UNIVERSIDADE
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FINAL REPORT

The First Integrative Medicine Training Course at Universidade Eduardo Mondlane: Fostering Holistic Healthcare Practices

(June 2024 – June 2025)

Maputo, July 16, 2025

Project Funded by: WEIL FOUNDATION

FINAL REPORT

Project Title:
The First Integrative Medicine Training Course at Universidade Eduardo Mondlane: Fostering Holistic Healthcare Practices

Implementing Institutions:
Universidade Eduardo Mondlane (UEM)
Faculty of Sciences, Department of Biological Sciences
Mozambique

Project duration:
June 2024 – June 2025

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FOREWORD

Implementing the first Integrative Medicine course at Universidade Eduardo Mondlane was both an honor and a transformative experience. As the Principal Investigator, I witnessed firsthand the enthusiasm and dedication of students who had long awaited an opportunity to engage with these topics in a structured and evidence-informed manner, particularly given that our medical curricula have no formal training in Integrative Medicine. This was the first time such a course had been introduced at our institution, and its success confirmed the need to create academic spaces for integrative medical practices.

From the beginning, this initiative was conceived not only as a training program but also as a platform to promote respect for cultural diversity in health, to understand complementary and alternative practices, and to offer tools for the critical evaluation and integration of evidence-based practices.

It was particularly significant to observe how students embraced this vision, expressing joy, curiosity, and a genuine desire to advance integrative approaches in their future careers. We received numerous messages from students expressing sincere appreciation.

This project also contributed meaningfully to gender equity, with a high level of female participation, and supported the professional development of aspiring health professionals in Mozambique. The training supported greater understanding of complementary and alternative therapies that are increasingly common in both rural and urban settings in Mozambique, often used without clinical guidance.

We are profoundly grateful to the Weil Foundation for their trust and generous support, which enabled us to offer high-quality training in Integrative Medicine for healthcare students. This project is already contributing to meaningful change in Mozambique, by demonstrating that Integrative Medicine can be effectively integrated into health education and adapted to local healthcare services in an evidence-based, culturally appropriate manner. The project also fostered greater awareness, expanded training opportunities, and opened pathways for more inclusive, patient-centered approaches to healthcare.

Dr. Delfina Fernandes Hlashwayo
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1. GRAPHICAL ABSTRACT

Context and objective:

- **First tuition-free training course** on Integrative Medicine at Universidade Eduardo Mondlane in Mozambique
- Goal: Develop medical and health students' competencies in **Integrative Medicine**

Methods

- **1–year** project (June 2024–July 2025)
- We implemented **2 editions** of the course (1 week **in–person** in September 2024 and **8–week online** from January–February 2025)
- Interactive lectures, lab sessions, participatory exercises, forums, final assessment
- **Mixed-methods evaluation** (pre/post course, focus groups, exam)

Participants & data:

- **400+** applications
- 164 enrolled: **134 completed** (**82%;** 29 *in-person*; 105 *online*)
- **81%** female; mean age **23 years**
- **61%** medical students; **10** academic institutions

Outcomes & Impact

- ↑ knowledge, competencies, and attitudes ($p < 0.05$)
- Average exam final score: **18/20**
- Strengthened **laboratory capacity** at UEM Faculty of Sciences
- ↑ **understanding** of phytotherapy, aromatherapy, traditional medicine, nutrition, mental well-being, and the role of scientific evidence in **Integrative medicine**.

2. EXECUTIVE SUMMARY

This project successfully implemented Mozambique's first Tuition-Free short course in Integrative Medicine, addressing a significant gap in the training of future healthcare professionals. The course was developed and delivered by the Department of Biological Sciences at UEM, with the support of the Weil Foundation. It targeted undergraduate and graduate students in medicine, biomedical sciences, and related health fields across public and private institutions.

The project aimed to promote a holistic, evidence-informed approach to healthcare. Key themes included phytotherapy, aromatherapy, nutrition, mental well-being, African traditional medicine, and scientific evidence on integrative medicine.

Two course editions were delivered: (1) an intensive 5-day in-person course in September 2024, and (2) an 8-week online edition from January to February 2025, adopted in response to sociopolitical constraints. The transition to online delivery expanded accessibility and participation. Course content was developed, facilitators were recruited, and outreach was conducted through universities and digital platforms..

A total of 478 applications were received; 164 students enrolled and 134 completed the course, resulting in an 82% completion rate. Most participants were women (81%), and 61% were medical students. Evaluation employed a mixed-methods approach, including pre- and post-course surveys, focus groups, and final assessments. Results demonstrated significant gains in knowledge, attitudes, and skills ($p < 0.05$) in Integrative Medicine, with 66% of students rating the course at the highest level. Phytotherapy was rated as the most appreciated topic, followed by traditional medicine, mental well-being, and nutrition. The participatory approach was identified as the preferred teaching method by 63% of students.

The course was presented at the UEM Faculty of Sciences Scientific Conference has been submitted for presentation at the XIII UEM Scientific Conference in September 2025. A manuscript summarizing the outcomes was submitted to a PubMed-indexed journal in April 2025 and is under editorial consideration.

In conclusion, the project introduced Integrative Medicine to a diverse group of future healthcare professionals. Both in-person and online formats effectively engaged students and built essential skills. The initiative equipped graduates to advance inclusive, patient-centered and evidence-based integrative medicine practices nationwide.

We extend our sincere gratitude to the Weil Foundation for its generous financial support and for believing in the value of this pioneering initiative.

Alignment with the Sustainable Development Goals

This project aligns with the following United Nations Sustainable Development Goals (SDGs):

The project contributes directly to SDG 3 (Good Health and Well-being) by educating future healthcare professionals on holistic and evidence-informed approaches to health; SDG 4 (Quality Education) by providing innovative, inclusive, and interdisciplinary training opportunities; and SDG 17 (Partnerships for the Goals) through collaborative efforts among academic institutions, facilitators, and students from diverse backgrounds.

3. BACKGROUND

Mozambique, located in southeastern Sub-Saharan Africa and home to over 35 million inhabitants, faces a dual burden of disease: persistent infectious diseases such as HIV/AIDS, tuberculosis, and malaria, alongside a rising prevalence of noncommunicable diseases [1, 2].

