CaknaMinda: An Educator-Centred Mobile App for Early Screening of Mental Health and Schizophrenia Risks

[*1]Ahmad Mustafa Surdi Roslan, [2]Nursafra Mohd Zhaffar, [3]Aiman Mudzafar Mohamad Khairi, [4]Siti Nur Husna Abd Rahman, [5]Nur Illyana Natasha Mohamad Yusri

[1 2 3 4 5] Universiti Teknologi MARA (UiTM), Cawangan Negeri Sembilan, Kampus Rembau

***Corresponding Author**

DOI: https://dx.doi.org/10.47772/IJRISS.2025.925ILEIID000059

Received: 23 September 2025; Accepted: 30 September 2025; Published: 06 November 2025

ABSTRACT

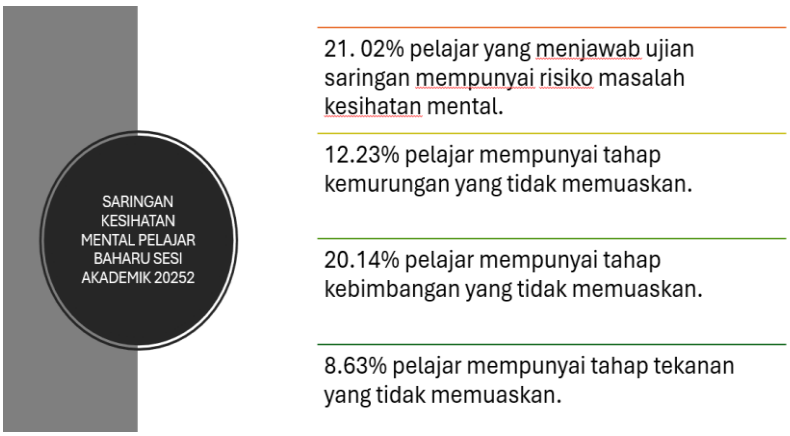
This project introduces CaknaMinda, an educator-centred mobile application designed to assist educators in the early-stage screening of students at risk of mental health issues, including depression, anxiety, stress, and schizophrenia. The app addresses the gap in mental health literacy and early detection capability within educational settings by providing two key functions: (1) enhancing educators' understanding of mental health through guided literacy modules, and (2) offering a structured digital platform for preliminary mental health assessments including risks relating to schizophrenia. The system integrates a user-friendly interface and automated screening algorithm, digitalizing assessments such as the Depression Anxiety Stress Scale (DASS) and a schizophrenia risk questionnaire. Educators can share these digital assessments with students, and the app automatically processes responses to generate clear reports identifying potential risk levels and provide guided actions for seeking treatment. Evaluation with 84 respondents (educators and students) using a ten-item Likert-scale questionnaire produced very high mean scores for both mental health literacy (M = 4.30, SD = 0.74) and application usability (M = 4.27, SD = 0.69), reflecting strong acceptance and perceived usefulness for the app. By integrating educator-led assessment with a digitalized approach, CaknaMinda offers a relevant solution to early mental health intervention across educational settings in Malaysia.

Keywords: mental health screening, early intervention, DASS, schizophrenia, classroom innovation.

INTRODUCTION

Mental health concerns among Malaysian students are escalating at an alarming rate, cutting across primary, secondary, and tertiary education settings. The National Health and Morbidity Survey (NHMS) 2019 reported that 7.9% of children aged 5 to 15 years experienced mental health problems, representing approximately 424,000 individuals (Institute for Public Health [IPH], Ministry of Health Malaysia, 2019). More recent findings from NHMS 2023 indicate that the prevalence has more than doubled to 16.5%, affecting over 922,000 children in the same age group (IPH, 2023). Among adolescents, the Adolescent Health Survey (AHS) 2022 revealed that 26.9% reported symptoms of depression, 40.8% experienced anxiety, and 10.8% had suicidal ideation (IPH, 2022). The increase in mental health cases also involves institutions such as UiTM. A report from the Internal Management Meeting (MPD) at UiTM revealed that out of 139 new students who took the Mental Health Screening Test (SkeM-P), a total of 20% were found to be at risk of experiencing mental health problems (Figure 1).

Figure 1: Mental health screening data of new students at UiTM Negeri Sembilan.



(**Source:** Mesyuarat Pengurusan Dalaman Kampus Rembau, 18 April 2025)

In the educational setting, educators play a vital role as they are the individuals students interact with on a daily basis, making them uniquely positioned to observe subtle changes in academic performance and also behaviour. Educational institution should not be the prevailing cause for mental health risks instead should nurture mental health growth. Unfortunately, today's statistics indicates that mental health risks are on the rise among adolescences. Educators, in particular, are at the frontlines of this issue, as their responsibilities extend beyond conduct classes but also promoting students' academic progress and personal development. Despite the growing prevalence of these issues, current awareness and intervention strategies in educational settings remain limited, creating an urgent need to examine the gaps in existing approaches.

