

<p>TITLE</p>	<p>Adaptive Learning Interventions based on Artificial Intelligence (AI) to Support Personalized and Flexible Education</p>
<p>PROBLEM STATEMENT</p>	<p>There are many flexible learning resources available that students can follow at any time, place and method. However, students are now faced with the challenge of selecting knowledge content that matches their needs. Learning success still depends on the student's self-motivation and there is a possibility that students do not complete the learning process as it should. AI can help monitor and guide the development of self-learning in an adaptive and personalized way. However, AI tools that can support smart learning interventions that can provide specific recommendations based on student problems are still limited. Educators and academic administrators also need the support of tools that can report the situation, needs and proposed interventions to students.</p> <p>Digital records of learning have been widely available in various agencies but their use for supporting teaching and learning management is constrained due to the lack of solutions with high-level AI methods that can be used including for:</p> <ul style="list-style-type: none"> - enrichment and augmentation of information for the strengthening of personalized and adaptive guidance in the implementation of flexible lessons, - recommendations (recommend) intervention actions (such as recommendation of materials, activities and evaluation based on the type of student problem, student preference, potential direction, and students' level of thinking). <p>Additionally, there is a need for AI tools that can automate appropriate academic routine tasks (such as reminding students to submit assignments) to increase educator productivity.</p> <p>Acceptance of AI solutions that can transform education delivery methods needs to be supported by a good governance process but currently no clear guidelines have been established. The design of the AI solution produced also needs to be evaluated and monitored so that it is compatible with the target user and has no negative implications for software development. It is also to ensure that the solutions used match the</p>

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	<p>needs of users and are used responsibly.</p> <p>The level of AI literacy among students, educators and academic administrators needs to be improved but there is no AI literacy competency improvement program and AI tools specifically for educational stakeholders are provided. AI knowledge specific to education is very important to solve because the field of education requires solutions with a combination of knowledge development, pedagogy and service management.</p>
SPECIFICATIONS	<p>The pilot implementation involves several education departments, schools and institutions in the national education sector through:</p> <ol style="list-style-type: none"> i. Development of products based on AI, machine learning and data science to support the development of personalized students and the implementation of flexible education in line with the content of the national level curriculum (example features: a dashboard that reports students in need of guidance, material recommendations and assessment adaptively based on student preferences and potential direction, the material taught to AI must be in line with the content of the national level curriculum). ii. Development of modules and implementation of data literacy and AI competency improvement programs for stakeholders in the education sector (for example: training practical to educate users to analyze the content suggested by AI, as well as the need for users to understand how to use AI as a teaching and learning companion). iii. Standard operating procedures, guidelines, or best practices developed for the governance of AI system must also consider the implications to the educational system and learning sciences at the institution. It includes managing the ability of the educator and administrator to deeply understand student achievement and needs from time to time, as well as ensuring data security and risk assessment. <p>Applicants must comply with all the above specifications.</p>
JUSTIFICATION	<p>Flexible delivery of education (such as micro-credentials, flexible learning, and MOOCs) requires new methods for educators, academic administrators, and students to have a good learning experience.</p> <p>AI technology through the implementation of the proposed project can streamline the quality of education delivery and student learning experience, improve the productivity of educators and</p>

academic administrators, as well as transform education management methods driven by data and insights through a system that can report the results of monitoring student activities and achievements, automating some routine activities (such as reminder messages to students to complete learning activities, and lists of things that need the attention of educators), and predicting student achievement for the purpose of intervention guidance for each individual student.

The economic competitiveness of the education industry will increase because AI functionality through projects will be able to augment the expertise of educators and academic administrators, and more accurate results can be produced by combining expert knowledge with predictive results.

