
CoTech Learning Model: A Peer-Assisted Collaborative Framework for Inclusive Digital Marketing Education with Visually Impaired Learners

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Abstract

This paper presents the implementation of CoTech Learning Model, a peer-assisted collaborative teaching and learning framework to promote inclusive digital marketing education for the visually impaired individuals. This initiative is carried out as a result of funding from the Society of the Blind Malaysia, Sarawak Branch together with the collaboration of the researchers from Department of Information Technology and Communication in Politeknik Kuching Sarawak. This framework, includes TVET students as the learning partners as the participants in this initiative. As a whole, this model emphasizes equal participation, empathy and mutual skill development in the peer assists model integrating students with visually impaired throughout a series of hands on workshops. Overall, there are three workshops conducted to build core technopreneur skills among the participants: (1) poster design using Canva, (2) video marketing automation using AI-supported tools like CapCut, and (3) IoT-enabled hydroponic farming for sustainable business applications. Participants exhibited varying degrees of visual capability, which informed the design of flexible, accessible training methods that emphasized audio support, guided navigation, and real-time collaboration. The methodology emphasized empathy-driven pairing, multisensory instructional design, and real-world entrepreneurship. Effectiveness was assessed via Likert-scale surveys and participant reflections, with results showing exceptionally high satisfaction scores (96–99%) across content clarity, facilitation, and skill acquisition. This learning model not only closing the gaps of the learning abilities of the visually impaired personnel, also inculcates technopreneurial competencies, social integrations and digital empowerment among the participants. The results of this learning model indicated positives outcomes and this learning model is found scalable for future educational initiatives in integrating undeserved communities into the digital economy.

Keywords : *Inclusive education, CoTech Learning Model, Digital Marketing, Technopreneurship, peer-assisted learning*

I. INTRODUCTION

In this digitalization world, opportunities for entrepreneurship are growing, but not everyone has equal access to this technology, specifically, the visual impaired communities. Here, they often faced obstacles as there are limited access to adaptive tools, inclusive training and supportive mentorship. In Malaysia, this is obvious to show the needs of collaborative models that is able to bridge the gaps between technical education and social empowerment.

With that, the Society of Blind Malaysia, Sarawak Branch in collaboration with the Department of Information Technology and Communications in Politeknik Kuching Sarawak, initiated a community-driven technopreneurship research project designed to equip blind and visually impaired individuals with digital marketing competencies. This initiative was developed under a grant-funded project that integrates Technical and Vocational Education and Training (TVET) students as active partners, providing both technical support and peer mentorship throughout the learning process. To facilitate this collaboration, the project introduced the CoTech Learning Model—a structured peer-

assisted teaching and learning framework that fosters empathy, equal participation, and mutual skill development. Under this model, each visually impaired participant is paired with a TVET student partner, enabling accessible, hands-on learning experiences tailored to various levels of visual capability. The program's design was rooted in real-world applications, addressing not only digital inclusion but also entrepreneurial self-reliance through a series of outcome-oriented workshops. Three main training modules formed the foundation of the program: (1) poster design using Canva, (2) automated video production using CapCut and AI tools, and (3) the integration of IoT-based hydroponics as a sustainable business model. These workshops were strategically selected to provide participants with a comprehensive understanding of digital branding, content creation, and smart agriculture—all aligned with modern technopreneurial practices. This paper explores the development, implementation, and impact of the CoTech Learning Model. It highlights how inclusive collaboration, supported by digital tools and peer mentorship, can transform traditional educational environments into empowering spaces for both TVET students and visually impaired individuals. The research also examines feedback from participants, analyzes the effectiveness of the model, and presents recommendations for scaling such inclusive frameworks within other educational and community-based contexts.

II. LITERATURE REVIEW

The main focus of this project is the development of the CoTech Learning Model—a peer-assisted learning framework where polytechnic students are paired with blind participants in a one-to-one or small team-based mentorship arrangement. This model promotes active engagement, empathy, and collaborative learning, leveraging each individual's strengths while fostering mutual respect and shared ownership of outcomes. The diversity among the visually impaired participants, who varied in the degree of sight impairment—from minimal to partial vision—necessitated a flexible and inclusive approach to content delivery and workshop facilitation. Over the course of the year-long program, three major workshops were conducted to build relevant, future-ready competencies: Poster Design using Canva – This module introduced basic principles of graphic design and branding using an accessible, user-friendly platform. Students guided their blind peers in conceptualizing business posters, with emphasis on storytelling, layout, and digital aesthetics. Automated Video Creation using CapCut and AI tools – This workshop focused on video editing and voiceover generation, integrating AI-

based tools to streamline content creation. It enabled participants to craft promotional materials for their products or services with minimal technical complexity. Hydroponic Farming using IoT – Participants were introduced to smart agriculture concepts by learning to manage a hydroponic system equipped with IoT sensors and Raspberry Pi automation. This module not only served as a practical application of Industry 4.0 but also provided a sustainable business model that participants could adopt post-training.