Problem Statement

Mental health issues among students in Malaysia are increasingly recognized as a significant concern with recent surveys indicating sharp rises in cases of depression, anxiety, stress, and even more severe conditions such as schizophrenia. All the more concerning is the case on July 2025 involving a UiTM Negeri Sembilan student who jumped from the 4th floor of a campus building after reporting hearing voices urging him to do so (Figure 2). In many cases, awareness about the seriousness of mental health is raised only in response to incidents rather than as a preventative measure.

Figure 2 A Kosmo newspaper report concerning the incident involving a UiTM student who leapt from a building (6 July 2025).

NEGARA

Pelajar universiti jatuh tingkat 4, dakwa dengar bisikan

Oleh NOR AINNA HAMZAH 6 Julai 2025, 6:33 pm

KUALA PILAH – Seorang pelajar lelaki sebuah institusi pengajian tinggi di sini cedera selepas terjatuh dari tingkat empat bangunan asrama awal pagi tadi.

Ketua Polis Daerah Kuala Pilah, Superitenden Muhamad Mustafah Hussin berkata, pihaknya menerima panggilan berhubung kejadian itu dari Hospital Tuanku Ampuan Najihah (HTAN) pada pukul 1.40 pagi.

Katanya, mangsa berusia awal 20-an menerima rawatan di Zon Merah HTAN dan laporan x-tray menunjukkan pelajar tersebut mengalami kecederaan patah tulang pinggul.

"Bagaimanapun, tiada kecederaan serius. Mangsa stabil dan masih menerima rawatan. Berdasarkan maklumat awal yang diperoleh daripada saksi, mangsa naik ke tingkat empat tanpa pengetahuan sesiapa.

To address the issue of awareness about mental health, several mobile applications have been developed namely; Mental SEHAT under the SELangkah app and MyMinda under MySejahtera app (Selangor State Government, 2021; MOH, 2023). MyMinda offers basic self-assessments and referral access, whereas Mental SEHAT provides a broader range of assessments including DASS-21, Patient Health Questionnaire-9 (PHQ), Perceived Stress Scale-10 (PSS) and Geriatric Depression Scale-15 (GDS) alongside literacy modules and subsidized psychiatric services. However, these apps do not include a schizophrenia screening apparatus or assessment. Although schizophrenia is less likely to occur compared to depression and anxiety, its absence leaves a critical gap in early detection because it can have a profound and dire consequence if not identified and dealt at an early stage.

While both initiatives provide valuable tools for the general public, they are primarily designed for individual use and public awareness rather than in an educational setting. In a students' environment, this often does not translate into sustained treatment-seeking behaviour or adequate intervention. This gap underscores the need for the involvement of a third party, namely educators, who are strategically positioned to observe, screen, and guide students towards appropriate referral pathways. By equipping educators with reliable screening tools, not only can at-risk students be directed towards professional support, but classroom environments can also be better adapted to accommodate and respond to the mental health challenges faced by students.

Moreover, in the Institution of Higher Learning (IPT), counselling services face their own limitations. In UiTM Negeri Sembilan alone, each of the Kuala Pilah and Rembau campuses has approximately 3,000 students served by only one counsellor (a ratio of 1:3000), while the Seremban campus has two counsellors for the same number of students (1:1500) (Universiti Teknologi MARA Negeri Sembilan, n.d.). This counsellor-to-student ratio is far too small to provide timely and individualized attention to at-risk students. CaknaMinda is a solution to bridge this gap, equipping educators with evidence-based digital tools to support preliminary proactive mental health care within educational institutions.

Objectives

1. Provide literacy for educators about mental health risks prevalent among students in Malaysia.
2. Provide facility for educators to conduct early-stage screening of students who may be experiencing mental health risks.

PRODUCT DESCRIPTION & METHODOLOGY

Figure 3 Logo for the CaknaMinda Ap

Core Features: CaknaMinda is a mobile and web-based application designed primarily for educators to conduct early-stage mental health screening among students. By combining mental health literacy with digitalised questionnaires and referral pathways, it enables timely detection of risks and guides students toward appropriate support. Its ultimate aim is to safeguard students' wellbeing while reducing the burden on counsellors in educational institutions. In addition to its mobile format, CaknaMinda can also be accessed through its website: https://aimanmudzafar.com/caknaminda/.