Despite ongoing public health efforts, access to healthcare services remains limited. Only 47% of the population has direct access to medical care. As a result, a large proportion of the population relies on traditional medicine to meet their health needs [3-9]. This reliance reflects not only systemic barriers to medical care, but also deeply rooted cultural and spiritual beliefs about health, illness, and healing.

Recent research supports the centrality of traditional and complementary practices in Mozambique's therapeutic landscape. The country's first ethno-nursing study, conducted in Pemba (northern Mozambique), found that health-seeking behaviors are shaped by beliefs in supernatural causes of illness and dissatisfaction with public medical services [3].

Another study conducted in Maputo revealed that 51.3% of rural and 16% of urban children sampled had received traditional medicine before accessing formal healthcare [10]. A 2024 survey documented 731 plant taxa with medicinal uses in Mozambique [11]. Together, these data illustrate the breadth and depth of complementary and alternative health practices across the country.

In parallel, new dynamics are emerging, especially in urban areas. Practices such as acupuncture have been introduced in some public hospitals, and Chinese medicine clinics are active in the capital, Maputo city. The popularity of aromatherapy, meditation, and other mind-body modalities is increasing among younger and urban populations, often influenced by global health trends. However, in the absence of structured clinical or educational frameworks, many individuals navigate a fragmented and informal system, mixing medical and alternative treatments without professional guidance.

Integrative Medicine emphasizes the interconnectedness of physical, mental, emotional, and social health. By combining conventional medical approaches with evidence-based complementary and traditional therapies, it offers a model for more person-centered, culturally sensitive, and effective care. Internationally, Integrative Medicine is increasingly recognized for its potential to enhance health outcomes and support more comprehensive approaches to healthcare. In Mozambique, however, there are no formal training programs or curricular components dedicated to this field, and its potential remains largely unexplored at the institutional and policy levels.

To address this gap, Universidade Eduardo Mondlane (UEM), Mozambique's oldest and largest public university, launched the country's first tuition-free Integrative Medicine Training Course, made possible through a USD 28,500 grant from the Weil Foundation (USA). The course was implemented between 2024 and 2025.

UEM is the leading national institution for the education of physicians and health professionals, offering undergraduate and postgraduate training across a broad range of disciplines.

Within UEM, the Faculty of Sciences was well-positioned to lead this initiative. With strong academic programs in biomedical sciences, biosciences, and public health, the faculty hosts leading national experts in complementary and alternative medicine, ethnobotany, ethnopharmacology, and nutrition. Its flagship program, Biology and Health, has played a key role in training researchers and health professionals across the country. Furthermore, its ongoing collaboration with the Faculty of Medicine has enhanced its capacity to design and deliver high-quality, interdisciplinary health education.

This pioneering training initiative aimed to build capacity, raise awareness, and cultivate a diverse cohort of students trained in integrative medicine. The long-term vision was to lay the groundwork for the future establishment of postgraduate programs in this field and to contribute to the integration of holistic, evidence-based, and culturally relevant approaches into the Mozambican healthcare system.

Figure 1. Exterior view of the Department of Biological Sciences, Faculty of Sciences, Universidade Eduardo Mondlane

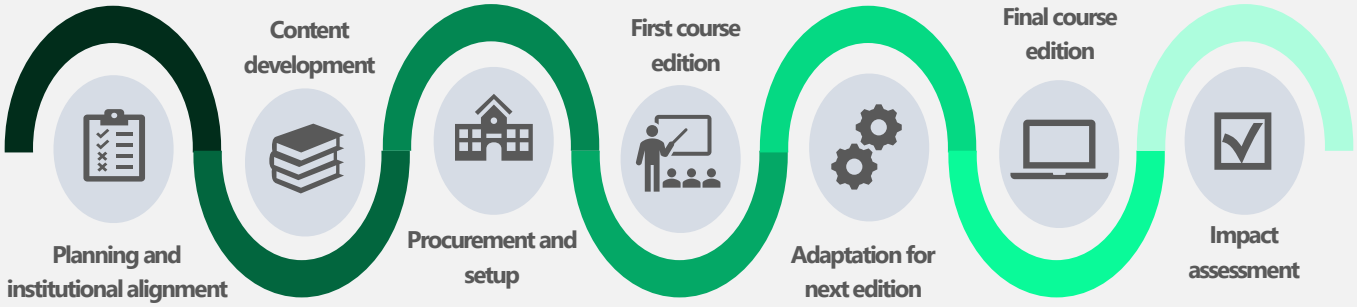
4. OBJECTIVES

The primary objective of the grant proposal was to establish the first tuition-free course in integrative medicine designed for healthcare students, encompassing medical, biomedical, and other individuals enrolled in health-related programs at UEM and other higher education institutions in Mozambique.

This pioneering initiative aimed to address the existing training gap and equip future healthcare professionals with a holistic understanding of integrative medicine, fostering a comprehensive approach to healthcare practices. By extending this opportunity to students from various institutions, the goal was **to cultivate a diverse and skilled cohort prepared to contribute to the integration of holistic healthcare principles in the broader healthcare landscape of Mozambique**.

5. METHODOLOGY

The implementation of this project followed a structured yet adaptive approach, guided by the academic calendar, student availability and the broader sociopolitical context in Mozambique. The flowchart below provides a visual overview of the main phases of the project, followed by a detailed description of each stage.



5.1. Planning and institutional alignment *[June 2024]*

The Principal Investigator held planning meetings with the Deputy Director of the Faculty of Medicine to discuss the best timing and structure for the course, considering the academic workload of medical students. It was agreed that the first edition would be delivered as a one-week intensive course during the mid-semester break (September 16–20, 2024). The project team then finalized this format and communicated it to the funder. The Faculty of Medicine agreed to support dissemination and encourage student participation.

5.2. Course content development and ethical approval *[June-July 2024]*

The course outline was developed in collaboration with faculty experts. Facilitators were invited and tasked with developing thematic modules and educational materials. Concurrently, a research protocol to assess the course's educational impact was developed and submitted for ethical review. The protocol was approved on July 5, 2024 (Ref. CIBSFM&HCM/66/2024).

