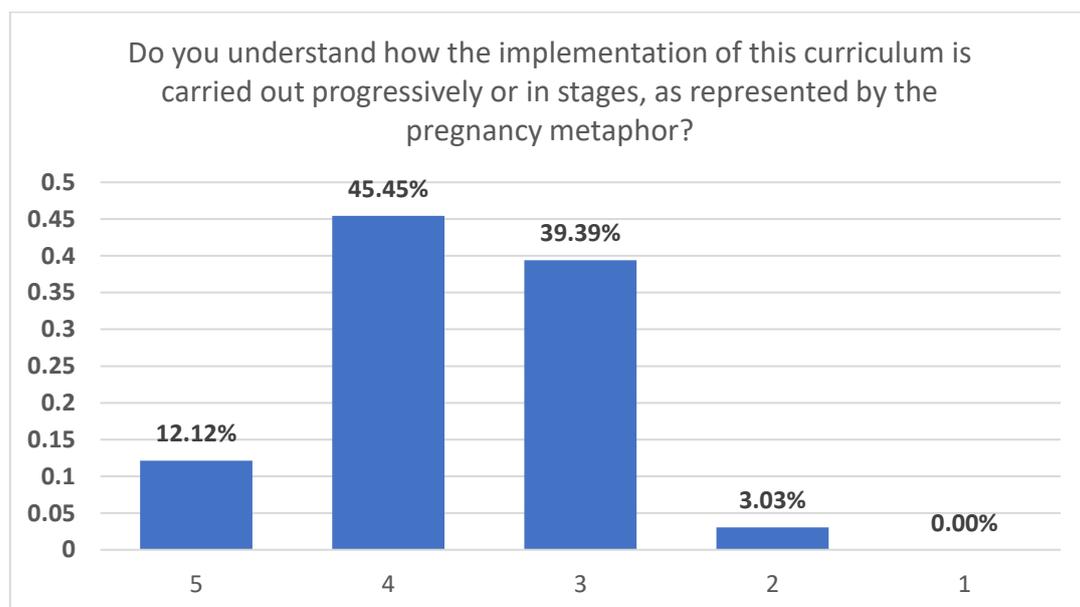

Fig 6 : Evaluation of Curriculum Implementation Phases Through Metaphorical Framing

Figure 7 shows how participants understood the Programme Educational Outcomes, or PEO, within the framework. Most respondents, 63.7%, rated their understanding as moderate to high. This suggests that the curriculum model communicates its goals effectively. About 36.4% chose the middle option, which shows that more clarity is needed on how the programme achieves these outcomes. These findings support Che Sohpy et al. (2023)'s view of constructive alignment, which emphasises the need for a holistic approach to competency assessment by integrating cognitive dimensions, skills, and attitudes to ensure effective educational delivery and the achievement of desired learning outcomes. The use of a metaphorical model, referred to as the "pregnant mother" approach, helped participants relate to the long-term nature of education. This framing made the concept more accessible and memorable.
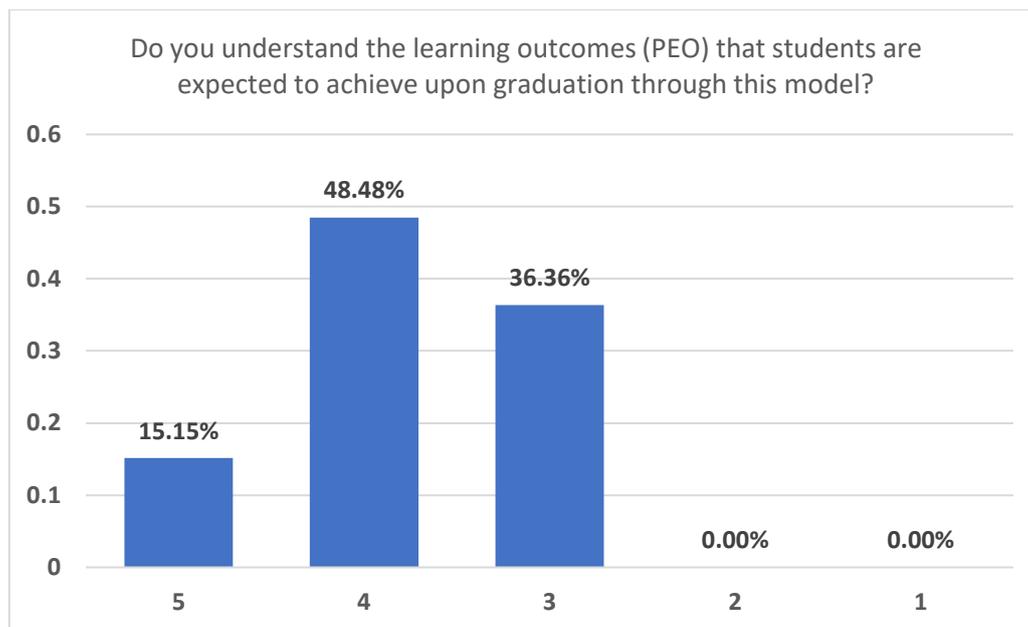
Fig 7 : Evaluation of Student Outcome Clarity in Curriculum Framework