The app integrates evidence-based psychiatric assessment instruments into a digital format. Specifically, it incorporates the Depression Anxiety Stress Scale–21 (DASS-21), adapted from the version published by the Unit Pengurusan Psikologi, BDSP MOF, alongside a schizophrenia screening questionnaire, both presented through a user-friendly interface accessible via mobile devices. An embedded algorithm processes responses automatically, enabling efficient identification of risk indicators without requiring specialist input at the initial stage (Lovibond & Lovibond, 1995; Unit Pengurusan Psikologi, BDSP MOF, n.d.).

To ensure functionality and ease of use, CaknaMinda is structured into five main menus. The "Jenis Gangguan Mental" menu provides simplified clinical definitions for depression, anxiety, bipolar disorder, and schizophrenia, while the "Simptom" menu lists the characteristic symptoms of these conditions to aid recognition. The "Penilaian & Soal Selidik Saringan Awal" menu enables educators to share early-stage screening tools, offering two options: the DASS questionnaire and the schizophrenia screening questionnaire. The "Bantuan" menu consolidates resources such as mental health helplines, psychiatric associations that provide information on clinical help, as well as Islamic therapy resources, including prayers and Quran recitations (Figure 4).

Figure 4 Five Main Menus of CaknaMinda viewed from its web-page.

The application is primarily intended for use by educators in schools and higher education institutions. However, students interact with the tool directly by undertaking the digitalized screening questionnaires forwarded by their educators. This dual approach allows educators to remain actively involved in the early detection process while empowering students to self-report their mental health status in a private and accessible manner.

System Workflow: CaknaMinda operates through a structured workflow (Figure 5).

Figure 5 Flowchart of the System Workflow for CaknaMinda App

Firstly, CaknaMinda provides a simplified clinical definition for depression, anxiety, bipolar and schizophrenia. Upon learning the clinical definitions, educators are better equipped to recognize potential warning signs among students and to identify those who may be at risk of developing mental health issues. Once this awareness is established, educators can invite students to undertake digitalized screening tools provided within the app; which is shared through an online link. Students exhibiting disturbances of depression and anxiety would be answering the DASS questionnaire whereas students manifesting disturbance of schizophrenia would be answering the schizophrenia questionnaire.

Once students undertake the digitalized DASS questionnaire, their responses are automatically scored by the system according to standardized DASS procedures. The results are then compared against established thresholds, allowing both educators and students to identify the level of risk. Likewise, the schizophrenia questionnaire follows the same process. The questionnaire items are mapped according to DSM-5 diagnostic categories (American Psychiatric Publishing, 2013) and the PANSS assessment scale (Kay & Opler, 1987), where disturbances in thought and perception fall under Category A, while disturbances in behaviour fall under Category B.

The results of the schizophrenia screening are categorized into a four-tier risk flagging system designed to guide educators in determining appropriate next steps, also known traffic-light risk system (Figure 6-7). Students showing disturbances in both thought/perception (Category A) and behaviour (Category B) are flagged red, indicating the need for immediate referral to psychiatric services. Students with disturbances only in Category A are flagged orange, warranting referral to a counsellor. Those with disturbances only in Category B are flagged yellow, where observation and monitoring by those around the student are recommended. Students not exhibiting either category are flagged green, indicating no significant risk (Table 1).

Figure 6 Traffic-Light Risk System for the results of the schizophrenia screening (Red and Orange)