5.3. Procurement, infrastructure setup and dissemination *[July – September 2024)*

From July to September 2024, all necessary materials were purchased, including laboratory equipment (e.g., Soxhlet extractor, Clevenger, rotavapor), phytochemistry reagents, educational supplies, books, promotional materials, and consumables to support in-person sessions. A promotional flyer was designed and disseminated through institutional notice boards, partner health institutions, WhatsApp groups, and LinkedIn. Authorization was obtained to use classrooms and laboratories at the Department of Biological Sciences.

5.4. First course edition (In-Person) *[September 2024]*

The first edition was implemented from September 16 to 20, 2024, consisting of daily sessions from 8:00 AM to 1:00 PM. The edition included lectures, group activities, laboratory sessions, practical demonstrations, participatory methods (such as guided exercises and discussions), and interactive assignments. Standardized assessments were conducted before and after the course. Data were collected for the impact evaluation study.

5.5. Adaptation due to sociopolitical constraints *[October – December 2024]*

In late 2024, due to rising political instability and safety concerns in Mozambique, a change in delivery format was proposed and approved by the funder. The three originally planned in-person cohorts were consolidated into a single extended online edition, allowing the participation of all eligible candidates.

5.6. Final course edition (online) *[January – February 2024]*

The online edition ran for 8 weeks (January to February 2025), followed by a final assessment (week 8). Each week featured recorded lectures, thematic assignments, discussion forums, and live Q&A sessions (via Google Meet). Pre-recorded lab demonstrations were also included. Communication with students was maintained via WhatsApp and email. This format expanded geographic access and ensured continuity despite national disruptions. The course syllabi for the in-person and online formats are provided in **Supplementary file 1**.

5.7. Post-implementation and impact assessment *[February – June 2024]*

Following the implementation of the final edition, certificates of completion were issued, signed by the Faculty Director, scanned, and individually sent to all participants, along with their final examination results.

As part of the project's dissemination strategy, opportunities for presenting the course and its activities were identified, including participation in institutional and national scientific conferences. A mixed-methods evaluation was used to assess the educational impact of the course on participating students. Pre- and post-course self-assessment surveys, final exams, course evaluations, and focus group discussions were used to capture changes in knowledge, attitudes, and competencies. Quantitative data were analyzed using statistical methods including the Wilcoxon signed-rank test to assess pre/post differences. Following data analysis, a manuscript summarizing the educational impact of the course was prepared and submitted to a peer-reviewed journal.

6. RESULTS

6.1. Expected outcomes as defined in the grant proposal

I. Enhanced holistic understanding

The successful training of approximately **120** healthcare students, including both undergraduate and postgraduate participants, would result in a cohort of professionals with a comprehensive understanding of integrative medicine. The training would contribute to a shift towards patient-centered care, emphasizing the importance of addressing not only physical ailments, but also considering spiritual, cultural, and psychological dimensions.

II. Research advancements and strengthened collaborations

The course was expected to stimulate interest and research in integrative medicine within the academic community, potentially leading to innovative healthcare solutions grounded in traditional and modern practices. The initiative would facilitate collaborations between healthcare students, professionals, researchers, and traditional healers, fostering a more integrated and collaborative healthcare system.

III. Seed for postgraduate programs and international recognition

The course would serve as a foundation for a future post-graduate program in integrative medicine, encouraging continued education and specialization in this field. Furthermore, establishing the first tuition-free course in integrative medicine would garner national and international recognition for UEM and contribute to the university's reputation as a leader in healthcare education and innovation.

6.2. Summary table of achievements

The project achieved its primary goals, demonstrating both quantitative success and qualitative impact. Across all editions, a total of **134** health students successfully completed the course, with 61% enrolled in medical programs, including three at the postgraduate level.

There were significant improvements in students' knowledge, attitudes, and competencies related to Integrative Medicine. The initiative also contributed to enhanced institutional capacity for future program development, fostered greater awareness, and promoted interdisciplinary dialogue. These outcomes collectively laid the foundation for sustainable advancement of Integrative Medicine within the academic setting in Mozambique.

Table 1 presents a summary of the three expected outcomes, and the corresponding achievements recorded during the implementation period.

Table 1. Summary of expected outcomes and achievements.

Expected Outcome	Indicators	Achievements
I. Enhanced Holistic Understanding	**A. Profile and participation** ▪ Number of students trained. ▪ Number of medical students. ▪ Scholar level of participants. ▪ Completion rates. ▪ Number of institutions reached. ▪ Number of editions delivered.	▪ 134 students trained. ▪ 82 (61%) medical students. ▪ 131 undergraduate students, 3 graduate students. ▪ Completion rate: 82% (134/164 enrolled). ▪ 10 institutions reached across the country. ▪ 2 editions delivered (1 in-person, 1 online).
	B. Learning and performance ▪ % approval on final exam. ▪ Average score on final exam. ▪ Pre/post assessments (knowledge, attitudes, competencies).	▪ All exam participants (100%) passed. ▪ Average score of 18/20. ▪ Pre/post assessments showed statistically significant improvement (Wilcoxon, $p < 0.05$).
	C. Course design and content ▪ Integration of holistic concepts in course design.	▪ Course content incorporated physical, mental, emotional, cultural, and traditional health.
II. Research Advancements and Strengthened Collaborations	**A. Ethical and research framework** ▪ Ethics approval for course impact assessment. ▪ Research tools developed.	▪ Research protocol approved (Ref. CIBSFM&HCM/66/2024). ▪ Pre- and post-course surveys completed.
	B. Data collection and dissemination ▪ Data collected for publication. ▪ Data analysis.	▪ Full dataset was successfully collected. ▪ Quantitative and qualitative data were analyzed.
	C. Collaborations and networking ▪ Number of facilitators in course delivery. ▪ Number of research projects initiated or proposed related to integrative medicine course. ▪ Collaborative initiatives.	▪ 9 faculty members and 2 laboratory assistants participated in course delivery. ▪ 1 self-funded ethnobotanical research project proposed by a course participant, focused on traditional uses of Mozambican plants. ▪ Collaboration between Faculty of Sciences and Faculty of Medicine for course implementation.
	D. Engagement & Feedback ▪ Student and faculty feedback on motivation for research and collaboration.	▪ Participants reported increased interest in integrative medicine and interdisciplinary collaboration (based on evaluation forms). Facilitators are also motivated for collaboration.
III. Seed for Postgraduate Programs and International Recognition	**A. Foundations for Postgraduate Program Development** ▪ Laboratory infrastructure to support postgraduate components. ▪ Internal planning on course sustainability and scale-up.	▪ Soxhlet, Clevenger, rotavapor, reagents, and phytochemistry supplies acquired and tested. ▪ Coordination meetings held to explore future institutional integration.
	B. Institutional Recognition ▪ Feasibility of tuition-free postgraduate program. ▪ Scientific visibility through conferences. ▪ Manuscript submission to indexed journal. ▪ Qualitative feedback on institutional relevance and interest.	▪ The course provides a foundation demonstrating feasibility for postgraduate education. ▪ 1 presentation in 2024; 2 more scheduled for 2025 ▪ Manuscript submitted to *Annals of Global Health* (April 28, 2025). ▪ The course received strong institutional support and visibility. Students and facilitators expressed support for advancing academic training in the field.

