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Designing a new undergraduate program in health information management to meet workforce needs in the Philippines

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Abstract

Background Health Information Management (HIM) has become critical to achieving efficient, data-driven healthcare systems globally. In low-and middle-income countries (LMICs), however, gaps in health information infrastructure and workforce preparedness remain persistent. This paper aims to describe the development and implementation of an undergraduate HIM program at Bataan Peninsula State University (BPSU), as part of a broader effort to strengthen health systems through capacity-building in digital health education.

Methods Using a qualitative case study design, the research examined policy documents, institutional records, and strategic frameworks related to HIM education in the Philippines. Data were collected through document analysis, stakeholder interviews and focus groups, curriculum mapping, and international benchmarking. The curriculum was developed through a participatory, iterative process that included expert consultation, local health system needs assessments, and alignment with the national (CHED) and international standards.

Results The BPSU HIM department offers a community-based, stakeholder-driven model for HIM education in an LMIC setting. It balances technical competencies in data management and informatics with a strong emphasis on public health relevance and local responsiveness. Key implementation outcomes include expanded stakeholder engagement, curriculum alignment with national and global standards, and partnerships with local and international development actors. The program also faced challenges such as limited faculty capacity, infrastructure constraints, and regulatory delays, which were addressed through targeted mitigation strategies such as blended learning, provisional curriculum approvals, and capacity-sharing with partner institutions.

Conclusions BPSU's HIM initiative demonstrates how regional universities in LMICs can lead in building a digitally competent health workforce aligned with both national priorities and global trends. The program offers a replicable model for other state universities, contributing to health equity and system resilience. Strategic recommendations include national curriculum standardization, regulatory support, industry-academic linkages, and research on HIM's impact on health service delivery.

Keywords Health information management, Curriculum development, Health workforce, Low-and middle-income countries, Medical education

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Introduction

Globally, the rapid advancement of medical technology and the increasing complexity of healthcare systems have driven an unprecedented demand for specialized healthcare professionals, including those trained in health information management (HIM) and health informatics [1–3]. Curriculum mapping has become a widely used approach to systematically compare and improve undergraduate medical and health curricula against national and international reference standards [4]. As countries experience socioeconomic growth, the demand for high-quality, data-driven healthcare services rises, further emphasizing the need for a workforce skilled in managing, analyzing, and protecting health information [1, 3].

The World Health Organization (WHO) projects a global shortfall of 10 million health workers by 2030, with low- and middle-income countries (LMICs) facing the greatest challenges in health workforce development, particularly in digital health and information management [5, 6]. Investment in HIM education has been shown to yield high social and economic returns, improving health outcomes, efficiency, and data-driven decision-making [7–10].

In Southeast Asia, countries such as Vietnam and Thailand have begun to address workforce gaps through targeted investments in health informatics education, international partnerships, and curriculum reform [11–13]. For example, capacity development initiatives in Vietnam's undergraduate nursing education have demonstrated the value of international collaboration and context-specific curriculum design [11]. However, the Philippines continues to face substantial shortages in HIM professionals, with limited standardized curricula and insufficient integration of HIM competencies in undergraduate health programs [14–17].

Recent Philippines's national policies, including the Commission on Higher Education (CHED) guidelines for HIM degree programs, aim to address these gaps. Yet, implementation has been uneven, especially in rural and regional areas outside major urban centers [15–17]. At the regional level, Bataan Province exemplifies these challenges. Despite recent advancements in digital infrastructure and economic development [9, 18, 19], local healthcare facilities in Bataan continue to face challenges in managing health data, maintaining sufficient personnel, and providing HIM training pathways.

To respond to these needs, Bataan Peninsula State University (BPSU)-a public university in Central Luzon-undertook a strategic initiative to establish a dedicated HIM department aligned with CHED requirements and national healthcare priorities. This initiative was carried out through a partnership with Korea's Myongji College, under the Korean Ministry of Education's Official Development Assistance (ODA) project. Unlike initiatives

such as the Hue University of Medicine and Pharmacy (HueUMP) case in Vietnam, which focused on upgrading existing health programs, the BPSU project involved building a new HIM department entirely from the ground up [11].

This paper aims to provide a case study of the establishment of HIM department at BPSU and the development of competency-based undergraduate curriculum. It describes the curriculum development process, faculty capacity building, and early implementation outcomes. Finally, it discussed the broader implications for scaling HIM education in the Philippines and similar LMIC contexts, where the need for digitally capable health professionals is urgent and growing.