Through this integrated and inclusive approach, the project addresses not only the skill gaps among visually impaired individuals but also fosters a culture of empathy, creativity, and innovation among TVET students. It exemplifies how inclusive pedagogy, when combined with relevant technology and real-world applications, can break down barriers and unlock entrepreneurial potential across diverse communities. As such, this initiative represents a scalable model for future inclusive education programs in Malaysia and beyond. Jaeger in his book discussed the digital divide faced by people with disabilities and how the technology can be more inclusive [4]. The author emphasized that digital inclusion is not merely a technical issue but also a social justice concern. He calls for the integration of accessible design into all stages of technological development and stresses the importance of policies that enforce digital accessibility as a right rather than a privilege. He also critiques the slow implementation of accessibility legislation, even in technologically advanced nations, noting that the gap is even wider in developing contexts like Malaysia.

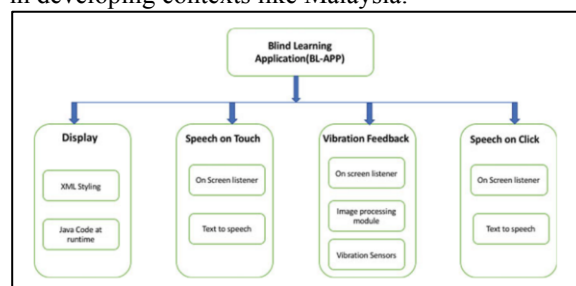


Figure 1: Learning application for the Blind [9]

Figure 1 showing the Blind Learning APP (BL-APP) is designed with an intuitive interface that allows users to easily locate and interact with buttons on the screen [9]. It employs text-to-speech technology to convey text descriptions and provides vibratory feedback to help users visualize shapes. The EFORD application, developed for English learning, includes features validated by media experts and special needs teachers, achieving high feasibility scores. It focuses on grammar and speaking skills, providing a tailored learning experience for visually impaired students.

There are many learning models launched for the people with visually impaired, namely:

- i. Listen to the models: Sonified learning models for people who are blind [6]. This model applies sonification, which is the process of converting data into sounds, enhancing the learning experiences for people who are blind. This approach not only aids in understanding complex scientific concepts but also supports the inclusion of blind students in mainstream educational curricula.
- ii. E-learning model for blind disabilities with text to speech using NLP [3]. This model focuses on creating an accessible elearning environment with visual impairs integrating Learning Management System to manage learning activities and a conversion process to transform text-based course materials into audio files using Text-to-Speech technology.
- iii. Teaching life sciences to blind and visually impaired learners [2]. This learning model using cooperative learning strategies to teach life sciences to the visually impaired learners. The study revealed that blind and visually impaired learners face significant challenges in applying science process skills due to their lack of vision, confidence, and motivation.

Practical activities were limited and often lacked intellectual challenge, with learners rarely participating in practical work or field trips.

Various innovative approaches have been developed to support the learning needs of blind and visually impaired individuals involves converting visual information into sound to help learners understand complex scientific concepts through auditory perception; text-to-speech technology within an online learning environment, transforming written content into audio to improve accessibility and engagement; cooperative learning techniques have been applied to foster collaboration and inclusion, although challenges such as limited confidence, motivation, and access to hands-on activities remain. Together, these approaches highlight the importance of multisensory engagement, accessible digital tools, and supportive peer interactions in enhancing educational outcomes for visually impaired learners.

Without the involvement of sighted peers as learning partners, these approaches may miss opportunities to foster social integration, mutual understanding, and collaborative problem-solving. The absence of peer support can also limit the development of soft skills, such as communication and teamwork, which are essential for real-world application. Integrating peer-assisted learning could enhance these models by creating a more inclusive

and interactive educational experience that benefits both visually impaired learners and their sighted [1][7][8][10].

