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Adapting the Future VET Curriculum in Response to Emerging Challenges: A Model for Evaluating the Impact of AI Integration in VET for Armed Conflicts and Warfare

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ABSTRACT: This article examines the profound implications and the transformative impact of artificial intelligence (AI) on vocational education and training (VET) within military contexts, underscoring the imperative for curriculum reform to address the evolving demands of contemporary warfare. As AI technologies progress, they present both significant opportunities and challenges, reshaping defense strategies and operational frameworks, fundamentally altering defense strategies and operational paradigms. The integration of AI into military applications necessitates a workforce proficient in specialized competencies, including technical expertise in AI ethics, system design, and human-centered methodologies. This paper delineates the essential competencies required for future VET professionals, emphasizing the necessity for ongoing upskilling and reskilling to effectively navigate the ethical and legal complexities associated with AI in military operations. By incorporating and embedding AI education into VET curricula, stakeholders can cultivate a new generation of defense professionals equipped to utilize AI technologies in a responsible and effective manner, ensuring adherence to and compliance with international humanitarian standards while enhancing operational efficacy. The findings highlight the critical role of VET in developing a skilled workforce prepared to confront the dynamic landscape of military technologies driven by AI.

KEYWORDS: Artificial Intelligence, Military Applications, Evaluation Model, VET.

INTRODUCTION

Overview of the Context

Artificial Intelligence (AI) has experienced exponential growth in fields such as education, healthcare, transportation, and defense in recent years. Its applications range from improving healthcare diagnostics and optimizing industrial processes to transforming how nations conduct security and warfare. Particularly in defense, AI has introduced novel approaches to combat, where humans may no longer need to be physically present on the battlefield, developing different “cyber weapon” including its benefits and risk (*Zirojević, 2024*). AI-driven technologies—such as autonomous weapons, cyber defense systems, and real-time intelligence gathering—are reshaping how wars are fought and managed. In essence, vocational education and training (VET) plays a crucial role in ensuring that industries like defense have a skilled workforce ready to respond to evolving market demands. Traditionally, VET focuses on equipping students with industry-specific skills for particular occupations. However, as new technologies like AI emerge, VET curricula must adapt to incorporate these advancements. Training the next generation of technicians, engineers, and operators capable of handling AI-driven defense technologies presents significant challenges. To address this, VET must be updated to include AI competencies, especially its crucial complements to AI's predictive capabilities (*Goldfarb & Lindsay, 2022*) ensuring that future defense professionals are not only technically proficient but also equipped with the ethical insight necessary to manage AI's expanded role in modern conflict—balancing operational efficiency with adherence to international humanitarian norms and standards.

Significance of the Topic

Learning about the role of AI in warfare is crucial not only due to its practical military applications but also because of the broader ethical and legal considerations it raises. While AI-enhanced defense systems offer significant benefits, concerns around autonomous decision-making in lethal operations and the protection of civilian lives during armed conflict require careful balance (*Hadlington et al., 2023*). Therefore, individuals entering the defense industry must be trained in the responsible and ethical use of

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these technologies. By embedding AI competencies into VET curricula, stakeholders ensure that future professionals are equipped to navigate the complexities of AI in warfare, addressing its technical, ethical, and legal dimensions.

METHODS AND METHODOLOGY

Research Design

This research employs a qualitative methodology, focusing on in-depth exploration of the experiences and perspectives of key stakeholders involved in VET programs, as well as a thorough examination of secondary data. The primary objective is to understand the challenges, competencies, and ethical considerations associated with AI integration with military prospects in VET training programs. The detailed examination of how AI is reshaping VET education, particularly within the military context, and the broader implications for stakeholders, necessitates a qualitative approach to capture the depth and richness of these experiences. Methods or approaches used in the article to explore the integration of AI into VET within military contexts are.:

1. *Literature Review*
2. *Development Conceptual Framework in VET*
3. *Development Model for Evaluating the Integration of AI into the VET Curriculum*
4. *Recommendations for Simulated Training Environments for AI technologies in Military Scenarios.*
5. *Stakeholder Engagement*

Evolution of VET and Emerging Challenges

Historical Context of VET

Vocational education and training (VET) have long been tied to industrial development. Initially, VET was designed to equip individuals with trade skills such as carpentry, plumbing, and machinery operation (*Clarke et al., 2020; Chan, 2020).* However, it has evolved in response to technological advancements. For instance, in the early 20th century, with the rise of industrialization, vocational schools expanded their offerings to include emerging technologies like mechanical engineering and manufacturing. Later, with the digital revolution in the late 20th century, VET programs began incorporating IT skills, programming, and automation into their curricula to better prepare students for increasingly digitalized work environments. VET's evolution highlights its adaptability in meeting the demands of changing technological landscapes, ensuring that the workforce remains relevant and skilled.