6.3. Achievements across both course editions

Through this project, two editions of the Integrative Medicine Course were successfully implemented. The first edition, delivered in person from 16–20 September 2024, resulted in 29 graduates. The second edition, conducted online from 6 January to 27 February 2025, concluded with 105 graduates. The course attracted considerable interest, with 478 applications received (some of which were duplicates). A total of 164 students were enrolled in both editions, and 134 completed the program, resulting in an overall completion rate of 82%.

Participants were predominantly female (81%), with an average age of 23 years. A majority were enrolled in Medicine (61%), and three students were pursuing postgraduate studies (master's and PhD) (**Table 2**). The Universidade Eduardo Mondlane accounted for 48% of all participants, with students also coming from nine other higher education institutions.

Prior to the course, 33% of students reported having used complementary and alternative medicine (CAM), most commonly dietary supplements, meditation, and phytotherapy. None had previously participated in a dedicated course on Integrative Medicine, underscoring the pioneering nature of this initiative. Students expressed strong motivation to explore integrative approaches and a clear interest in deepening their understanding to inform future professional practice.

Table 2. *Characteristics of participants in the Integrative Medicine course.*

Category	1st edition (n=29)	2nd edition (n=105)	Total (n=134)
Gender			
Male	7 (24%)	19 (18%)	26 (19%)
Female	22 (76%)	86 (82%)	108 (81%)
Age (average ± SD)	23 ± 3.9	23 ± 3.6	23 ± 3.7
Main higher education institutions			
UEM	21 (72%)	43 (41%)	64 (48%)
ISCTEM†	5 (17%)	40 (38%)	45 (34%)
ISCISA‡	2 (7%)	10 (10%)	12 (9%)
USTM§	0 (0%)	5 (5%)	5 (4%)
Others	1 (4%)	7 (7%)	8 (6%)
Enrolled academic program			
Medicine degree	24 (83%)	58 (55%)	82 (61%)
BSc in Biology and Health	2 (7%)	20 (19%)	22 (16%)
BSc in Public Health	0 (9%)	5 (5%)	5 (4%)
BSc in Psychology	1 (3%)	4 (4%)	5 (4%)
BSc in Biomedical Laboratory Technology	0 (0%)	5 (5%)	5 (4%)
BSc in Nutrition	1 (3%)	3 (3%)	4 (3%)
Others	1 (3%)	10 (10%)	11 (8%)
Year of study			
1-2	17 (59%)	18 (17%)	35 (26%)
3-4	8 (28%)	63 (60%)	71 (53%)
5-6	4 (14%)	24 (23%)	28 (21%)
Previous training in CAM			
No	26 (90%)	68 (65%)	94 (70%)
Yes	3 (10%)	37 (35%)	40 (30%)
Previous use of CAM			
No	17 (59%)	73 (70%)	90 (67%)
Yes	12 (41%)	32 (30%)	44 (33%)

† *Instituto Superior de Ciências e Tecnologia de Moçambique*
‡ *Instituto Superior de Ciências de Saúde*
§ *Universidade São Tomás de Moçambique*

Detailed demographic data and additional results were included in the manuscript entitled "*Transforming Healthcare: Mozambique's Pioneering Integrative Medicine Course*", which was submitted to *Annals of Global Health*.

6.4. First edition (In-person)

The first edition of the Integrative Medicine course was conducted in person from September 16 to 20, 2024, during the mid-semester break at Universidade Eduardo Mondlane, enabling full-time student participation without conflict with regular academic activities. The course comprised a total of 25 contact hours delivered in daily sessions.

A total of 239 applications were received (including duplicates), from which 30 students were selected based on eligibility and motivation criteria. Of these, 29 students successfully completed the course (**Figure 2**), resulting in a 97% completion rate. Participants primarily came from Medicine and Biology and Health programs and demonstrated strong enthusiasm and curiosity about Integrative Medicine.

Figure 2. Participants and facilitator (in the middle) of the first edition of the Integrative Medicine course.

The course was led by doctoral-level experts and highly experienced professionals, supported by assistants with substantial practical expertise. The course combined theoretical and practical components emphasizing critical reflection and cultural sensitivity. **Figure 3** presents the main thematic areas addressed in this first edition.

Figure 3. Overview of the main topics covered in the first edition of the course.

- Introduction to Integrative Medicine and Complementary and Alternative Therapies
- Scientific evidence supporting Integrative Medicine
- Integrative practices for Mental Well-Being
- African and Mozambican Traditional Medicine
- Phytotherapy
- Aromatherapy
- Nutrition and emotional well-being

Simulation exercises, such as mock consultations involving patients using traditional medicine, enabled students to practice respectful communication and integration of traditional knowledge in clinical settings (**Figure 4**).

Figure 4. Simulated consultation exercise in which students practiced responding to a patient reporting the use of traditional medicine.

The activity aimed to develop communication skills and cultural sensitivity in clinical interactions.

Laboratory practical sessions (**Figure 5**) included essential oil extraction, phytochemical screening, the production of aromatic soaps, candles and herbal salves, as well as the nutritional assessment of typical Mozambican meals. These activities enhanced students' applied understanding of medicinal plant properties and nutritional science.