Accordingly, this study aimed to examine: (1) how a stakeholder-informed, policy-aligned process was used to design a new undergraduate Health Information Management (HIM) program at a regional state university in the Philippines; and (2) how national and global digital health and workforce frameworks were operationalized into a competency-based curriculum responsive to local health system needs in a low- and middle-income country (LMIC) setting.

Literature review

The global expansion of digital health systems and the adoption of electronic health records have underscored the need for a skilled HIM workforce [1, 2, 20]. As health systems worldwide seek to optimize service delivery through data-driven decision-making, the role of HIM professionals has become indispensable [3]. WHO's Global Strategy on Human Resources for Health emphasizes not only the quantity but also the quality and distribution of health professionals, calling for transformative education strategies and alignment with population health needs [5]. Investment in HIM education yields high social and economic returns, with improved health outcomes, efficiency, and data-driven decision-making [7–10]. The economics of health professional education have been explored in various contexts, demonstrating that well-trained HIM professionals are essential for effective health system performance goals [9, 10].

Despite these global trends, the Philippines continues to face significant challenges in developing its HIM workforce development [13, 14, 21–23]. The implementation of the national policies-such as the eHealth Strategic Framework and CHED's curriculum standards for HIM-has progressed slowly, particularly in rural and underserved areas [14, 16, 17]. Studies have found that only a minority of health facilities in the Philippines have fully functional health information systems, and many health workers lack formal training in data management, privacy, and health informatics. These challenges are compounded by limited faculty expertise and insufficient

practicum opportunities in academic institutions [15, 24]. Many health science programs in the Philippines lack instructors with formal training in digital health, resulting in a mismatch between curriculum content and evolving workforce needs. Similar capacity and implementation gaps have been observed across low- and middle-income countries in the Pacific, where health systems face constraints in digital infrastructure, faculty development, and phased rollout of eHealth strategies [25].

Regional experiences in Southeast Asia highlight how international partnerships and education reform can address similar gaps. For example, Vietnam and Thailand have launched capacity-building initiatives focused on health informatics education and curriculum modernization [11–13]. Vietnam's experience, in particular, illustrates the value of integrating context-specific curriculum and international collaboration into undergraduate health programs [11].

Comparative models from other LMICs offer further insights. For example, Ghana developed a new Bachelor's Degree Program in Health Information Management at the University of Cape Coast, using a curriculum benchmarked against both local needs and international standards, and incorporating problem-based and hands-on learning [26]. Nigeria's Bachelor of Health Information Management curriculum was revised to include core courses such as health informatics, electronic health records, and health data analytics, reflecting both national priorities and global HIM competencies [27]. In Ethiopia, a national task force led a systematic curriculum development process for undergraduate public health programs, emphasizing stakeholder engagement and alignment with WHO guidelines [28]. In Bangladesh, the development of an undergraduate health informatics curriculum involved collaboration with international partners and iterative piloting to address local workforce needs [28]. A review of health informatics education in developing countries highlighted the importance of adapting curricula to local contexts, as most existing programs were modeled after those in industrialized nations and did not fully address resource constraints or workforce realities [29].

Effective pedagogical approaches such as case-based and project-based learning have proven beneficial in equipping students with practical informatics competencies in resource-limited settings [11, 30–32]. Additionally, capacity-building efforts in countries like Vietnam and other LMICs have shown that partnerships with global institutions can accelerate both curriculum development and faculty training [9, 11].

Collectively, these experiences underscore the critical importance of institutional ownership, regulatory alignment, and sustained investment in faculty and infrastructure development. These factors are essential to

establishing robust HIM program that are both globally informed and locally responsive [3, 5, 11, 12].

Methods

Study design

This study employed a qualitative case study design to examine the establishment of an undergraduate HIM program at a regional state university in the Philippines.

Setting

The research was conducted at BPSU, a state public university located in Bataan Province, in collaboration with Myongji College under an ODA project from the Korean Ministry of Education. The study covered the program's planning and development phases from 2022 to 2024.