As technology evolves, particularly with automation and digitalization, various challenges arise, including the need to update skills. For example, the rise of computer-aided design (*CAD*) and CNC machines in manufacturing has compelled VET programs to teach students mechanical and software skills. Similarly, the increasing integration of robotics in logistics and production requires VET to adapt its curricula, ensuring graduates are competent in operating machines and managing system programs effectively. The ongoing evolution emphasizes the importance of continuous learning and adaptation within vocational education to meet the demands of a rapidly changing technological landscape. AI is revolutionizing vocational education by enhancing teaching efficiency and effectiveness (*Suparyati et al., 2023*). AI enables personalized learning experiences, adaptive curricula, and automated performance assessments, allowing educators to focus on student development (*Yahya et al., 2023; Suparyati et al., 2023*). The integration of AI in vocational education involves resource network technology and intelligent systems, empowering traditional education practices (*Yanrong, 2021*). While AI offers numerous benefits, challenges such as potential educational inequalities due to biased algorithms and unequal access to AI-powered resources must be addressed (*Ejjami, 2024*). To successfully implement AI in vocational education, significant investments in infrastructure, ongoing professional development for educators, and the creation of specialized positions like Vocational AI Curriculum Developers are necessary. As AI continues to evolve, its integration with vocational education is crucial for preparing students for the changing job market and promoting sustainable development in the field (*Yanrong, 2021; Suparyati et al., 2023*).

Challenges of AI in Warfare

AI applications not addressed by VET systems present new challenges within military contexts, including data privacy and moral issues. Unlike other technological advancements, these applications introduce unique ethical dilemmas and technical requirements (*Ams, 2023*). For instance, autonomous drones can execute complex missions without direct human involvement, raising accountability concerns, particularly in cases of civilian casualties. Similarly, AI-driven surveillance systems process vast amounts of data for intelligence purposes, leading to legal and ethical issues regarding privacy and civil liberties. The future workforce will need various technical skills related to AI, including machine learning, data analysis, robotics, and cybersecurity (*Aicardi et al.,*

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2021). Therefore, VET curricula must be adapted to incorporate these competencies, enabling professionals to work effectively with AI-driven military technologies in operational and development roles. Given the rapid advancement of AI, continuous updates to curricula will be essential to meet the evolving demands of the industry.

AI and Warfare: Key Areas of Impact

Autonomous Systems and Drones

One of the most critical applications of AI in modern warfare is autonomous systems. Autonomous systems include robotic ground units, which can also act as uncrewed aerial vehicles (UAVs)- drones and autonomous underwater vehicles (AUVs) and can perform missions without human input (*Johansson, 2018*). AI enhances these systems, enabling them to make real-time decisions, navigate challenging environments, and perform complex tasks, such as target identification, logistics support, and reconnaissance missions. The benefits of autonomous systems are reduced risk to human soldiers and increased operational efficiency, but there is concern over the loss of human oversight (*Erskine & Miller, 2024*). In some situations, autonomous systems may undertake life-or-death decisions without human involvement, thus breaching international humanitarian laws, such as the Geneva Conventions, which establish rules for combatants that do not necessarily hold for autonomous machines and raise questions of accountability when these systems fail or malfunction. Therefore, while autonomous systems in modern warfare offer significant operational efficiency and risk reduction advantages, they also present profound ethical challenges that necessitate careful regulation and oversight to ensure compliance with humanitarian laws. VET programs that teach AI integration into such military technologies could prepare technical skills l to operate, manage, and defend these systems in a conflict setting.

Cybersecurity and AI

Cybersecurity is becoming increasingly critical, with AI playing a dual role—both offensive and defensive—in modern military cyber strategies. AI can detect and neutralize cyber threats more quickly than human operators can identify vulnerabilities or thwart cyberattacks (*Shaji George, 2024*). However, adversaries are also leveraging AI to develop more advanced forms of cyberattacks, resulting in an ongoing arms race. This reality underscores the necessity of integrating cybersecurity and AI skills into VET programs (*Sindiramutty, 2024*). To adequately prepare future defense professionals for the realities of operating AI systems, they must understand how to deploy these technologies while protecting them from cyber threats. Training students in AI-driven cybersecurity technologies can bolster a military's ability to defend against cyber attacks during conflicts. Thus, VET institutions must prioritize combining AI and cybersecurity in their curricula to equip graduates to defend military systems against increasingly sophisticated digital attacks.