III. RESEARCH METHODOLOGY

The CoTech Learning Model was implemented through a structured, multi-phase methodology combining instructional design, inclusive pairing mechanisms, workshop facilitation, and digital resource development. The framework adopted a peer-assisted approach, whereby each visually impaired participant was paired with a TVET student from the Department of Information Technology and Communication, Politeknik Kuching Sarawak to form a collaborative learning unit. This pairing was matched based on communication skills, patience, and willingness to assist, ensuring both participants could mutually benefit from the exchange. The implementation was divided into three main stages: preparation, delivery, and reflection. During the preparation phase, facilitators and content experts developed accessible training materials tailored to different levels of visual impairment, ensuring audio descriptions, tactile prompts, and screen-reader compatibility were embedded within the learning content. The delivery phase involved three hands-on workshops: (1) poster design using Canva, (2) automated video production using CapCut and AI tools, and (3) hydroponics using IoT systems. Each workshop followed a blended learning model combining demonstrations, guided practice, and project-based assignments. Facilitators monitored interactions between student and blind participants to ensure effective knowledge transfer, inclusion, and progress. In the final phase, reflective discussions and feedback sessions were conducted to assess individual learning, group synergy, and areas for refinement. Effectiveness was measured through Likert-scale questionnaires and open-ended reflections, focusing on digital competency development, peer engagement, and motivation to apply new knowledge. The entire methodology was guided by inclusive pedagogical principles, underpinned by collaborative learning theory, and aligned with Industry 4.0 education objectives.

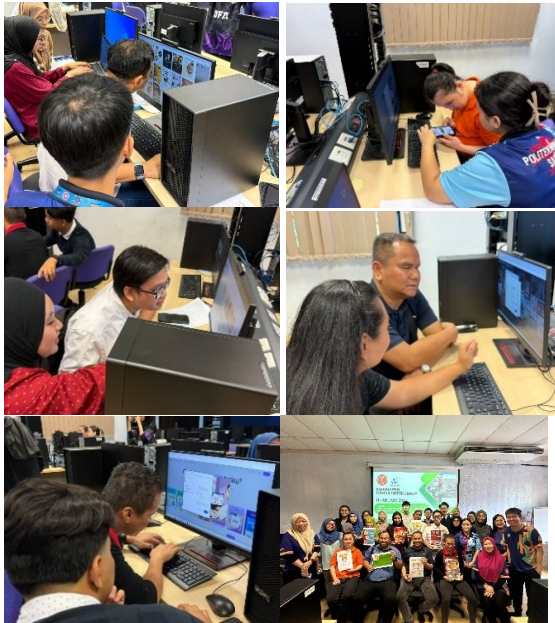


Figure 2 Collection of photos during the teaching and learning for the Canva and Video Creation workshop

Figure 2 showing CoTech Model implemented for the teaching and learning session with the visually impaired personnel. This model implemented peer-assisted, inclusive and experiential learning model. In this model, each visually impaired participant is paired with a sighted student from the Department of Information Technology and Communication. For the first two workshops, designing poster using Canva and also video editing using CapCut, actual business-related tasks is used to show the real-world relevancy of the workshop. Computer stations, mobile phones and tablets are the assistive and adaptive technology supports to accommodate different levels of visual ability. The physical layout and instructional design foster equality in participation, where both students and blind participants contribute ideas and collaborate creatively. Here, the student partner acts as a learning facilitator and collaborator, not a teacher—fostering mutual respect and shared ownership of the learning process



Figure 3 Collection of photos during the teaching and learning for the Hydroponic using IOT workshop

Figure 3 showing hydroponic workshop conducted under the CoTech Learning Model, showcasing a peer-assisted, inclusive learning environment where TVET students collaborate closely with visually impaired participants. Through hands-on activities such as assembling vertical hydroponic systems, inserting irrigation components, and preparing planting structures, both groups engage in mutual learning and skill-building. The visually impaired participants are actively involved in every step, guided by their sighted peers through verbal instructions, tactile feedback, and empathetic support. This interaction reflects the core principles of the CoTech model—equal participation, empowerment, and collaboration—while fostering technical competency, confidence, and social inclusion. The workshop not only builds practical skills but also nurtures empathy, teamwork, and mutual respect among all participants.