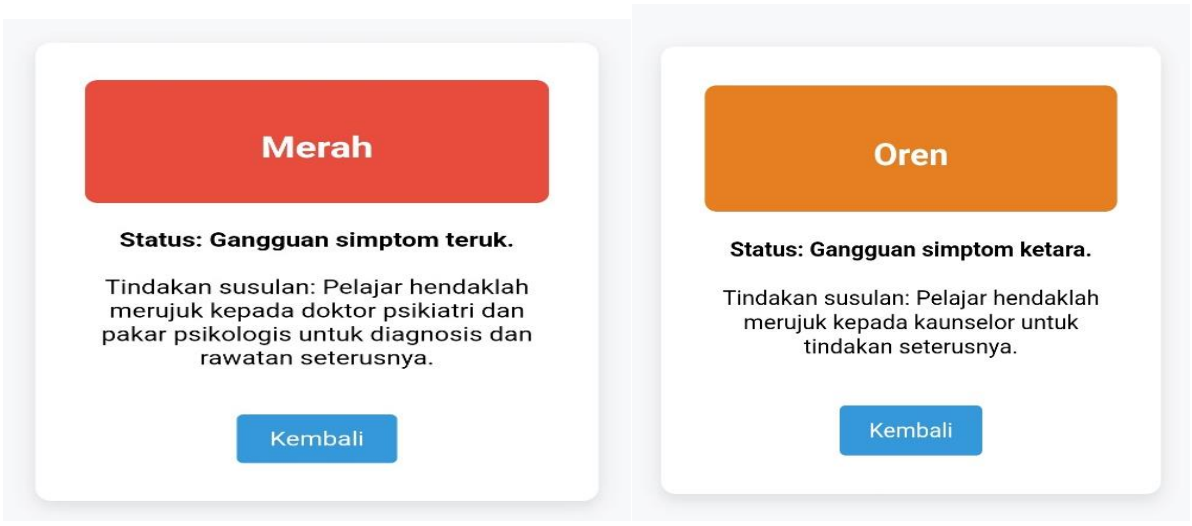
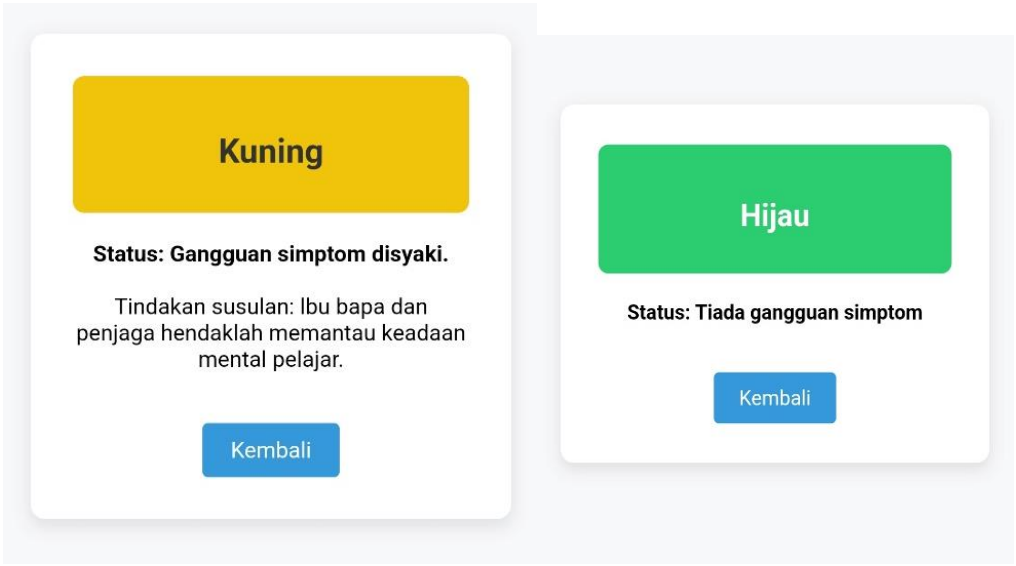


Figure 7 Traffic-Light Risk System for the results of the schizophrenia screening (Yellow and Green)



By adhering to these validated clinical frameworks, the app provides clear, evidence-based indications of students who may be at risk of mental health disorders and require further attention or referral for professional support. Unlike existing apps that primarily provide raw assessment scores, CaknaMinda goes a step further by translating results into actionable, step-based guidance for educators. Its traffic-light risk stratification system is a unique contribution that enables non-clinicians to clearly understand the level of risk and determine the most appropriate next steps, whether that involves observation, counselling, or immediate psychiatric referral.

Table 1 Traffic Light Risk System in CaknaMinda

Colour	Category	Definition	Guided Action
Red	Category A + B	Disturbances in thought, perception, and behaviour.	Urgent referral to psychiatrist or doctor required.
Orange	Category A	Disturbances in thought and perception, but not behaviour.	Refer to counsellor for further assessment.
Yellow	Category B	Disturbances mainly in behaviour	Monitor closely – people around the student should observe.
Green	No Risk	Student shows no significant symptoms of mental health disorders.	Normal – continue routine observation.

Potential Findings and Commercialisation

To evaluate educators' and students' perceptions toward the CaknaMinda application and their literacy regarding mental health awareness, a quantitative analysis was conducted using ten statements rated on a five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). These items were grouped into two domains: (1) Level of Literacy of Mental Health and (2) Level of Usability of CaknaMinda Application, with each representing a distinct construct. Following the analytical framework proposed by Boone and Boone (2012), individual items were combined within each domain to form Likert scales and analyzed using mean and standard deviation.

84 respondents took part in the evaluation. The qualitative interpretation of mean scores was based on a five-level classification: 1.00–1.80 (Very Low), 1.81–2.60 (Low), 2.61–3.40 (Moderate), 3.41–4.20 (High), and

4.21–5.00 (Very High). This interpretation scheme from the study of Nyutu, Cobern and Pleasants (2021) was adopted to provide clearer insights into respondents' levels of agreement.