Intelligence and Surveillance

Although advanced data analytics are transforming intelligence gathering and surveillance with AI, they are associated with various moral issues. Now, military organizations can move vast quantities of data, from satellite imagery to social media—at speeds and scales far beyond what humans can achieve (*Zong & Guan, 2024*). The data provides AI-driven intelligence systems that can parse through it to spot patterns, track targets, and foresee threats. However, using AI in this manner carries severe ethical issues, including privacy and data protection concerns (*Vashishth et al., 2024*). For instance, civil liberties are threatened by surveillance technologies that can track people and analyze their digital footprints when misused. AI can analyze satellite images, intercepted communications, and other intelligence sources faster and more accurately than human analysts. VET programs that include training in AI-driven intelligence tools can significantly enhance a military's capacity to detect and respond to threats. It can also be used in surveillance drones, facial recognition, and behavior analysis, providing real-time monitoring of enemy activities. Training personnel in the use of these technologies can improve operational effectiveness during mobilizationTherefore, it is essential to train VET professionals in the defense sector to resolve these ethical dilemmas, and this involves integrating discussions of data ethics, privacy legislation, and international human rights regulations in the VET curricula.

AI in Strategy and Decision-Making

The impact of AI on warfare extends beyond threat recognition and neutralization. AI profoundly influences strategic planning and battlefield decision-making (*Ekelhof, 2024*). AI systems can analyze battlefield conditions in real time, providing data-driven insights that inform tactical decisions. In some cases, AI can predict enemy movements, guide deployment strategies, and even optimize resource allocation. However, while these capabilities offer clear advantages, they also pose significant risks, especially

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when critical decisions are delegated to AI systems without proper human oversight. Consequently, VET curricula must focus on developing AI systems for strategic defense purposes, ensuring that future defense professionals can design, deploy, and evaluate AI-driven decision-making tools. Additionally, training must cover the potential risks of AI, such as biased algorithms or faulty data that could impact critical military decisions, as well as facilitating early detection even of of health issues during conflicts (*Albadrani et al., 2024*). In summary, AI integration into defense requires a balanced approach emphasizing its strategic potential and inherent risks.

Speed and Efficiency in Mobilization

AI can improve the speed and efficiency of military mobilization efforts, helping to organize personnel, supplies, and logistics more effectively. For instance:

1.*Supply Chain Management:* AI can optimize military logistics by predicting and streamlining the delivery of weapons, food, and medical supplies. A workforce trained in AI and logistics via VET programs will be critical in ensuring that resources are deployed efficiently during conflict.

2.*Decision Support Systems:* AI can assist military leaders in making faster, more informed decisions by analyzing data and providing real-time insights. VET programs teaching the use of AI-based decision systems can enhance the readiness of military commanders and their staff.

Impact on Workforce Structure

The integration of AI in VET could change the structure of the military workforce. AI integration might reduce the need for certain traditional combat roles while increasing demand for technical experts capable of managing AI systems. This shift could affect recruitment strategies and the composition of the military workforce during times of conflict. It requires *Upskilling and Reskilling*; with the growing role of AI, military personnel would need continuous upskilling or reskilling. VET programs focused on AI will help ensure that military forces are prepared for the evolving technological landscape of modern warfare.

Model for Evaluating the Integration of AI into the VET Curriculum

Defining Key Competencies

The AI-related competencies essential for future VET professionals focus on building their knowledge of AI ethics, AI applications and techniques, AI system design, and AI as a human-centered discipline (See ***Table 1***). The human-centered aspect focuses on the values, critical thinking skills, and beliefs of trainees as concerns AI's appropriateness for purpose, including how people should interact with it and the responsibilities of various stakeholders in developing just, inclusive, and safe AI communities (*UNESCO, 2024*). Key competencies under this aspect include human agency and accountability. The former requires trainees to protect human rights in the design and use of AI, whereas the latter invokes their understanding of their legal and social responsibility when utilizing AI in decision-making.