Data collection

To ensure triangulation and validity, data were collected from multiple qualitative sources:

- Document analysis: Review of national and institutional policy documents including CHED guidelines [16, 17], Department of Health (DOH) frameworks [8, 14], BPSU strategic plans, meeting minutes, and curriculum drafts.
- Stakeholder engagement: Semi-structured interviews and focus group discussions were conducted with key stakeholders, including university administrators, faculty, local government officials, health sector employers, and students. A total of 24 participants were purposively selected based on their relevance to HIM program development and engagement in health service delivery in Bataan. Sampling employed purposive and snowball techniques to ensure diverse perspectives across policy, education and frontline practice.
- Needs assessment: Local health workforce data, health service delivery reports, and community needs assessments were analyzed to identify gaps and inform curriculum priorities [19].
- Benchmarking: Comparative analysis of international HIM programs and curriculum mapping against national and global standards, including those from CHED, WHO, and Korea [5, 16, 17, 33].
- Survey instrument: The survey instruments used in this study was developed specifically for the HIM curriculum development project at BPSU under the "Enhancing Health Information Management Education Capacity" ODA initiative. It included demographic questions, baseline perceptions of the HIM project, and preferences for curriculum pathways, content, and delivery modes. Items were rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The instrument also

included an informed consent statement explaining the purpose of the survey, voluntary nature of participation, and confidentiality measures (see Supplementary File 1 for the English version).

Curriculum development process

The curriculum was developed using a participatory and iterative approach:

- Stakeholder workshops: Collaborative workshops were held to define program goals, core

competencies, and course content, drawing on best practices in curriculum mapping and capacity development [3, 4, 33].

- Expert consultation: Input was sought from health informatics and HIM experts in both the Philippines and Korea.
- Curriculum mapping: The draft curriculum was systematically mapped against national (CHED) and international benchmarks (e.g., WHO, United States, South Korea) to ensure alignment with workforce needs and educational standards [3, 20, 34, 35].

Table 1 Stakeholder consultation matrix for BPSU HIM program development

Stakeholder	Role/Institution	Meeting Date	Key Inputs	Implementation Status
Dr. A (Public Health)	DOH Representative	2024–03–15	Emphasized need for interoperability standards across RHUs	Incorporated into EMR system design
Ms. B (IT)	DOST Technical Advisor	2024–04–02	Recommended use of open-source EMR systems	Adopted in Phase 1 pilot rollout
Mr. C (Community)	Barangay Health Worker	2024–04–20	Requested multilingual EMR interfaces (Tagalog, Cebuano)	Language modules integrated
Mayor D	LGU Executive (Municipality)	2024–04–25	Highlighted challenges in healthcare worker retention	Incentive proposals documented
Nurse E	RHU Frontline Staff	2024–05–03	Reported RHU equipment and diagnostics shortage	Included in infrastructure investment plan
Ms. F (NGO)	Local Development Partner	2024–05–10	Advocated for community health promotion board activation	Support mechanisms incorporated

The table presents selected stakeholder inputs and is not an exhaustive list of all participants

Abbreviations DOH Department of Health, DOST Department of Science and Technology, EMR Electronic Medical Records, RHU Rural Health Unit, NGO Non-Governmental Organization

Data analysis

Qualitative data from interviews and focus groups discussions were analyzed using thematic analysis, following Braun and Clarke's reflexive thematic analysis framework. An iterative coding process was employed, combining inductive coding with framework-informed analysis guided by national health workforce priorities and global digital health competency frameworks [36, 37]. Data from document analysis and curriculum benchmarking were triangulated with interview finding to enhance analytical rigor. Themes were developed and refined through repeated comparison across data sources and ongoing analytic discussions within the research team.

The analysis was conducted by members of the core research team with disciplinary backgrounds in public health, health information management, and medical education. Reflexivity was addressed through regular analytic debriefings, during which researchers critically reflected on their positionality as program developers and examined how this positioning may have influenced data interpretation. To enhance credibility, interpretations were cross-checked across team members and data sources. Data saturation was considered achieved when no new themes relevant to curriculum design, workforce alignment, or implementation challenges emerged from subsequent interviews and document reviews.

Results

Stakeholder needs and situational analysis

Analysis of stakeholder consultations conducted between March and May 2024 identified several system-level priorities that directly informed the design of the BPSU HIM program. A total of 24 participants – including representatives from the DOH, local government units (LGUs), development partners, healthcare workers, IT specialists, and community members – contributed insights through semi-structured interviews and focus group discussions. Selected stakeholder inputs are summarized in Table 1 (Stakeholder Engagement Matrix), and stakeholder positioning was further analyzed using a power-interest mapping framework (Fig. 1).

Workforce shortages and retention instability

A recurring theme across the discussions is the shortage of healthcare workers, particularly in remote and underserved municipalities. Although provincial efforts to improve staffing were acknowledged, participants emphasized persistent gaps in the availability of doctors, nurses, midwives, and laboratory personnel. Recruitment challenges were frequently mentioned; however, retention was described as a more critical issue. Stakeholders reported that health professionals often migrated to urban centers or overseas employment, resulting in discontinuity of care and increased administrative strain on remaining personnel.