In the effort to validate CaknaMinda and ensure its practicality in real-world settings, expert opinions and user testimonies were gathered. These included insights from a licensed psychologist as well as lecturers from UiTM and non-UiTM institutions (Table 2). Their feedback provides supporting evidence for the app's anticipated outcomes, particularly in improving mental health literacy among educators and facilitating early-stage screening processes. By grounding the findings in both clinical expertise and educator experience, the app's potential impact can be assessed with greater credibility and relevance to the academic environment.

Table 2 List of psychologist and lecturers providing testimonies on CaknaMinda

UiTM		**Non-UiTM**	
Dr. Mohd Hidayat Bin Mahadi	ACIS, UiTM Shah Alam	Dr. Muhammad Adnan bin Pitchan	UKM
Khairah binti Ismail	ACIS, UiTM Dengkil	Nurul Sakinah binti Aziz	MMU
Dr. Wan Nor Aisyah	ACIS, UiTM Negeri Sembilan	Assoc. Prof Dr. Khairul Hamimah Mohammad Jodi	OUM
Suhaila Sharil	ACIS, UiTM Negeri Sembilan		
Nasrullah Zainal Abidin	Senior Psychologist, UiTM Negeri Sembilan		

Quantitative Findings

Table 3 presents the descriptive statistics for each domain. The mean scores for all ten items ranged between 4.05 and 4.61, while the domain averages were 4.30 (SD = 0.74) for Level of Literacy of Mental Health and 4.27 (SD = 0.69) for Usability of the Application. The overall mean score of 4.28 (SD = 0.71) indicates generally positive responses among participants.

Table 3 Results from CaknaMinda Evaluation

Domain 1: Level of Literacy of Mental Health				
Item	Statement	Mean	SD	Level
1	I understand the difference between normal stress and mental health problems.	4.24	0.62	Very High
2	I know where to obtain reliable information about mental health.	4.05	0.80	High
3	I can identify early signs of mental health problems such as depression or anxiety.	4.09	0.77	High
4	I believe that mental health is just as important as physical health.	4.52	0.75	Very High
5	I know that seeking early treatment can help prevent mental health problems from becoming more serious.	4.62	0.51	Very High
Mean for Domain 1		4.30	0.74	Very High
Domain 2: Level of Usability of CaknaMinda Application				
Item	Statement	Mean	SD	Level
6	The CaknaMinda application is easy to use for conducting early mental health screening.	4.32	0.71	Very High
7	The instructions and interface of the application are clear and easy to understand.	4.30	0.69	High

8	I can complete the early screening quickly using this application.	4.19	0.77	High
9	This application helps me identify early signs of mental health problems.	4.31	0.60	Very High
10	I am confident that this application is stable and can be used without major technical issues.	4.24	0.68	Very High
Mean for Domain 2		4.27	0.69	Very High
Overall Mean		**4.28**	**0.71**	**Very High**

Level Indicator: Very Low (1.00 – 1.80), Low (1.81 – 2.60), Neutral (2.61 – 3.40), High (3.41 – 4.20) and Very High (4.21 – 5.00). N= 84. [Source: Nyutu, Cobern & Pleasants, 2021]

Both domains recorded mean scores above 4.00, categorized as High, indicating strong positive perceptions among respondents. For Domain 1 (Level of Literacy of Mental Health), educators demonstrated a solid understanding of mental health concepts, particularly regarding the importance of early identification and treatment. Meanwhile, Domain 2 (Use of the CaknaMinda Application) also recorded high mean values, suggesting that respondents found the app's interface, instructions, and overall usability effective for conducting early-stage screenings. The overall mean score of 4.28 (SD = 0.71) reflects a generally high level of acceptance toward both the literacy and usability aspects of the CaknaMinda application.

Improving Literacy among Educators

The quantitative analysis of Domain 1 (Knowledge and Awareness of Mental Health) recorded a mean score of 4.30 (SD = 0.74), indicating a high level of agreement among respondents. This finding suggests that educators demonstrated strong awareness of mental health concepts and recognized the importance of early identification and intervention. The high means observed in individual items, such as "Mental health is as important as physical health" (M = 4.52) and "Seeking early treatment can prevent more serious problems" (M = 4.61), reinforce the conclusion that respondents possess both positive attitudes and sound understanding of mental health issues.

These results are supported by qualitative insights obtained from expert testimonies. Several educators and psychologists emphasized that the literacy components embedded in CaknaMinda including the simplified clinical definitions and symptom explanations that help lecturers better distinguish between normal academic stress and signs of potential mental health disorders. Dr. Wan Nor Aisyah highlighted that CaknaMinda enables lecturers to recognize subtle behavioural changes that might otherwise be overlooked, thereby improving early detection efforts. Similarly, Dr. Muhammad Adnan Pitchan noted that the app promotes reflective awareness and empathy among educators, encouraging more compassionate engagement with students exhibiting mental health difficulties.