Figure 5. Students participating in phytochemical laboratory sessions during the course.

Students received training on scientific evidence and on how to utilize scientific databases to critically appraise literature related to CAM and integrative medicine.

Course logistics included the provision of course kits and daily refreshments, fostering a conducive learning environment. All planned assessment tools, pre- and post-tests, questionnaires, evaluations, and discussion forums, were implemented, with certificates signed by the Faculty Director awarded at the course conclusion (**Figure 6**).

Figure 6. Group photo at the end of the first edition of the Integrative Medicine course, featuring students and selected facilitators at the Faculty of Sciences, Universidade Eduardo Mondlane

This pilot edition demonstrated the course's relevance, delivery feasibility, and strong student engagement, marking a foundational step towards incorporating holistic health approaches into Mozambique's health education curricula.

6.5. Second edition (online)

The second edition of the Integrative Medicine course was delivered fully online as an eight-week program, allowing students more time to assimilate the material while accommodating their academic commitments. This edition received 185 new applications and 54 reapplications from previous candidates who were not selected for the first edition and expressed interest in future editions.

Eligibility criteria were applied, excluding applicants outside the health field, those who submitted incomplete applications, those not enrolled in academic programs, and those who did not respond to follow-up communications. All eligible students who expressed interest were admitted. This format enabled broader participation beyond Maputo city, enrolling a total of 134 students, of whom 105 successfully completed the course.

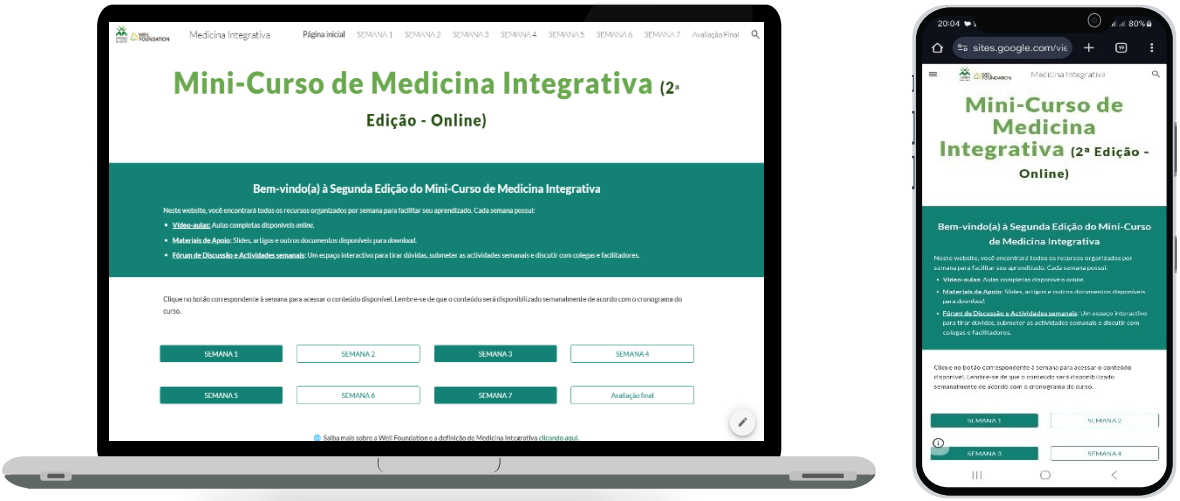
The course content was organized into weekly thematic modules (**Figure 7**).

Figure 7. Main thematic modules of the second edition (Online)

Week 1: Introduction to Integrative Medicine
Week 2: Scientific evidence in Integrative Medicine and Mental Well-Being
Week 3: African and Mozambican Traditional Medicine
Week 4: Phytotherapy and use of medicinal plants
Week 5: Aromatherapy
Week 6: Laboratory demonstrations of phytotherapy and aromatherapy
Week 7: Nutrition and Well-Being
Week 8: Final Evaluation

The course was hosted on Google Sites (**Figure 8**) and incorporated pre-recorded lectures averaging one-hour, interactive forums and quizzes using Slido (https://www.slido.com/) and practical assignments. Weekly live sessions of 40 minutes were held every Friday at 7:00 pm via Google Meet to review key concepts and address participants' questions. Materials were provided via an embedded shared Google Drive. Communication was supported through a dedicated WhatsApp group and weekly instructional emails. Students completed brief weekly assignments aligned with the thematic topic of each week, proposing practical solutions or initiatives related to integrative medicine within the Mozambican context (**Figures 9 and 10**).