To address this, participants proposed strengthened incentive mechanisms, including financial incentives, professional development opportunities, and improved living and working conditions for rural health workers [5, 38]. These discussions highlighted that workforce instability affects not only service delivery but also the continuity and quality of health information management practices.

Financing gaps and governance fragmentation

Financial sustainability under the Province-Wide Health System (P/WHs) transition was identified as another major concern. Local health leaders noted that current budgets were insufficient to ensure facility readiness for PhilHealth Konsulta implementation. Medicines, diagnostic tools, and laboratory services were reported to be inadequate in several municipalities.

A specific concern raised by multiple stakeholders was the discrepancy between the actual cost of Konsulta services and the reimbursement rate from PhilHealth, which

currently stands at ₱500 per patient. Participants advocated for approval of a proposed increase to ₱1,700 per patient, alongside pooled financing arrangements across LGUs to stabilize service delivery [7]. These financing-gaps were perceived as constraining investments in digital systems and data management infrastructure.

Governance fragmentation across Bataan’s cities and municipalities further complicated system coordination. Despite alignment efforts under UHC, many LGUs were described as operating independently, leading to duplication of services, inefficiencies in referral pathways, and limited data interoperability [8]. Stakeholders emphasized the need for formal inter-LGU agreements, such as Memoranda of Agreement (MOAs), to harmonize planning, resource allocation, and information-sharing mechanisms.

Infrastructure limitations and digital system readiness

Infrastructure readiness was also widely discussed. Several participants reported under-equipped Rural Health Units (RHUs), limited diagnostic capacity, and insufficient access to laboratories, imaging services, and essential supplies in some barangays [39]. To mitigate these gaps, stakeholders recommended investments in both permanent infrastructure and mobile outreach solutions. The “Mariveles Medical Mission” was cited as an example of a successful outreach initiative that could be scaled across municipalities.

Stakeholders also reflected on lessons from the COVID-19 pandemic. Bataan’s rapid deployment of isolation centers, high vaccination coverage, and digital patient tracking systems were viewed positively. However, participants emphasized that many of these digital

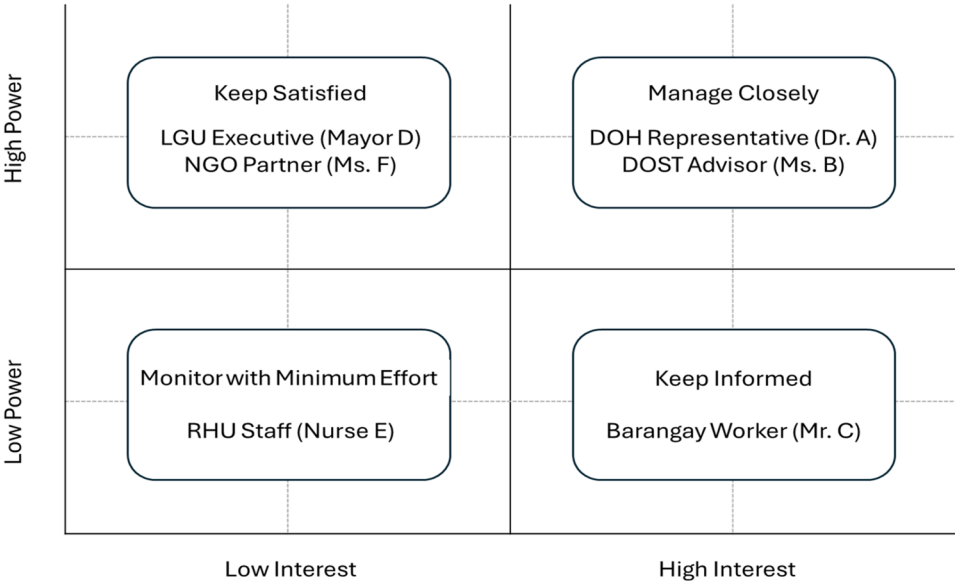


Fig. 1 Stakeholder power-interest Grid for BPSU HIM department

improvements had not yet been fully institutionalized [11, 40]. Mental health services were described as under-resourced, and the expansion of the Mariveles Mental Wellness and General Hospital was identified as a priority for strengthening long-term system resilience.

Community health promotion and preventive care coordination

Consultations underscored fragmentation in community health promotion activities. While the Provincial Health Promotion Board had been established, corresponding boards at city and municipal levels were not consistently activated. Health promotion initiatives—including anti-smoking campaigns, school-based nutrition programs, and wellness events such as the “Hataw Takbo Bataan” campaign—were described as lacking coordinated monitoring and sustainable funding mechanisms [13].