Figure 8 and Figure 9 explored participants' views on the model's applicability and educational relevance. Responses showed strong agreement that the "pregnant mother" model is practical and supports holistic student development. Most respondents rated its real-world applicability positively (69.7%) and agreed it fosters comprehensive growth from entry to graduation (72.7%). These findings indicate that the metaphor enhances conceptual clarity while aligning with pedagogical expectations (Hailikari et. al, 2021). However, according to Vijayal, 2022, several other factors influence student motivation when this curriculum model is applied in real situations. These factors include students' background, learning goals or motivation, learning anxiety, interest in topics and content, and prior knowledge. Among these factors, learning motivation is the most important because the others are either influenced by it or influence it in return.
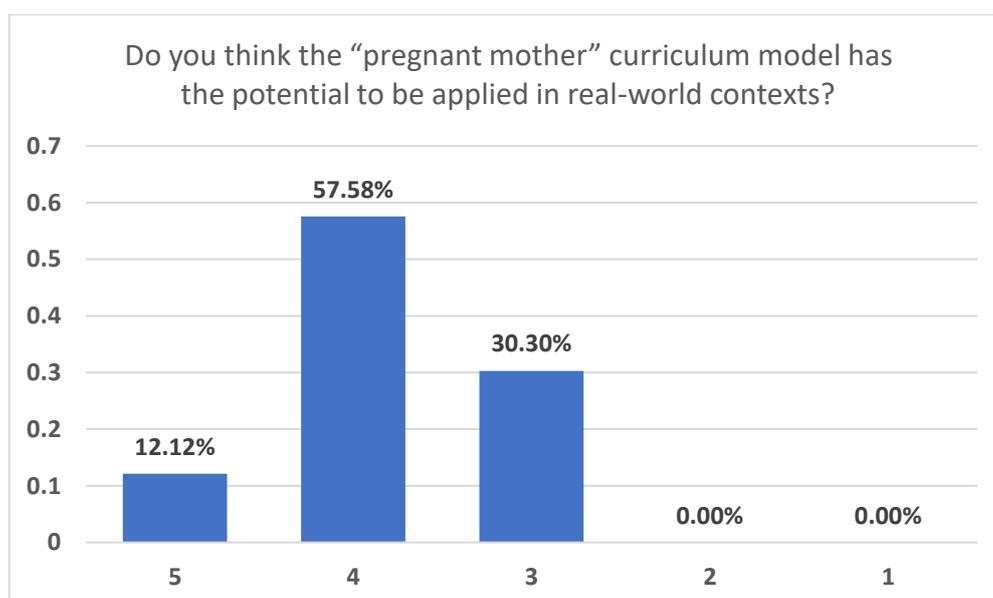