RESULT AND DISCUSSION

The effectiveness of CoTech Learning model is measured through the questionnaires as Table 1 below, using Likert scale, 1-5:

Table 1: Questionnaire Items and Descriptions

No	Item	Description
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i.	The program announcement attracted my attention	High scores suggest effective outreach through inclusive and accessible promotional strategies. This reflects the CoTech model's emphasis on engaging all learners equally from the start, ensuring the blind community and students are equally informed and motivated.
ii.	The announcement was made early and gave me enough time to prepare	Participants appreciated the timely communication, a key strength in the CoTech model where both students and blind partners must coordinate. Early notice enhances preparation and peer interaction, encouraging proactive collaboration
iii.	The program information was delivered clearly and easy to understand	The clarity of instructions aligns with the CoTech model's value on accessibility. Information was likely delivered through both visual and assistive formats, ensuring comprehension for visually impaired learners without compromising technical depth for students.
iv.	The program ran smoothly without any changes	Smooth execution shows strong planning and inclusive design. In CoTech, synchronized participation between sighted students and blind peers is crucial, and a disruption-free experience supports their equal involvement.
v.	The program committee demonstrated professionalism	This reflects how CoTech fosters an environment of respect, structure, and responsibility—essential when working with participants of varied abilities. Professionalism ensures that diverse learning needs are handled sensitively and efficiently.
vi.	Facilitators helped me understand the program's objectives and impact	This item's high rating highlights the facilitators' success in explaining complex content to a mixed-ability audience—central to CoTech's pedagogical strategy. It

		confirms that facilitators could guide both students and blind learners to see value in their learning
vii.	The facilities provided were sufficient for participant needs	Adequate facilities—such as screen readers, tactile guides, and accessible venues—are critical in the CoTech model. This result shows logistical success in catering to diverse physical and technological needs.
viii.	The program added value to my knowledge or skills	CoTech encourages skill acquisition through peer-assisted tasks. High agreement here suggests that both groups—blind and sighted—benefited from hands-on digital marketing, video editing, and IoT sessions.
ix.	The program motivated me to apply what I learned	The motivational impact stems from CoTech's real-world relevance and peer-driven support. Participants likely saw direct value in using tools like Canva, CapCut, or IoT systems to promote or manage real businesses or projects.
x.	The program increased my sense of responsibility and awareness	Working alongside peers with different abilities fosters empathy and responsibility—two key outcomes of the CoTech model. This result suggests growth not just in technical skill, but also in character and collaborative mindset.

The survey utilized a 5-point Likert scale to measure participant satisfaction and the effectiveness of various aspects of the workshops. Each item was rated from 1 to 5, where a score of 1 indicated "Strongly Disagree" or "Very Ineffective," while a score of 5 represented "Strongly Agree" or "Very Effective." This scale provided a structured and standardized approach for participants to express their level of agreement with statements related to program announcements, facilitation quality, content clarity, and overall learning experience. The overwhelmingly high ratings, predominantly in the 4 and 5 range, reflect a strong consensus that the workshops were both impactful and well-executed. The use of the Likert scale thus reinforces the reliability of the data and offers clear evidence of the program's success in achieving its objectives.

Table 2 Summary of result from the questionnaire survey

Item	Mean Score	Percentage (%)	Effectiveness Summary	CoTech Model Relevance
Program announcement attracted attention	4.80	96.0%	Very effective – Engaging outreach for all participants	Ensures inclusive initial engagement
Announcement was timely	4.80	96.0%	Very effective – Promoted preparation and coordination	Supports peer readiness and coordination
Information was clear and easy to understand	4.95	99.0%	Very effective – Inclusive and accessible delivery	Accessible content for mixed-ability learners
Program ran smoothly without changes	4.95	99.0%	Very effective – Smooth, inclusive execution	Critical for equal participation
Committee showed professionalism	4.95	99.0%	Very effective – Respectful, structured learning space	Builds inclusive, respectful learning culture
Facilitators helped understanding	4.95	99.0%	Very effective – Clear facilitation for diverse learners	Empowers learners with diverse needs
Facilities were sufficient	4.95	99.0%	Very effective – Accessible and adequate facilities	Caters to physical and tech accessibility
Program added value to skills	4.95	99.0%	Very effective – Strong skill development	Enables experiential, skill-based learning
Program motivated learning application	4.95	99.0%	Very effective – Practical, motivating content	Links learning to real-world impact
Increased responsibility and awareness	4.95	99.0%	Very effective – Fostered empathy and collaboration	Develops character through collaboration