Stakeholders also reiterated the importance of addressing communicable and non-communicable diseases, including tuberculosis, HIV, dengue, and malnutrition, particularly in marginalized and indigenous communities [21]. Although provincial stunting rates were comparatively lower than national averages, localized food insecurity remained a concern in specific zones.

Collectively, these findings indicate that HIM curriculum development needed to extend beyond technical data competencies to incorporate workforce sustainability awareness, governance coordination, infrastructure adaptation, and system resilience within a decentralized health environment. These priorities provided the contextual foundation for the establishment and design of the BPSU HIM department.

Department establishment process

Analysis of institutional documents and stakeholder interviews indicates that the establishment of the HIM

Department at BPSU followed a phased and governance-oriented approach aligned with national digital health priorities [14]. The process was characterized by structured leadership endorsement, cross-disciplinary coordination, and adaptive resource mobilization.

The establishment process began with consultations, needs assessments, and strategic planning sessions involving university leadership, faculty members, and external project partners. Endorsement from the University Board and the College of Allied Health Sciences (CAHS) formalized institutional commitment and authorized the formation of a HIM Technical Working Group (TWG), and the phased establishment process is illustrated in Fig. 2.

The TWG was composed of experts in health sciences, information technology, and public health. Subcommittees were organized around curriculum design, faculty development, resource planning, and academic policy drafting. This cross-functional structure facilitated role clarity and coordinated decision-making throughout program development. The governance structure reflected centralized coordination principles similar to those observed in enterprise health information exchange systems, where distributed functions are streamlined through unified oversight and defined responsibilities [20]. In addition, stakeholder engagement approaches commonly applied in Philippine development cooperation informed consensus-building processes [34].

Strategic partnerships further strengthened the program’s contextual relevance. BPSU engaged with public and private healthcare service providers, LGUs, the DOH, and NGOs to inform labor market alignment, data governance considerations, and the integration of field training components. Interview data suggest that early involvement of external stakeholders contributed

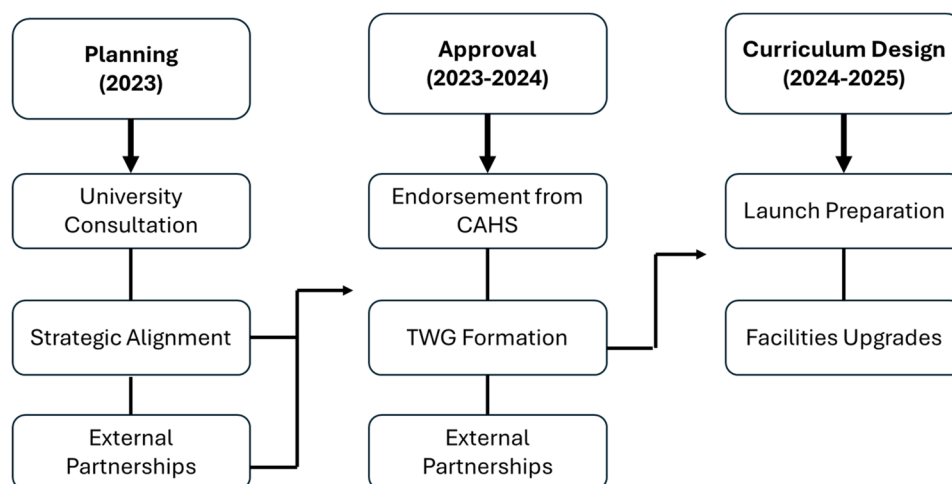


Fig. 2 Phased and cross-functional establishment process of the BPSU HIM Department, illustrating planning, institutional approval, and curriculum design stages from 2023 to 2025

to smoother program rollout and increased institutional legitimacy.

During the initial implementation phase, BPSU adopted a resource-efficient model by repurposing existing CAHS infrastructure. Classrooms, laboratories, and office spaces were repurposed and upgraded to meet the academic and practical training requirements. This phased investment approach enabled the program to launch in 2024 while allowing gradual faculty recruitment and technological upgrades to proceed concurrently.

Overall, these findings indicate that institutional alignment, structured governance, and adaptive infrastructure planning were central enabling mechanisms in the department’s establishment. Interview data further indicated that stakeholders perceived the establishment process as strengthening institutional ownership and cross-sector collaboration. For example, one local health administrator noted that “the early involvement of LGUs and health facilities increased confidence in the program’s relevance to workforce needs.