Table 1. Proposed Educational Framework for VET Students: Conceptual Divisions

AREA	KNOWLEDGE FOR	APPLICATION	ACTIVITIES
HUMAN	HUMAN AGENCY	HUMAN ACCOUNTABILITY.	SOCIAL RESPONSIBILITY IN AI DEPLOYMENT.
ETHICS	APPLYING ETHICAL PRINCIPLES IN AI DEPLOYMENT.	RESPONSIBLE AND SAFE USE OF AI TOOLS.	INCLUDING ETHICAL PRINCIPLES IN THE DESIGN OF AI SYSTEMS.
TECHNOLGY	CONCEPTUAL AI KNOWLEDGE AND RELATED OPERATIONAL SKILLS.	APPLICATION SKILLS	DEVELOPING AI TOOLS
SYSTEMS DESIGN	PROBLEM-IDENTIFICATION.	ARCHITECTURAL DESIGN	INCORPORATING FEEDBACK AND ITERATION IN THE DESIGN OF AI SYSTEMS.

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The AI ethics aspect will focus on the embodied reflections, ethical value judgments, and emotional intelligence skills necessary to apply AI systems appropriately and sustainably. Key competencies include applying ethical principles in using AI systems. Specifically, learners will understand and internalize concepts like doing no harm, non-discrimination, sustainability, safe and responsible use, transparency, and proportionality (*UNESCO, 2024*). Since the ethical scope of AI is growing, trainees must have excellent knowledge of underlying ethical issues and principles.

The AI applications and techniques aspect centers on conceptual AI knowledge and related operational skills. Learners must examine exemplary AI tools to understand their development based on algorithmic data (*UNESCO, 2024*). Here, they will build foundational AI knowledge through programming and data analysis skills. Moreover, they must be competent in critically evaluating and leveraging AI tools like data sets and programming libraries. With this understanding, they would build a third competency for creating task-based AI tools from existing toolkits and data.

As the fourth aspect of this model, AI system design will ensure learners develop comprehensive engineering and systemic design thinking skills crucial for optimizing AI systems. One critical competency is cultivating the technical knowledge needed to configure reusable, maintainable, and scalable AI system architecture covering data layers, application interfaces, and models (*UNESCO, 2024*). Another skill concerns understanding problem scoping as the initial step for AI innovation and development. Lastly, students must acquire age-relevant technical skills to enhance the quality of data sets, reconfigure algorithms, and improve AI system architectures based on test results and feedback.

Educational Framework for Preparing VET Graduates for Armed Conflict Scenarios

Core AI technologies relevant for preparing VET graduates for armed conflict scenarios include autonomous weapon systems, cybersecurity operations, and decision support systems. Thus, the first curricular goal would concern familiarizing trainees with autonomous weapon systems, which have been controversial, especially considering their applications for military reasons. An underlying issue is that such systems could trigger strikes against people or vehicles. The training for VET graduates should focus on informing them about new international rules governing the use of these systems, especially those under AI control. The second curricular goal concerns training graduates on the applications of AI in cybersecurity and information warfare. Granted, AI has revolutionized how militaries can launch or defend themselves against cyberattacks. By training graduates on AI and machine learning capabilities, they will be better placed to identify and remedy vulnerabilities in their systems. An example is the use of neural networks to recognize patterns from military data, address challenging issues, and protect systems against enemy attacks. The third curricular goal will focus on using AI in military decision support. VET graduates will need to understand the role AI can play in collecting, analyzing, and combining data sources to improve the efficiency of combat operations. Overall, these three AI applications are at the core of the proposed educational framework for VET graduates bound for the defense industry.

The policy framework for integrating AI into VET, specifically addressing military-driven requirements, is outlined in ***Table 2***.

Table 2. Proposed Educational Framework for VET: Policies

ISSUES	VET POLICIES
KEY CHALLENGES IN ADAPTING VET CURRICULA TO INCLUDE AI TECHNOLOGIES	- Aligning educational frameworks with rapidly evolving AI technologies. - Defining key competencies related to AI ethics, applications, and system design. - Integrating hands-on technical training with real-world AI tools and military simulations. - Continuous upskilling and reskilling of military personnel to keep pace with advancements in AI.
AI INFLUENCE THE NATURE OF WARFARE AND DEFENSE STRATEGIES	- Enhances decision-making processes through real-time data analysis and insights. - Leads to faster and more informed military decisions. - Revolutionizes operations with technologies like autonomous systems and cybersecurity. - Necessitates training in ethical implications and operational capabilities of AI in military contexts.