Figure 8. Course Homepage (Google Sites): desktop and mobile views

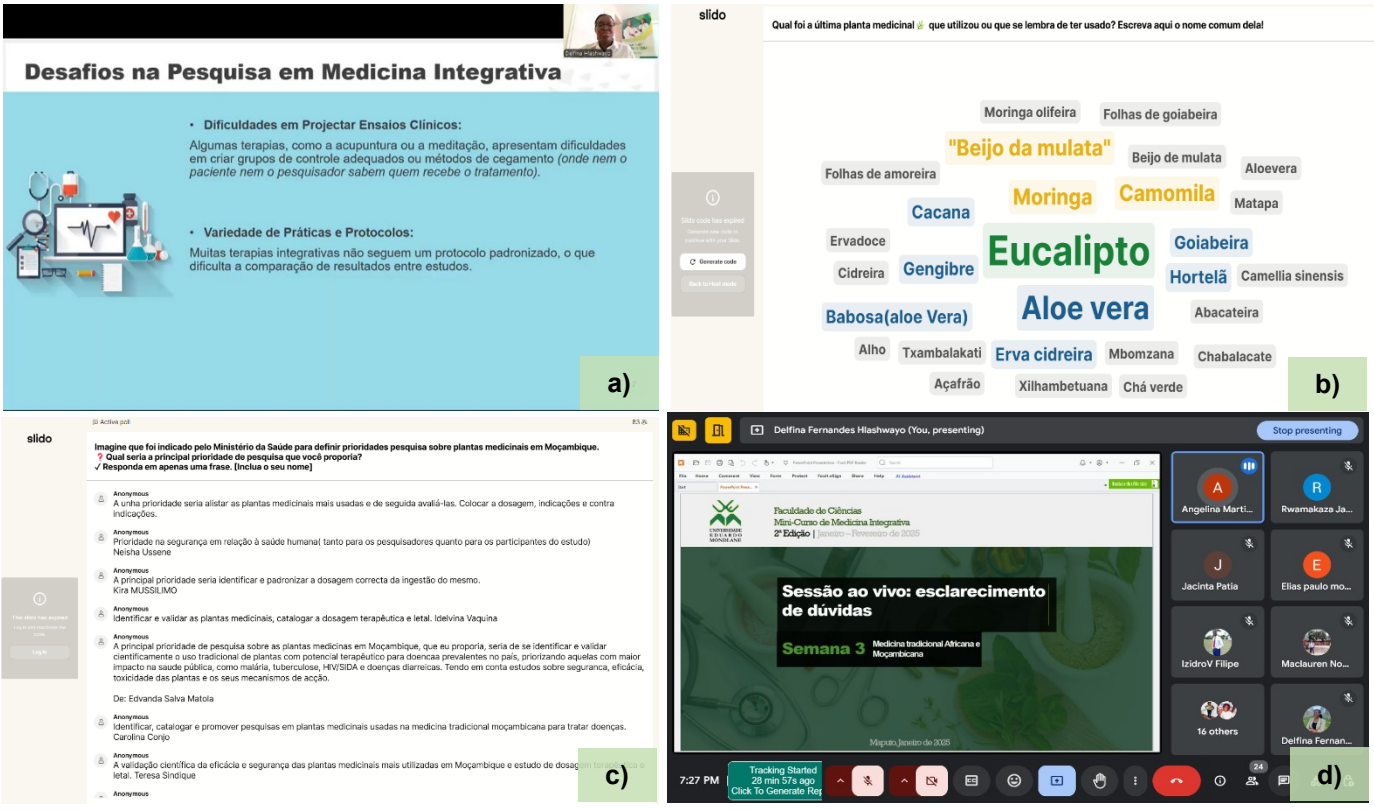


The page included a welcome message, weekly module navigation (via top menu and buttons), and links introducing the Weil Foundation and the concept of integrative medicine.
The site is no longer publicly accessible but remains archived.

Figure 9. Sample module webpage from Week 5 of the online edition

Each module page featured the weekly topic and a thematic image, followed by interactive buttons directing students to the quiz, support materials, recorded lecture, weekly assignment, peer submissions, and a discussion forum with the module facilitator. Brief notes about the facilitator were also included at the bottom of the page.

Figure 10. Illustrative elements of the online course.



(a) Screenshot of one of the recorded lectures made available through the course platform; **(b)** Student responses to a weekly quiz (*Week 4, which asked about recent personal use of medicinal plants*); **(c)** Student submissions for the Week 4 assignment on priority areas for phytotherapy research in Mozambique; **(d)** Live session held via Google Meet, as part of the weekly engagement strategy.

Most lectures were delivered as pre-recorded Zoom videos. Practical laboratory sessions, including essential oil extraction, phytochemical analysis, and the production of aromatic soaps, candles, and herbal salves, were recorded by the facilitator to demonstrate hands-on procedures (**Figures 11 and 12**).

Figure 11. Recorded laboratory demonstrations for online delivery by facilitator Mrs. Amélia Furvela

Demonstrations included essential oil extraction using a Clevenger apparatus and phytochemical screening techniques applied to selected medicinal plants.

Figure 12. Demonstrations of herbal salve, aromatic candle, and soap preparation.

Screenshots from recorded demonstrations showing the step-by-step preparation of an herbal salve, an aromatic candle, and an aromatic soap. These activities were designed to translate theoretical knowledge into hands-on experience with locally relevant applications of medicinal and aromatic plants.

Despite the sociopolitical instability that affected Mozambique between October 2024 and March 2025, the transition to an online format was successfully implemented and proved highly effective. Although not originally foreseen in the project design, the adaptation leveraged available digital tools and instructional experience to ensure continuity and maintain the quality of delivery.

This format allowed broader participation beyond Maputo city, reaching a more diverse group of students. Ongoing communication through online platforms sustained engagement throughout the course. Weekly assignments encouraged the development of practical proposals and context-specific ideas in the field of integrative medicine, while facilitators remained accessible via live sessions and interactive tools such as discussion forums. This shift to an online delivery model demonstrated that digital adaptation is a viable approach for integrative medicine education in Mozambique.

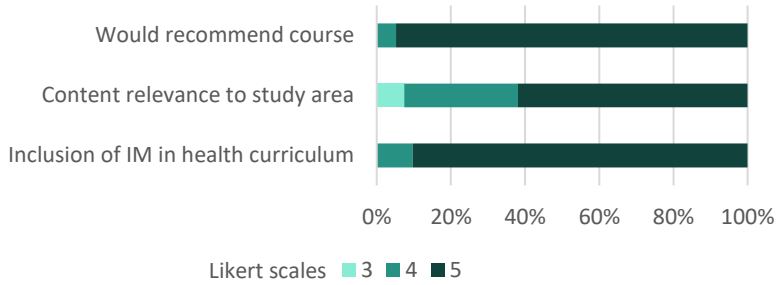
6.6. Student feedback and learning evaluation

The course received high satisfaction ratings and demonstrated strong student engagement across both in-person and online editions. It led to significant improvements in students' attitudes, perceptions, and interest in Integrative Medicine, as well as their self-reported skills in integrative approaches. Overall, students showed enhanced knowledge, more refined perspectives, and increased preparedness to apply Integrative Medicine in their future professional practice.

Interactive teaching methodologies were consistently commended, with students valuing discussions, group activities, and the accessibility of facilitators. The in-person edition benefited from dynamic exchanges and hands-on laboratory activities, while the online edition expanded access, successfully maintaining engagement through weekly assignments, quizzes, and discussion forums.