Curriculum development

Analysis of curriculum documents, benchmarking materials, and stakeholder consultations indicates that the development of the Bachelor of Science in Health Information Management (BSHIM) curriculum was guided by structured alignment with national directives, global digital health standards, and locally workforce needs.

BPSU adopted the ADDIE model (Analyze, Design, Develop, Implement, Evaluate) as the primary instructional framework for curriculum development [18] and the curriculum development framework is illustrated in Fig. 3. The design process aligned with policies of the Commission on Higher Education (CHED), incorporated principles from WHO digital health frameworks, and reflected strategic goals from the DOH under the

Philippine eHealth Strategic Framework [5, 14]. Benchmarking against international HIM training models, including the Texas Health Resources program, informed course structure, learning outcomes, and assessment indicators [20].

The structured development process translated workforce competency gaps into measurable educational outcomes. Core competency domains identified through stakeholder consultations included information governance, health analytics, data privacy, digital documentation standards, and decision-making based on accurate and timely health information [5, 16, 17]. These competencies were embedded across foundational and advanced courses.

The program was structured with a comprehensive mix of core and elective courses [15, 41]. Core subjects include health information systems, medical terminology, data privacy, health informatics, biostatistics, and public health. Electives provide opportunities for specialization in areas such as telehealth, epidemiology, and healthcare analytics, enabling flexibility in workforce positioning.

The inclusion of a two-year exit pathway leading to an Associate of Science in Health Information Management (ASHIM) reflects responsiveness to immediate labor market needs. This pathway allows students to complete foundational technical training and enter the workforce as entry-level health information professionals [42]. The associate curriculum culminated in applied outputs, including health records audits and database development projects, reinforcing workforce readiness.

Experiential learning was identified as a critical design feature. Students participate in internships, laboratory simulations, and community-based fieldwork in collaboration with local health units [43]. These applied components were designed to strengthen technical proficiency

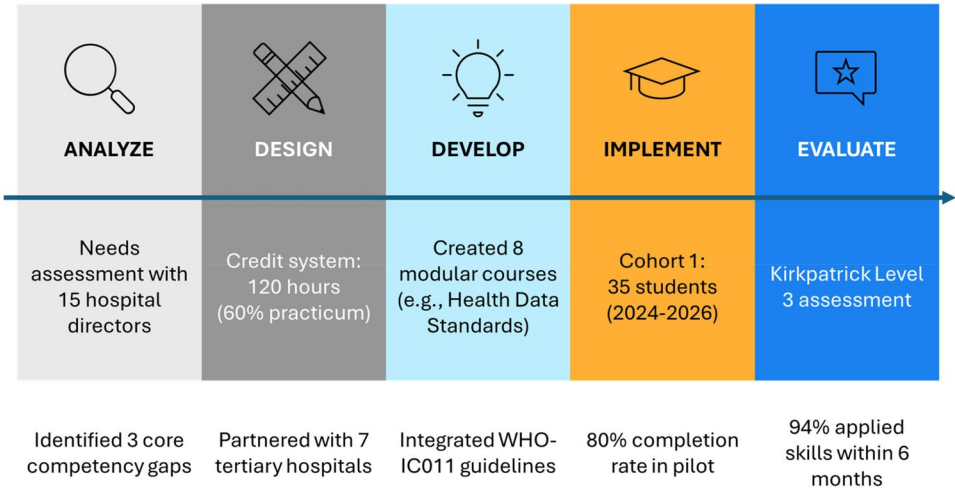


Fig. 3 ADDIE curriculum development model for BSHIM program

while fostering community engagement and service responsiveness.

From the outset, curriculum development was informed by consultations with healthcare providers to ensure alignment with rural and underserved contexts [44]. These collaborative engagements supported iterative curriculum refinement and emphasized employability, social accountability, and adaptability to evolving healthcare demands [3, 44]. Stakeholder consultations also highlighted the importance of integrating technical informatics competencies with broader public health perspectives. Participants emphasized that HIM graduates should not only manage health data but also support evidence-informed decision-making within local health systems. These insights informed the inclusion of applied courses and field-based learning components within the curriculum.

Collectively, these findings indicate that the curriculum development was shaped not only by regulatory compliance but also by competency-based translation of workforce needs into an applied and context-responsive educational framework.

Pilot implementation and evaluation

Findings from the pilot implementation phase indicate early evidence of operational efficiency gains, stakeholder engagement, and curriculum-to-practice integration.