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SPECIFIC SKILLS THAT VET PROGRAMS FOCUS ON TO PREPARE STUDENTS FOR CAREERS IN AI-DRIVEN DEFENSE TECHNOLOGIES	- **Human-centeredness**: Understanding human agency and accountability in AI applications. - **AI ethics**: Knowledge of ethical principles related to AI use. - **AI applications and techniques**: Proficiency in programming and data analysis. - **AI system design**: Skills in problem identification and architectural design.

Several curricular goals will guide the implementation of AI ethics in the proposed educational framework. The first concerns demonstrating dilemmas related to AI use and identifying the main rationales underpinning ethical conflicts. Trainers will guide students in designing and developing AI. The second goal concerns offering learners opportunities to discuss age-appropriate real-world military case scenarios around the six primary ethical principles of doing no harm, non-discrimination, proportionality, sustainability, transparency, and human determination (*UNESCO, 2024*). Finally, it would be critical to guide learners in appreciating the implications of these ethical principles on AI for issues such as human rights, human agency, data safety, social justice, equity and inclusion, and environmental sustainability. With such measures in place, learners will utilize AI systems in military scenarios ethically and legally.

Hands-on technical training with real-world AI tools and military simulations will also comprise an integral part of the proposed educational framework. The first curricular goal will emphasize exemplifying AI's scope and definition based on real-world examples of AI tools, such as facial recognition technologies and pattern analyses evinced by scientific data. Using these examples, the trainer will help learners understand the elements and components that characterize AI. The second goal will entail promoting open-minded thinking and an interdisciplinary foundation for AI. Ideally, this will help learners better understand AI methods and research interests, such as the difference between strong and weak AI systems and the applications of artificial neural networks (*UNESCO, 2024*). Facilitating learners to acquire and practice the operational and engineering thinking skills necessary to assess various AI architectures as solutions to identified problems would also be critical. Still, virtual reality technologies will allow trainers to familiarize learners with AI applications in simulated combat environments. Without such hands-on technical training, trainees may lack the relevant skills and insights to use AI ethically, legally, and justly.

Collaboration with Defense and Industry

Strategic partnerships between VET institutions, the military, and AI-focused companies will be vital in enhancing the application and effectiveness of AI in combat operations. Ideally, such collaborations are necessary to facilitate stakeholders in anticipating and mitigating challenges relating to AI interoperability, safety, and strategic instability (*Trabucco & Maas, 2023*). Moreover, they offer plausible grounds for sustaining a technological edge in today's highly competitive global military environment (*Trabucco & Maas, 2023*). For instance, partnerships between military institutions and AI companies would create novel tools and frameworks for promoting consolidated interoperability, cooperative development, and data sharing. Alternatively, arrangements between VET institutions and the defense industry will ensure that VET graduates are familiar with current practices and technologies developed from the former partnership.

One strategy to keep the curriculum dynamic and responsive to new AI advancements will focus on promoting AI instructors' professional growth and development in these VET institutions. The Framework for Integrating Artificial Intelligence into VET for Defense is shown in ***Figure 1***. Trainers must continuously advance and update their knowledge, skills, and competencies related to AI to achieve the proposed educational framework goals. Another strategy concerns forming partnerships with resourceful AI companies and non-governmental organizations with a keen interest in consolidating their dominance and presence in the instruction of AI based on their brands (*Trabucco & Maas, 2023*). Such an initiative would not only upskill trainers and tutors in VET institutions but also define rigorous criteria for validating AI instruction. Without these strategies, it would be impossible for VET graduates to develop the skills and insights to respond appropriately to new advancements and developments in AI.