The improvement in mental health literacy also plays a crucial role in reducing stigma within educational environments. As educators develop a clearer understanding of psychological conditions, they are less likely to associate such challenges with weakness or misconduct. This shift in perception fosters a more open and supportive classroom culture where students can express their struggles without fear of judgment. Suhaila Sharil further observed that educators who use the app tend to adopt a more empathetic and measured response when dealing with students under stress, replacing punitive attitudes with understanding and guidance.

In sum, both the quantitative and qualitative findings converge to show that CaknaMinda effectively enhances educators' mental health literacy. The app's educational modules, simplified clinical information, and accessible design collectively empower educators to act as informed first responders. This not only enriches their understanding of mental health but also ensures that at-risk students receive timely attention and support.

Providing facility for early-stage screening of mental health risks

The second domain of analysis measured educators' perceptions of the CaknaMinda application as a facility for conducting early mental health screening. Results from Table 3 indicate that respondents reported a Very High level of usability (M = 4.27, SD = 0.69). High agreement was observed for items such as "The CaknaMinda application is easy to use for conducting early mental health screening" (M = 4.32) and "This application helps me identify early signs of mental health problems" (M = 4.31). These findings demonstrate that the system's interface, instructions, and screening workflow are clear, user-friendly, and functionally stable, enabling educators to perform early identification efficiently and confidently.

Expert testimonies provide qualitative explanations that reinforce these results. Suhaila Sharil, a lecturer at UiTM Negeri Sembilan, emphasized that prior to CaknaMinda, lecturers often relied solely on observation when suspecting a student's mental health issue. With the app, they now have a structured screening process that produces tangible, data-driven reports which can be shared with counsellors for follow-up. This testimony helps explain the high usability ratings: CaknaMinda effectively bridges the gap between intuition and evidence by giving educators a reliable mechanism for early detection.

In addition, Nasrullah Zainal Abidin, Senior Psychology Officer at UiTM Negeri Sembilan, highlighted the app's strength in simplifying complex psychiatric assessments into an intuitive, color-coded system. The traffic-light classification (green, yellow, orange, red) enables non-clinical users to understand students' mental health status at a glance and determine the appropriate response—whether observation, counselling, or immediate referral. This practical feature explains why respondents rated the app highly for its clarity and effectiveness, as it transforms professional-level screening concepts into accessible tools for educators.

These findings also align with broader institutional needs. At UiTM Negeri Sembilan, the ratio of counsellors to students is approximately 1:3000, making it difficult to provide individualized attention. With the availability of CaknaMinda, 107 lecturers can now collectively assist in early screening, effectively improving the support ratio to 1:28. This significant improvement demonstrates the app's functional role in easing the burden on counsellors while empowering educators to take a proactive part in students' mental wellbeing.

Overall, both the statistical results and expert insights affirm that CaknaMinda successfully provides a reliable, accessible, and scientifically grounded screening facility for educational settings. The app's integration of validated instruments such as the DASS-21 and schizophrenia screening tool, coupled with its guided referral pathways, ensures that mental health risks are identified early and acted upon appropriately. These findings underscore the app's potential to transform mental health management in education from reactive to preventive, ensuring that help reaches students before crises occur.

Commercialization

For CaknaMinda to move beyond the research stage and become impactful in real-world settings, a clear commercialisation strategy is required. This strategy revolves around three key pillars: availability, sustainability, and scalability.

Availability is achieved by ensuring that the app is not only accessible but also actively used by its intended users; educators and students within institutions. This can be accomplished first through institutional piloting and endorsement, beginning with UiTM campuses where the counsellor-to-student ratio is critically imbalanced. Formal adoption by UiTM management would legitimise its use and encourage uptake among lecturers. Availability is further reinforced by integrating the app into existing counselling workflows, so that it becomes part of the established support system rather than an optional tool.

To support widespread use, the app must also be easily accessible via mobile and web platforms, designed to be lightweight, secure, and user-friendly. In addition, training and onboarding sessions for lecturers are essential to build confidence in using the literacy modules, screening tools, and reporting features. Finally, long-term technical support and regular system updates will ensure that the app remains reliable, functional, and responsive to user needs. Together, these measures make CaknaMinda readily available, practical, and seamlessly integrated into the daily routines of both educators and students.