As part of the initial rollout, BPSU conducted a series of pilot activities aligned with the Philippines’ UHC goals, particularly in support of PhilHealth reforms and digital transformation at the primary care level [7, 14]. These activities included project team training, stakeholder outreach, and field-based curriculum application. Project staff received technical training in digital health information systems, patient data handling, coding, privacy compliance, and workflow standardization. Concurrently, capacity-building sessions were delivered to community health workers, RHU staff, and administrative personnel, emphasizing ethical data management and improved PhilHealth documentation practices [7].

In selected pilot sites, structured HIM training contributed to measurable workflow improvements. Administrative records from participating RHUs indicated that

average PhilHealth claims processing time decreased from 40 to 19 days during the pilot implementation period. To assess early implementation outcomes, pilot monitoring indicators were collected during the deployment phase. These indicators were derived from routine program monitoring activities conducted across participating field sites. Data sources included training participation records, system usage tracking across participating RHUs, and documentation audits of health information records during the pilot phase.

As shown in Table 2, the program exceeded its participant satisfaction target (91% vs. 85%), based on feedback collected from training participants during the pilot implementation phase, and achieved a data accuracy rate of 97%, which translated to a 22% reduction in claim rejection rates.

Although the system adoption rate was slightly below target (65% compared to 70%), responsive adaptations—including the deployment of on-site technical support—mitigated implementation gaps. Field site engagement also exceeded expectations, with participation expanding to 13 RHUs and facilities, surpassing the initial target of 10 sites.

Qualitative feedback further contextualized these quantitative indicators. Students reported improved confidence in real-world health data handling, and faculty observed increased academic engagement linked to experiential learning components. Stakeholders highlighted improvements in workflow efficiency, especially in patient information documentation and data reporting processes.

However, several challenges were identified. Variability in baseline digital literacy among partner stakeholders required adaptive training approaches, and limited internet connectivity in certain rural areas constrained consistent system usage [11]. Scheduling conflicts and logistical constraints were also noted as barriers to full participation.

In response to these lessons, BPSU proposed a hybrid HIM governance model combining centralized university-level quality oversight with decentralized field training hubs located within LGU partner facilities [20]. This structure was designed to balance standardization with contextual flexibility. To support long-term sustainability, a five-year scale-up roadmap was developed (Table 3), outlining phased geographic expansion, policy integration milestones, and diversified funding sources—including government grants, LGU co-investment, and partnerships with international organizations [5, 25].

Overall, the findings indicate that HIM curriculum development addressed not only technical data competencies but also broader system-level considerations, including workforce sustainability, governance

Table 2 Pilot metrics dashboard

Metric	Target	Actual	Outcome
Participant Satisfaction	85%	91%	Extended practicum hours
System Adoption Rate	70%	65%	Added on-site tech support
Data Accuracy	95%	97%	Reduced claim rejection by 22%
Field Site Engagement	10 sites	13 sites	Expanded LGU training partnerships

Abbreviations LGU Local Government Unit

Table 3 Sustainability and scale-up roadmap

Year	Milestone	Funding Source
2025	Expansion to 5 additional LGUs	Internal BPSU budget, LGU MOAs
2026	Province-wide rollout across Bataan	DOH and DOST innovation grants
2027	CHED designation and HIM Center of Excellence	National Higher Education funding
2028	Launch of graduate HIM certificate programs	Co-funding from hospital partners/industry
2029	Integration with national digital health workforce registry	ADB, WHO

Abbreviations LGU Local Government Unit, MOA Memorandum of Agreement, BPSU Bataan Peninsula State University, DOH Department of Health, DOST Department of Science and Technology, CHED Commission on Higher Education, HIM Health Information Management, ADB Asian Development Bank, WHO World Health Organization

coordination, infrastructure adaptation, and health system resilience within a decentralized environment.

Discussion

This study examined the development, implementation, and early outcomes of a community-informed Health Information Management program established within a regional state university in the Philippines. The findings indicate that curriculum development grounded in stakeholder consultation, regulatory alignment, and structured institutional governance can translate national digital health priorities into locally responsive educational programs.

A defining feature of the BPSU model is its integration of community engagement within academic design. Rather than adopting a purely top-down curricular structure, the program incorporated inputs from public health institutions, local governments, NGOs, and private healthcare providers throughout development and early implementation phases [28]. This multi-sectoral engagement appears to strengthen alignment between educational outcomes and workforce demands, reinforcing the role of HIM professionals as both technical specialists and system-level contributors.