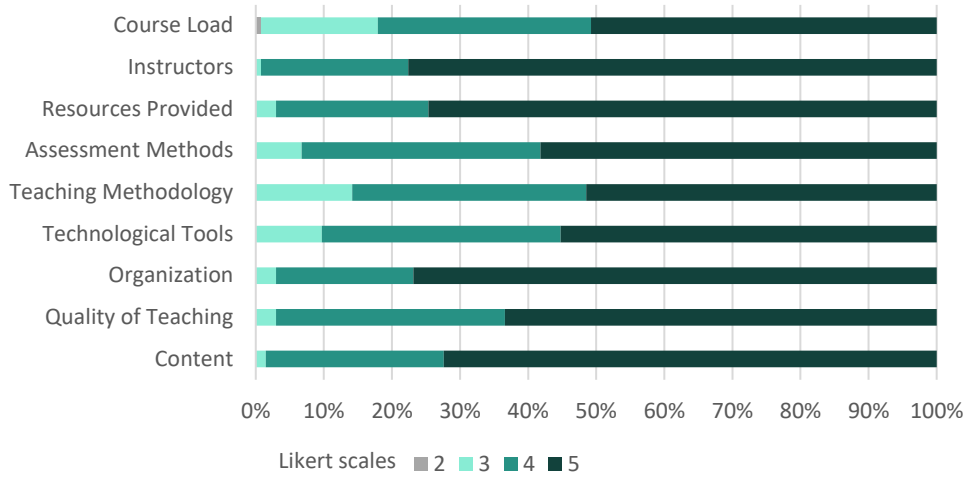
Quantitatively, 66% (89) of students awarded the course with the highest possible rating (5/5), with 32% (43) assigning a rating of 4 out of 5. Furthermore, 95% expressed that they would highly recommend the course (**Figure 13**).

Figure 13. Course satisfaction ratings: overall scores across both editions.



The most positively rated aspects (5/5) included instructor performance (78%), course organization (77%), and resources provided (75%) (**Figure 14**). Most participants (63%) expressed a preference for active and participatory learning methods. Notably, 90% rated the inclusion of integrative medicine within the health curriculum as highly important (score of 5). Regarding course content, phytotherapy emerged as the most appreciated topic (43 mentions), followed by traditional medicine (28 mentions), and mental well-being and nutrition (each with 27 mentions).

Figure 14. Overall course satisfaction ratings combined from both editions



Open-ended responses highlighted that the course fostered a holistic perspective in patient care and contributed to clarifying misconceptions surrounding complementary and alternative medicine. Students recognized the value of integrating traditional and complementary medical practices to better meet patient needs. All participants who completed the final assessment successfully passed with high average scores in both editions (overall mean: 18/20), indicating a strong understanding of Integrative Medicine concepts.

Participant Reflections

"The Integrative Medicine course will help me assess my patients holistically, taking into account spiritual, mental, physical, and cultural dimensions that are important for diagnosis—without stigma or prejudice. It will also enable me to offer a broader range of therapies that promote well-being and help patients feel more at ease."

1st-year medical student, in-person edition

"In my medical career, I believe that the knowledge I gained from this integrative medicine course will help me adopt a more holistic and human-centered approach to patient care. By combining modern medical knowledge with traditional practices and other therapies, I hope to strengthen patients' trust in healthcare providers and promote treatment diversity, giving patients the option to choose what makes them feel most comfortable."

6th-year medical student, online edition

6.7. Dissemination activities

Online dissemination strategies, including promotion via WhatsApp, Instagram and LinkedIn, contributed to significant visibility for the course. On LinkedIn, the flyer (**Figure 15**) for the first edition generated 3,294 impressions and reached 1,442 members, while flyer for the subsequent edition achieved 2,745 impressions and reached 879 members. Additionally, students shared information about the course on their own networks, further amplifying its reach.

Figure 15. Promotional flyers for the Integrative Medicine course

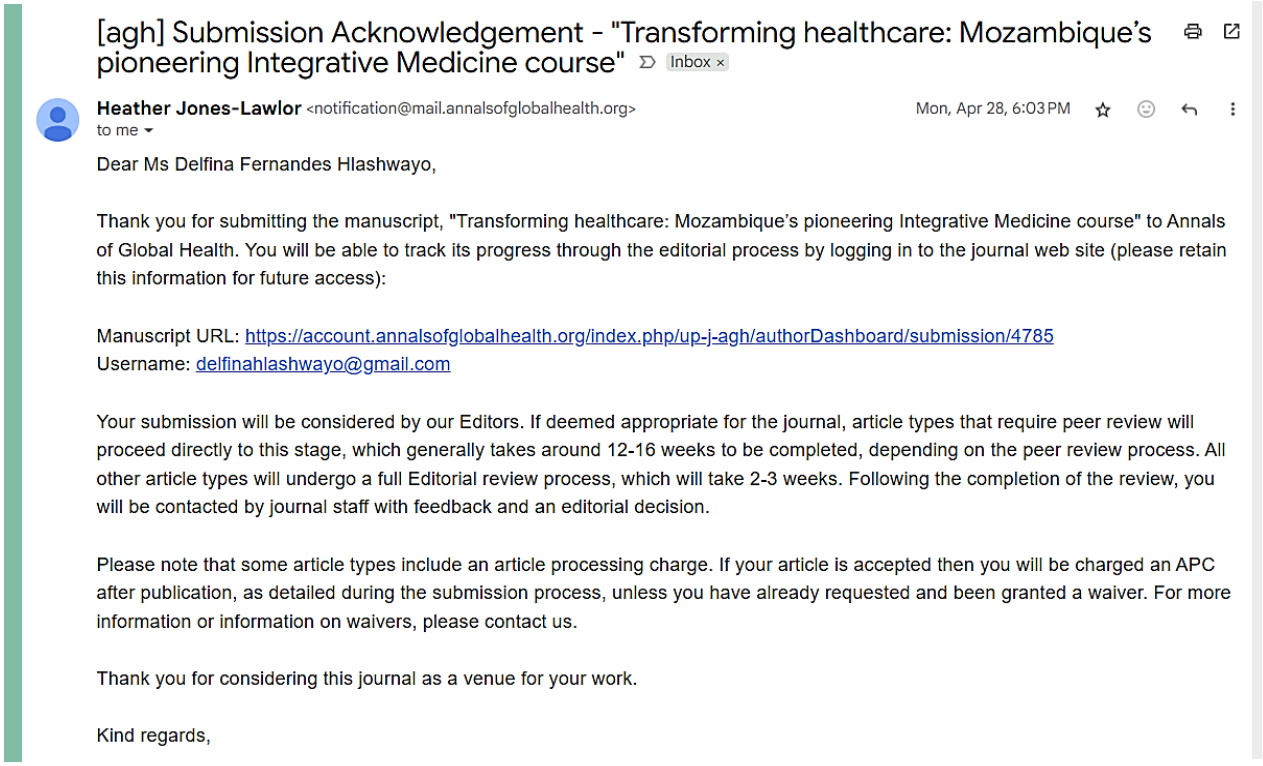
Beyond online promotion, the project was formally presented at the Faculty of Sciences Scientific Conference (September 2024) (**Figure 16**), where it received very positive feedback from faculty members, students, and researchers. The results of the course implementation were also submitted to the XIII UEM Scientific Conference, scheduled for September 2025. Being a novel short course outside the regular curriculum of the Department of Biological Sciences, the project was well received by the department, faculty, and the university overall.