Fig 8 : Evaluation of Curriculum Model's Relevance to Authentic Educational Settings
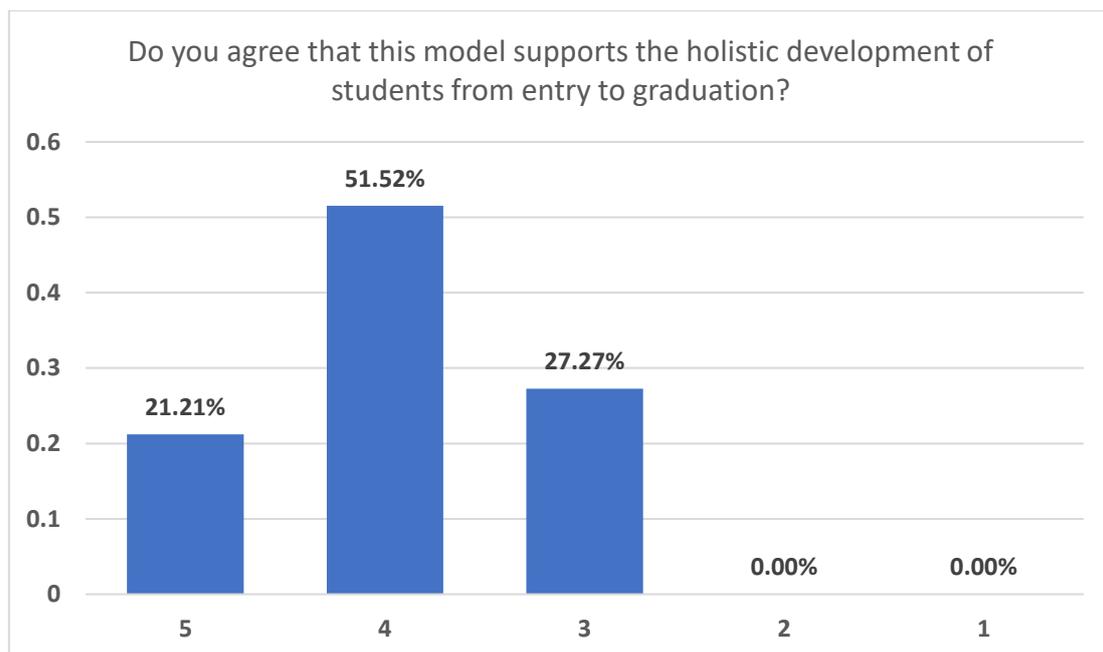
Fig 9 : Evaluation of the Curriculum's Capacity to Foster End-to-End Student Growth

Overall, the findings reveal both the potential and challenges of using metaphors in curriculum design. The "Pregnant Curriculum" metaphor effectively conveyed ideas of progression, growth, and holistic development, with most respondents showing strong comprehension. However, a few participants struggled to fully grasp or apply the metaphor, highlighting limits in universal clarity. This reflects critiques that metaphors, while generative, can oversimplify complex realities if used uncritically. The small sample size (n=33) and reliance on self-reported data also restrict generalisability. Future research should include larger, more diverse samples, integrate mixed methods, and test the model's practical use in classrooms. Future pacing proved particularly relevant. When participants projected the metaphor into real contexts such as visualising syllabus design through a gestation process as they demonstrated stronger conceptual retention and readiness for professional application (Schellings et. al, 2023). Such forward-looking reflection helps bridge theory and practice. In sum, clearly explained metaphors can serve as powerful cognitive tools in curriculum studies. Minor comprehension gaps suggest a need for additional scaffolding through concrete examples and guided reflection. Embedding future pacing may further strengthen long-term understanding and transfer into authentic educational practice.