Sustainability requires that the app remains functional, reliable, and supported over the long term without creating barriers for students or educators. To achieve this, CaknaMinda can adopt an institution-funded model, where universities cover the costs of licensing, maintenance, and updates, while the app remains free to use at the point of access. This ensures that financial considerations never prevent students or lecturers from engaging with the app, while embedding the responsibility for sustainability within the institutional budget for student wellbeing and counselling services. By aligning financial responsibility with institutions while keeping the app free for direct users, CaknaMinda combines accessibility with long-term viability, ensuring that it remains both impactful and sustainable.

Scalability ensures that CaknaMinda can expand its reach beyond its initial pilot setting and be adopted at larger institutional and national levels. The most immediate step is to roll out the app across all UiTM campuses, leveraging its large student population and diverse academic settings as a testing ground for wider adoption. Successful implementation in UiTM can serve as a model of best practice, supported by data that demonstrates improvements in early detection and educator involvement.

Once validated, CaknaMinda can be extended to other Institutions of Higher Learning (IPT) across Malaysia, many of which face similar counsellor shortages and increasing student mental health challenges. To support this expansion, institutional partnerships and training frameworks should be standardised, ensuring consistent application of the app's literacy, screening, and referral functions.

In the longer term, the scalability of CaknaMinda lies in integration with national digital health and education platforms such as MySejahtera or SELangkah. This would enable its use not only in universities, but also in schools and other learning institutions, bridging the gap between health and education sectors. With government endorsement, the app could form part of a nationwide proactive mental health screening strategy, positioning Malaysia as a regional leader in integrating digital health solutions within education.

Novelty and Recommendations

The novelty of CaknaMinda lies in its introduction of an educator-centered screening approach to student mental health. By equipping educators with literacy on mental health risks and digital screening tools, the app directly addresses the bottleneck created by the limited number of counsellors available to serve thousands of students in each UiTM campus. Instead of relying solely on counsellors or self-screening applications, CaknaMinda empowers educators; who interact with students on a daily basis, to act as the first line of support. They are thus able to observe behavioural changes, facilitate early-stage screening, and guide students toward timely referral when necessary.

Another key novelty is that, unlike existing applications such as MyMinda and Mental SEHAT which are entirely individual-based, CaknaMinda is built on the premise that students often need external encouragement to seek help. Left on their own, many students may become aware of their mental health risks but fail to act on them. While most apps stop at providing raw self-assessment scores, CaknaMinda goes further by offering a traffic-light risk stratification system (green, yellow, orange, red). This design provides educators with clear, actionable guidance on the level of urgency, ensuring that awareness is translated into immediate action rather than remaining informational only. By integrating educators into the process, CaknaMinda provides this crucial "push," ensuring that awareness is translated into action. Furthermore, the results produced by the app's algorithm are not merely descriptive, but are designed to create a sense of urgency for both students and educators to respond, thereby increasing the likelihood of timely intervention and referral.

Building on this novelty, several recommendations can be suggested to enhance the development, implementation, and long-term impact of CaknaMinda within UiTM and beyond. Given the high student-to-counsellor ratio across UiTM campuses; 1:3000 in Kuala Pilah and Rembau, and 1:1500 in Seremban, it is strongly recommended that CaknaMinda be piloted and integrated as a complementary tool to existing counselling workflows. Future development should focus on tailoring the app to UiTM's needs and also other Institutions of Higher Learning (IPT), such as building direct referral pathways to campus counsellors and nearby psychiatric services, ensuring that flagged students receive timely support despite the limited manpower. Training programs for educators should also be developed to equip them with the skills needed to

interpret screening results and approach students with sensitivity and care, turning them into effective first responders in the mental health ecosystem.

In addition, the app could incorporate long-term monitoring features, enabling educators and counsellors to track students' mental health throughout their study period. This would provide better individualized attention, allowing recurring risks to be detected early and ensuring that interventions are not one-off, but continuous and responsive to students' evolving needs.

In addition to screening and referral, future development of CaknaMinda could incorporate modules that provide educators with adaptive learning strategies for students identified as at risk. Inducing high level of stress from workloads, assignments and exam would eventually exacerbate existing and even unnoticed mental health risks. This could further intensify anxiety and depression that can lead to burnout. Students facing constant pressure can directly undermine academic performance and classroom engagement. By equipping educators with adaptive learning strategies, it can lead to a more practical teaching approaches; such as flexible deadlines, differentiated instruction, or less stress-reducing classroom practices. Hence, the app can serve not only as a diagnostic tool but also as a guide for creating more supportive learning environments. This dual function would allow educators to respond with sensitivity in both academic and pastoral roles, ensuring that students facing mental health risks are not only referred for treatment but also supported in their day-to-day learning journey.