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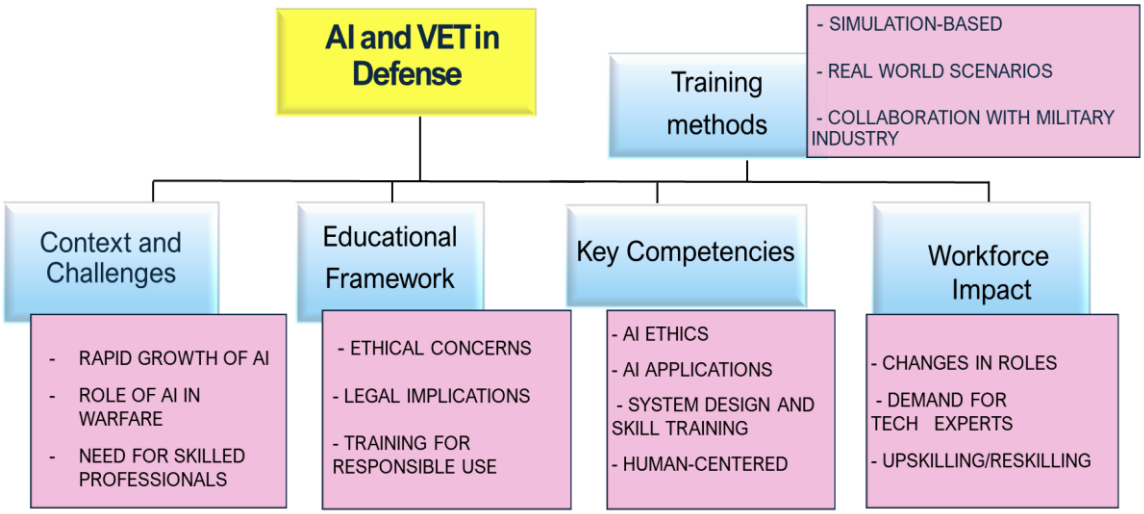

Figure1. Framework for Integrating AI into VET for Defense.
Author's source

Evaluation Model

The evaluation model for ascertaining the effectiveness of the proposed AI-integrated curriculum will depend on the identified competency aspects and trainees' capacity to understand, apply, and create using AI technologies. The "understand" portion of this framework focuses on learners' comprehension of the theoretical concepts and ethical principles (*UNESCO, 2024*). Alternatively, "apply" emphasizes students' mastery of problem-based practical AI skills and flexibility in handling task variation, whereas "create" concerns knowledge of designing, testing, and optimizing AI models. Overall, this evaluation model focuses on student competency levels and the ability to apply knowledge gained in the competency domains to develop effective AI systems and models for deployment in military operations (summarized on ***Table 3.***).

The Evaluation model consists of:

- *Competency Domains:*
  - Human-centeredness: Understanding human agency and accountability in AI applications.
  - AI Ethics: Mastery of ethical principles related to AI deployment.
  - AI Applications and Techniques: Knowledge and operational skills related to AI tools and techniques.
  - AI Systems Design: Skills in problem identification, architectural design, and iterative improvement of AI systems.
- *Mastery Levels:*
  - Understand: Assessing learners' comprehension of theoretical concepts and ethical principles.
  - Apply: Evaluating students' ability to use AI methods to solve practical problems.
  - Create: Testing learners' capacity to design, test, and optimize AI models and systems.
- *Assessment Methods:*
  - Assignments and Papers: Integral assignments to assess understanding and application of concepts.
  - Competency-based Examinations: Tests to gauge problem-based knowledge and practical skills.
  - Simulated Exams: Evaluations on problem identification and architectural configuration for AI systems.
- *Feedback Mechanisms:*
  - Collecting feedback from end-users regarding system performance and effectiveness.
  - Iterative assessments to refine and improve the curriculum based on learner outcomes.

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Table 3. Proposed Evaluation Model: summary

COMPETENCY DOMAINS	MASTERY LEVELS		
	UNDERSTAND	APPLY	CREATE
HUMAN-CENTEREDNESS	Provide learners with an integral assignment paper assessing the main concepts of human agency in ai applications.	Assess students' capacity to apply ai methods to solving life or learning problems	Assess students on the main aspects of social responsibility associated with creating ai systems.
AI ETHICS	Provide learners with an integral assignment to test their understanding of ethical principles associated with the use of ai.	Assess learners' knowledge of what constitutes safe and responsible use of ai applications.	Provide learners with an integral assignment paper testing their ability to co-create ethical rules for effective ai application.
AI APPLICATIONS AND TECHNIQUES	Provide learners with a competency-based examination test to gauge their problem-based ai knowledge and comprehension.	Test learners' practical skills using a computer-based test on the fluency, transferability, and flexibility of their operational skills on ai programming, algorithms, and data.	Provide learners with a computer-based group or individual test to determine how based they can customize ai toolkits to develop task-based ai tools.
AI SYSTEMS DESIGN	Provide students with simulated exams on problem-identification for ai system design to determine whether they can resolve specific real-world ai scenarios appropriately.	Tests on architectural ai configuration are also key to measure their understanding of applying project-based ai system configuration.	Learners should be able to explain the metrics for measuring a system's performance and collecting feedback from end users concerning environmental impact and social implications.