Figure 16. Course collaborator Marta Maculuve presenting on behalf of the course team at the UEM Faculty of Sciences Scientific Conference, September 2024.

In recognition of the notably positive outcomes and wide dissemination within academic and professional circles, the course coordination team was formally invited to present the course results at the 2nd National Symposium on Ethnobotany of Mozambique, scheduled for 13 October 2025, as part of a roundtable discussing the importance of including ethnobotany and ethnopharmacology in medical curricula.

A manuscript summarizing the course's impact was submitted to *Annals of Global Health* (https://annalsofglobalhealth.org/) on 28 April 2025 (**Figure 17**) and is currently under editorial assessment. The Weil Foundation will be notified upon publication.

Figure 17. Screenshot of the email confirming the submission of the manuscript to *Annals of Global Health* on 28 April 2025.



[agh] Submission Acknowledgement - "Transforming healthcare: Mozambique's pioneering Integrative Medicine course" Inbox ×

Heather Jones-Lawlor <notification@mail.annalsofglobalhealth.org> Mon, Apr 28, 6:03 PM
to me

Dear Ms Delfina Fernandes Hlashwayo,

Thank you for submitting the manuscript, "Transforming healthcare: Mozambique's pioneering Integrative Medicine course" to Annals of Global Health. You will be able to track its progress through the editorial process by logging in to the journal web site (please retain this information for future access):

Manuscript URL: https://account.annalsofglobalhealth.org/index.php/up-j-agh/authorDashboard/submission/4785
Username: delfinahlashwayo@gmail.com

Your submission will be considered by our Editors. If deemed appropriate for the journal, article types that require peer review will proceed directly to this stage, which generally takes around 12-16 weeks to be completed, depending on the peer review process. All other article types will undergo a full Editorial review process, which will take 2-3 weeks. Following the completion of the review, you will be contacted by journal staff with feedback and an editorial decision.

Please note that some article types include an article processing charge. If your article is accepted then you will be charged an APC after publication, as detailed during the submission process, unless you have already requested and been granted a waiver. For more information or information on waivers, please contact us.

Thank you for considering this journal as a venue for your work.

Kind regards,

6.8. Institutional capacity and sustainability

The implementation of the Integrative Medicine course fostered important advances in institutional capacity and laid the groundwork for potential long-term integration into the academic offerings of the Faculty of Sciences. The course received broad institutional support and visibility. Internal coordination meetings were held to assess the program's outcomes and explore pathways for sustainability and future scale-up.

Strengthening of institutional infrastructure

The course contributed to strengthening laboratory capacity, particularly in preparation for future practical modules or potential postgraduate programs. The Department previously lacked key equipment for phytochemical training. Through this initiative, essential tools such as Soxhlet and Clevenger extractors, a rotary evaporator, reagents, and phytochemistry supplies were acquired and successfully used during the program. This infrastructure now represents a valuable asset for advanced training and research in Integrative Medicine.

Internal planning for sustainability

The coordination team has reflected on continuing the course as a regular short course and the potential development of a postgraduate program in Integrative Medicine. Positive feedback from students and faculty underscores its institutional relevance and guides future planning, which will depend on available resources and partnerships.

While essential laboratory infrastructure is established, sustainability will require funding for personnel and scholarships. Formal institutional evaluation and accreditation are necessary to recognize a postgraduate curriculum, which must be carefully developed to meet academic standards.

Integrating research and community outreach is expected to strengthen the program's impact and support. The course has already inspired new academic initiatives: one student proposed a self-funded ethnobotanical research project investigating the traditional uses of Mozambican plants. These developments lay a solid foundation for advancing Integrative Medicine education at Universidade Eduardo Mondlane.

7. PROJECT TEAM

The implementation and coordination of the Integrative Medicine course were supported by a dedicated team composed of academic, technical, and administrative staff. **Table 3** presents the team members' roles and core responsibilities.

Table 3. *Project personnel and their roles.*

Role	Description	Names
Principal Investigator	Overall project management, coordination, and reporting	Dr. Delfina Hlashwayo
Co- Principal Investigator	Co-led the development and implementation of the project	Prof. Dr. Alice Massingue
Senior Advisor	Provided strategic guidance and oversight throughout the project	Mrs. Filomena Barbosa
Accountant	Managed the project budget and financial reporting	Ali Abdul Abudo
Procurement Technician	Supported procurement processes and logistical needs	Constantino Novela
Administrative Assistant	Provided administrative support and managed documentation	Jaime Wate
Course coordination assistants	Assisted with student communications, logistics, and preparation of materials	Eliette Munezero, Nurah Virahsawmy & Marta Maculuve (*undergraduate students*)
Facilitators	Delivered lectures and guided discussions in course modules	Prof. Dr. Angelina Martins, Prof. Dr. Alice Massingue, Prof. Dr. Telma Magaia, Dr. Delfina Hlashwayo, Mrs. Amélia Furvela
Facilitators assistants	Assisted facilitators in delivering course lectures	Ms. Alfina Dimande*, Ms. Felda Langa, Ms. Natércia Madeira, Ms. Esperança Rafael*
Lab assistant	Prepared and supported laboratory demonstrations and recordings	Mr. José Matlombe

**Only participated in the first edition.*