Table 3 List of Novelty and Recommendations of CaknaMinda

Novelty	Recommendations
• Educator-centered approach to fill counselling gaps (ratio 1:3000 / 1:1500).	• Pilot in UiTM and expand to other Higher Education Institutions (IPT).
• Goes beyond self-screening apps (MyMinda, Mental SEHAT) by involving educators.	• Train educators to interpret results and act as first responders.
• Traffic-light risk system (green, yellow, orange, red) for clear action steps.	• Add long-term monitoring to track students' mental health across study years.
• Results designed to create urgency, not just inform.	• Provide adaptive learning strategies to help educators reduce stressors (workload, exams, deadlines).

ACKNOWLEDGEMENTS

The authors would like to express their deepest gratitude to Universiti Teknologi MARA (UiTM) Negeri Sembilan for providing the platform and support to carry out this project. Special thanks are extended to Mr. Nasrullah Zainal Abidin, Senior Psychology Officer, for his expert insights on the clinical validity of the app, as well as to all lecturers Dr. Wan Nor Aisyah, Suhaila Sharil, Assoc. Prof Dr. Khairul Hamimah Mohammad Jodi, Dr. Adnan, and Dr. Hidayat, and Nurul Sakinah for their valuable testimonies that helped strengthen the potential findings.

The authors also wish to acknowledge the contributions of the project team members: Dr. Nursafra, for providing overall guidance; Aiman Mudzafar, for programming and coding the app; and Siti Nur Husna and Nur Illyana Natasha, for designing the project template. Their dedication and collaboration were essential if not crucial for the successful completion of this work.

REFERENCES

1. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). American Psychiatric Publishing.
2. Boone, H. N., & Boone, D. A. (2012). Analyzing Likert Data. The Journal of Extension, 50(2), Article 48. https://doi.org/10.34068/joe.50.02.48

3. Institute for Public Health. (2019). National Health and Morbidity Survey (NHMS) 2019: Non-communicable diseases, healthcare demand, and health literacy. Ministry of Health Malaysia. https://iku.moh.gov.my/images/IKU/Document/REPORT/NHMS2019/Report_NHMS2019-NCD_v2.pdf
4. Institute for Public Health. (2022). Adolescent Health Survey (AHS) 2022. Ministry of Health Malaysia. https://iku.gov.my/images/nhms-2022/Report_Malaysia_nhms_ahs_2022.pdf
5. Institute for Public Health. (2023). National Health and Morbidity Survey (NHMS) 2023: Fact sheet – Non-communicable diseases & risk factors. Ministry of Health Malaysia. https://iku.nih.gov.my/images/nhms2023/fact-sheet-nhms-2023.pdf
6. Kay, S. R., Fiszbein, A., & Opler, L. A. (1987). The Positive and Negative Syndrome Scale (PANSS) for schizophrenia. Schizophrenia Bulletin, 13(2), 261–276. https://doi.org/10.1093/schbul/13.2.261
7. Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behaviour Research and Therapy, 33(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-U
8. Ministry of Health Malaysia. (2023, May 24). MySejahtera app rolls out new Minda Sihat feature focusing on mental healthcare. MOH Malaysia. https://www.moh.gov.my
9. Nor Ainna Hamzah. (2025, July 6). Pelajar Universiti jatuh Tingkat 4, dakwa dengar bisikan. Akhbar Kosmo!.https://www.kosmo.com.my/2025/07/06/pelajar-universiti-jatuh-tingkat-4-dakwa-dengar-bisikan/
10. Nyutu, E. N., Cobern, W. W., & Pleasants B. A-S. (2021), Correlation study of student perception of their undergraduate laboratory environment with respect to gender and major. International Journal of Education in Mathematics, Science and Technology (IJEMST), 9(1), 83-102. https://doi.org/10.46328/ijemst.1182.
11. Selangor State Government. (2021, August 11). Selangor launches SEHAT to tackle mental health issues. Selangor Journal. https://selangorjournal.my
12. Unit Pengurusan Psikologi, BDSP MOF. (n.d.). Ujian Minda Sihat: Depression Anxiety Stress Scales (DASS). Kementerian Kewangan Malaysia.
13. Universiti Teknologi MARA (UiTM). (2025, April 18). Mesyuarat Pengurusan Dalaman Kampus Rembau: Laporan saringan kesihatan mental pelajar baharu (SkeM-P). UiTM Negeri Sembilan.
14. University Technology MARA Negeri Sembilan. (n.d.). Direktori staf. UiTM Negeri Sembilan. https://nsembilan.uitm.edu.my/,https://nsembilan.uitm.edu.my/seremban/https://nsembilan.uitm.edu.my/rembau/