Ethical and Social Implications

Ethical education must be incorporated into the VET curriculum to prepare students for the moral challenges of using AI in war. Ethical dilemmas attendant with AI technologies (in particular autonomous weapons) needs careful consideration (*Akgun & Greenhow, 2022*). Students need to know how international regulations like the Geneva Convention define how a war is waged do not necessarily apply to autonomous systems. Training future professionals also requires VET institutions to pay attention to the broader social implications of AI in the military context (*Ahmad et al., 2021).* Students should be able to think critically about how AI technologies could impact society, and the risks involved in using AI in warfare.

RECOMMENDATIONS FOR FUTURE DIRECTIONS

With the rapid development of AI, VET programs must be dedicated so that their curricula can be updated continuously. With new AI technologies and the changing nature of military applications, VET institutions will be expected to train students with the latest tools and techniques (*Rott et al., 2022*). Partnering with defense companies, government agencies, and AI researchers could give students access to real-world applications and cutting-edge technologies. Curricula will be regularly updated so students know the most current ethical and legal frameworks for using AI in warfare. In light of new AI technologies, international regulations are evolving, and to keep up with them, VET programs need to ensure that students know the latest legal rules and ethical standards.

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VET programs should invest in developing simulation-based training environments that better prepare students for the practical applications of AI in defense. These will be simulations of real-world military scenarios in which AI technologies are used to make decisions, gather intelligence, and wage combat. Such simulations allow students to understand firsthand the functionality of AI-driven systems in dynamic and high-pressure conditions without real-world consequences. The simulated environments give students a deeper understanding of how AI instruments work and how to respond to various situations when malfunctioning or raising ethical dilemmas. Beyond that, simulation could become the backbone of cooperation processes between humans and AI, ensuring that students can manage and guide AI systems when complex military tasks are performed.

This **integration of AI into VET** can be implemented effectively if supported by an established policy framework:

- ***Need for Curriculum Reform****:* There is a critical need to adapt VET curricula to incorporate AI competencies, ensuring that future military professionals are equipped with the necessary skills to navigate the complexities of AI in warfare.
- ***Integration of Ethical Considerations***: The integration of AI technologies in military contexts raises significant ethical and legal challenges. VET programs must emphasize the importance of ethical training, particularly concerning the use of autonomous systems and compliance with international humanitarian laws.
- ***Focus on Specialized Competencies***: Future VET professionals should develop specialized competencies in areas such as AI ethics, system design, and human-centered practices. This focus will prepare them to manage AI technologies effectively and responsibly.
- ***Continuous Upskilling and Reskilling***: The rapid advancement of AI necessitates ongoing upskilling and reskilling of military personnel. VET programs must provide continuous education to ensure that the workforce remains adept at handling emerging technologies.
- ***Collaboration with Industry and Research***: Partnerships with defense companies, government agencies, and AI researchers are essential for VET institutions. Such collaborations can provide students with access to real-world applications and cutting-edge technologies, enhancing their practical training.
- ***Simulation-Based Training****:* The development of simulation-based training environments is crucial for preparing students for the practical applications of AI in defense. These simulations can help students understand the functionality of AI systems in high-pressure scenarios without real-world consequences.
- ***Balancing Operational Efficiency and Ethical Standards***: While AI offers significant advantages in operational efficiency, it is imperative that its deployment in military contexts is balanced with adherence to ethical standards and humanitarian norms.

7. CONCLUSION

Summary of Key Points

By incorporating AI skills into VET curricula, stakeholders prepare future professionals to handle the complexities of AI in warfare, including its technical, ethical, and legal aspects. AI is changing warfare unprecedentedly, and the challenges and opportunities for defense professionals are growing rapidly. VET programs prepare students for the technical, ethical, and legal complexities of working with military technologies driven by AI. Via this, VET institutions can incorporate AI education into their curricula so that future professionals can deal with this rapidly changing environment.

As AI advances, the role of VET in developing a ready and qualified workforce to fill AI-driven jobs will become increasingly important. VET programs emphasize technical skills and ethical considerations, guaranteeing that graduates are ready to work with and use these technologies in ways acceptable by international humanitarian and ethical standards. AI has a transformative potential in warfare, but it should be used solely by human professionals responsible for ensuring its appropriate and responsible application.

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