Table 2 showing the survey result from the three workshops conducted under the Cotech Learning Model, the overall effectiveness of each session is ranged within a consistently high participant ratings. Across 10 evaluated items, mean scores ranged from 4.80 to 4.95 out of 5, from 96% to 99% satisfaction, indicating positive response. Participants found the program announcements engaging and timely, enabling adequate preparation, which reflects the model’s commitment to inclusivity from the outset. Information was communicated clearly, and all programs ran smoothly, highlighting strong planning and accessibility for both visually impaired and sighted participants. High professionalism by the organizing committee and the ability of facilitators to convey objectives effectively showcase the model’s emphasis on respectful and supportive environments. The training enhanced their sense of responsibility and awareness—core values embedded in the CoTech Learning Model. These results confirm that the model not only supports technical skill acquisition but also fosters mutual growth, empathy, and collaboration between diverse learners, establishing it as a highly trustworthy and impactful educational framework. This national action plan serves as a key government policy document to promote and protect the rights of persons with disabilities (OKU) in Malaysia. Aligned with the UN Convention on the Rights of Persons with Disabilities (CRPD), the Pelan Tindakan OKU 2016–2022 outlines strategic focus areas, including education, employment, accessibility, ICT, and community participation. Here, the key initiatives achieved in this research includes:

- i. **Enhancing Access to Inclusive Education:** The plan emphasizes the need to improve access to quality education for OKU by integrating inclusive education practices within mainstream schools and institutions. This includes adapting curricula, training educators, and providing necessary support services to accommodate diverse learning needs.
- ii. **Promoting Digital Literacy:** Recognizing the importance of digital skills in the modern economy, the plan advocates for programs that enhance digital literacy among OKU. This involves providing training on the use of information and communication technologies (ICT) and ensuring that digital content is accessible.
- iii. **Developing Accessible Infrastructure:** The action plan calls for the development and implementation of accessible infrastructure in educational settings. This includes the use of assistive technologies and the design of learning environments that cater to the needs of students with disabilities.
- iv. **Strengthening Collaboration:** The plan encourages collaboration between government agencies, non-governmental organizations (NGOs), and the private sector to develop and implement programs that support the education and digital inclusion of OKU.

In the context of education and digital inclusion, this initiative acknowledges that persons with visual impairments face some obstacles to equitable access. It highlights the urgency of creating inclusive learning environments, investing in assistive technologies, and ensuring that digital content and platforms are usable by all. The second initiatives highlighted inter-agency collaboration—including educational institutions, NGOs, and

industry players—to design programs that foster empowerment through skills and knowledge. Thus, this supports the objectives of CoTech Learning Model through the structured peer-supported training particularly integrating the TVET teaching and learning model. This validates the use of digital tools such as AI, Canva, CapCut in workshops together with the involvement of diploma students are effective and relevant as inclusive partners in this model. Recent literature highlight that the critical role of technological utilization and peer-assisted strategies in promoting inclusive digital learning for visually impaired individuals. The authors, Tsouktakou et al., mentioned that AI-powered platforms significantly enhance autonomy and engagement among blind learners and the importance of intuitive design and integration with assistive technology [11].

IV. CONCLUSION

In conclusion, the survey results provide strong evidence of the effectiveness and impact of the workshops conducted under the CoTech Learning Model. With average scores ranging between 96% and 99% across all items, participants expressed a high level of satisfaction with the program's delivery, content, facilitation, and overall learning experience. The positive responses demonstrate that the CoTech Learning Model successfully met the needs of both TVET students and visually impaired participants by fostering an inclusive, supportive, and collaborative learning environment. The CoTech model not only enhanced technical and entrepreneurial skills but also promoted empathy, responsibility, and mutual respect among participants. These outcomes validate the model's potential for broader implementation in inclusive education initiatives and affirm its role in bridging accessibility with innovation in digital marketing. It is recommended to replicate the CoTech Learning Model in other institutions, expand the workshop content with advanced digital tools, develop structured peer support guidelines, enhance accessibility features, establish post-workshop mentorship systems, and document best practices to ensure long-term impact and broader adoption. Although the current study relied primarily on post-workshop Likert-scale assessments and qualitative reflections, future implementations of the CoTech Learning Model will incorporate pre- and post-tests to quantitatively measure improvements in digital literacy and entrepreneurial readiness.

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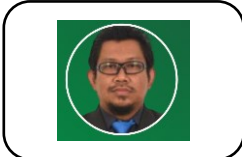
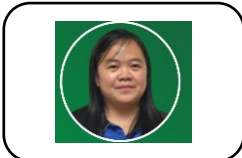
for the approved fund which makes this important research viable and effective

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