Conclusion

In conclusion, the "Pregnant Curriculum" metaphor shows strong potential to enhance understanding of curriculum progression, outcomes, and holistic development. It was well received and resonated both culturally and conceptually, though it requires careful guidance from educators. Most participants demonstrated strong comprehension, with 57.6% rating level 4 and 24.2% rating level 5, while only 6.1% reported minimal understanding. This indicates that the metaphor effectively conveyed abstract ideas through a relatable image, helping participants view curriculum development as a gradual, nurturing process that simplifies complex concepts.

Overall, this study introduces the Pregnant Curriculum Metaphor as a tool to connect policy and practice in curriculum design. It integrates four key frameworks: Outcome-Based Education, Constructive Alignment, Backward Design, and Curriculum Metaphor Theory. The findings show that metaphorical framing helps educators improve understanding, reflection, and alignment. Well-applied metaphors can act as tools for reflection and innovation in curriculum design. The study also shows how ethics and identity can shape curriculum planning to produce balanced, work-ready graduates and supports sustainable, human-centred education aligned with SDG 4.

Acknowledgement

References

Foong, C. Y. (2024). Leadership and lifelong learning in higher education: Leading for learning in the Industrial Revolution 4.0 era. International Journal of Academic Research & Progressive Education & Development, 13(1).

Sim Siang Lin, G., & Muhamad Halil, M. H. (2024). Cultivating dental excellence: Advancing dental education in Malaysian higher institutions. *IIUM Journal of Orofacial and Health Sciences*, *5*(1), 85–89.

Ridzuan, M. R., & Abd Rahman, N. A. S. (2023). The analysis of the government policy on Technical and Vocational Education and Training (TVET) and the predicaments of TVET in Malaysia. *International Journal of Humanities Technology and Civilization*, *7*(1), 53–58.

Ngubane, P. B., Mbonambi, D. W., & Agara, O. A. (2025). Exploring experiences of TVET graduates' work-integrated learning in a rural ecology: The case of TVET colleges in KwaZulu-Natal.

Mitchell, J., Nyamapfene, A., Roach, K., & Tilley, E. (2019). Philosophies and pedagogies that shape an integrated engineering programme. *Higher Education Pedagogies*, *4*(1), 180–196.

Baş, G., & Sarpkaya, C. (2020). Perceptions of teachers about the curriculum: A metaphor analysis. *Istraživanja u pedagogiji*.

Chavez, J. C., Pit, N. N., & Napiere, M. B. (2023). Graduate school curriculum inquiry from the lens of the graduates: A single intrinsic case study. *British Journal of Multidisciplinary and Advanced Studies*, *4*(4).

Lynch, H. L., & Fisher-Ari, T. R. (2017). Metaphor as pedagogy in teacher education. *Teaching and Teacher Education*, *66*, 195–203.

Thoriq, A., & Mahmudah, F. N. (2023). Education for sustainable development (ESD): A systematic literature review on curriculum development strategy design. *European Journal of Education Studies*, *10*(5).

Che Sohpy, H., Che Keef, C. B., & Mohd Chekmeeri, N. R. (2023). The validity of the competency instrument for Construction Technology program lecturers in the practice of outcome-based education (OBE). *International Journal of Academic Research in Progressive Education and Development*, *12*(1).

Hailikari, T., Virtanen, V., Vesalainen, M., & Postareff, L. (2021). Student perspectives on how different elements of constructive alignment support active learning. *Active Learning in Higher Education*

Ismail, J. B., Tamby Chik, C., & Hemdi, M. A. (2024). TVET graduate employability: Mismatching traits between supply and demand. *International Journal of Academic Research in Business and Social Sciences*, *14*(1).

Schellings, G., Koopman, M., & Beijaard, D. (2023). Exploring metaphors and metaphorically written narratives in student teachers' professional identity work. *Education Sciences*, *13*(1).

Vijayal, B. (2022, December 12). *Malaysian tertiary students' perceptions of constructive alignment in learning in EAP classrooms: A qualitative study*.