The proposed project is aligned with the targets in the National AI Roadmap 2021-2025:

- *Strategic Initiative 2.1 Embarking on fundamental and applied R&D in the relevant entities within the AI Innovation Ecosystem; Horizon 2: Embark on R&D for developing next-generation AI technologies to be applied in fields that are of strategic importance to Malaysia*
- *Strategic Initiative 2.2 Encouraging AI adoption in R&D for all areas (S&T and non-S&T); Horizon 2 (2023-2024): Establish special R&D grants for non-S&T projects that incorporate AI.*
- *Strategic Initiative 2.3 Institutionalizing AI within all National Research Institutes; Horizon 2 (2023-2024): Intensive AI R&D in domain areas.*
- *Strategic Initiative 4.1 Offering Comprehensive and Inclusive AI Education; Horizon 2 (2023-2024): AI Education for Educators (AI-EE).*

The Talent Working Committee under the National Blockchain and Artificial Intelligence Committee (NBAIC) has identified various methods of AI competency development, which also includes students, educators and academic administrators.

Proposed project also support the achievement of targets in several key policies at the national level related to the digitization of education and the application of AI in education, namely:

Twelfth Malaysia Plan:

Policy Enabler 1: Developing Future Ready Talent

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	<p style="text-align: center;">Policy Enabler 2: Promoting Digitization and Advanced Technologies</p> <p><i>Blueprint</i> MYDIGITAL ECONOMY: Core 2: Increasing economic competitiveness through digitization Core 3: Build digital infrastructure that enables citizens to participate in the digital economy Core 4: Build agile and efficient digital talent Core 5: Create an inclusive digital society</p> <p>NATIONAL 4IR POLICY: Core 1: Equipping citizens with 4IR knowledge and skill sets Core 2: Forging a connected nation through the development of digital infrastructure Core 3: Future-proof regulations to be agile with technological change Core 4: Accelerating innovation and adoption of 4IR technologies</p> <p>The Digital Education Policy covers six cores:</p> <ol style="list-style-type: none"> 1. Digitally literate students 2. Digitally competent educators 3. Visionary digital leadership culture, 4. Infrastructure and infostructure empowerment 5. Quality digital content 6. A committed strategic partner
<p>EXPECTED RESULTS OF THE PROJECT</p>	<p>Expected Output:</p> <ol style="list-style-type: none"> 1) AI systems that are assistive, augmentation, autonomous to support the implementation of personalized and adaptive learning. 2) All AI components need to go through a risk assessment and have a human-in-the-loop AI protocol that also complies with the principles of responsible AI use, in the Development phase, before implementation and during deployment. 3) Users need to be equally involved in all phases of the production of the AI product as well as monitoring and auditing the use of the system. 4) The data security must prioritized the institution infostructure. The solution should consider the concept of open as possible and close as necessary through national platform such as Malaysia Open Science Platform and data.gov.my 5) Mechanisms for monitoring the use of AI systems including through impact studies need to be managed together with stakeholders and strategic partners.

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	<p>6) Implications for learning science, education services and other metrics determined by the stakeholders must be addressed (such as the appropriateness of automated grading by AI that may result in students not receiving the necessary guidance from educators, as well as educators not being able to deeply understand student achievement and needs from time to time).</p> <p>7) Applications involving competency development must be reported and take into account the AI talent development strategy at the national level.</p> <p>Applicants must deliver all the above expected outputs.</p> <p>Long-term impact:</p> <ol style="list-style-type: none"> 1) The use of AI tools to support the implementation of flexible and personalized learning 2) Improvements in the guidance approach of student development and the automation of educator tasks 3) Educators and academic administrators who are data and AI literate 4) Implementation of a responsible AI-based education system
MAXIMUM FUNDING (RM)	15 million
STAKEHOLDERS	<ol style="list-style-type: none"> 1. Malaysia Education Ministry 2. Ministry of Higher Education 3. Institutions of Higher Education 4. Higher Education Leadership Academy (AKEPT) 5. DIAMOND 6. Aminuddin Baki Institute 7. Malaysia Development Economy Corporation (MDEC) 8. TalentCorp

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APPLICATION	Application Channel	Applications for the Strategic Research Fund – RFP (SRF-RFP) can be made through the MOSTI Integrated Fund System at the link SDB: SRF-RFP
	Period Application	7 March 2024 – 22 April 2024
	Application Guidelines	Details of application requirements are as follows contained in the SRF-RFP Guidelines at the link GP SRF-RFP