In comparison with regional and international HIM programs, the BPSU model demonstrates a distinctive emphasis on decentralization and social accountability. Many HIM programs in North America and Europe prioritize institutional accreditation and technical specialization in electronic health records [1, 45], whereas in Southeast Asia, HIM education often remains concentrated in urban academic centers [15]. The BPSU approach expands access to HIM education within a regional state university context while maintaining alignment with CHED standards [16–18] and global frameworks such as the WHO’s Health Metrics Network [46]. These features suggest that decentralized HIM training

may be feasible in underserved settings when supported by structured governance and stakeholder partnerships.

Despite these strengths, early implementation revealed several constraints. Infrastructure limitations, particularly inconsistent digital connectivity in remote campuses, posed operational challenges [15]. Faculty capacity was also constrained, as relatively few educators possessed combined expertise in health informatics and a background in community health. Additionally, regulatory processes associated with competency-based curriculum alignment created delays [16, 17]. These barriers are consistent with findings from other low- and middle-income country (LMIC) contexts, where digital health adoption is frequently constrained by workforce capacity gaps and institutional limitations [35].

The experience of BPSU underscores several key considerations. First, curriculum innovation must be accompanied by parallel investments in faculty development and technological infrastructure [3, 33]. Second, stakeholder engagement is not only beneficial but necessary for ensuring contextual relevance in decentralized systems. Third, alignment with national regulatory bodies requires proactive coordination to avoid delays in curricular updates.

In response to implementation challenges, BPSU adopted pragmatic mitigation strategies. Engagement of part-time professionals from local hospitals, partnerships with development agencies, and phased infrastructure retrofitting reflected adaptive capacity-building approaches similar to those observed in other LMIC education reforms [11, 33]. The introduction of blended learning modalities and iterative stakeholder consultations helped sustain program continuity despite regulatory and infrastructural constraints.

Several enabling factors appear to have contributed to early program outcomes. Institutional ownership within BPSU supported continuity and internal investment [9]. Alignment with CHED frameworks provided academic legitimacy [16, 17], while international development assistance facilitated early-stage technical and financial support {WHO, 2018 #18;WHO, 2021 #35}. These elements highlight the importance of multi-level support structures in emerging digital health education initiatives.

Limitations

This study has several limitations. As a single-institution case study, the findings may not be fully generalizable to other regions or national contexts. Some participants were directly involved in program development, which may have introduced social desirability bias. Additionally, pilot metrics reflect short-term implementation outcomes; long-term workforce integration and measurable health system improvements require longitudinal

evaluation. Future research should assess graduate employment trajectories and system-level impacts associated with expanded HIM workforce capacity.

Conclusion and recommendations

The establishment of the HIM Department at BPSU represents an important development within the Philippines' broader efforts toward health system strengthening and digital transformation. Positioned at the intersection of education, public health, and technology, the HIM Department responds not only to the growing need for skilled health information professionals while advancing regional capacity aligned with national priorities.

Developed in response to dual challenges – the increasing need for workforce-ready HIM professionals and the persistent gaps in health data quality and utilization – the program is strategically positioned in Central Luzon, where both urban centers and underserved communities coexist. This setting allows BPSU to produce graduates who are technically competent while remaining responsive to local health system realities.

At the local level, the HIM Department has the potential to strengthen provincial and municipal health offices through graduates and interns who support data management, records digitization, and reporting functions. Such contributions may support improvements in disease surveillance, maternal and child health monitoring, and immunization tracking, particularly in areas where paper-based systems remain prevalent.

At the national level, the BPSU HIM initiative aligns with the Department of Health's National eHealth Strategic Framework and contributes to ongoing efforts toward the decentralization and digital integration of healthcare systems. By offering an outcomes-based, competency-driven curriculum, the program also aligns with the CHED strategic goals for health professional education.

To sustain and extend the program's impact, several strategic directions warrant consideration. Continued institutional commitment and stable funding will be essential for faculty development, research expansion, and infrastructure modernization. Strengthened coordination with CHED and national regulatory bodies any further support formal recognition and standardization of HIM education across state universities and colleges. Sustained multi-sectoral partnerships – including collaboration with LGU's, DOH, NGOs, and international development agencies – can facilitate technical support and program refinement. Integration with evolving health information technology ecosystems will also be critical to maintaining workforce relevance.

Future research should rigorously evaluate long-term workforce integration and system-level outcomes associated with HIM training. Additional studies examining curriculum alignment with emerging digital health

technologies, digital inclusion in geographically isolated areas, and data governance competencies would further strengthen the evidence based for HIM education reform.

In conclusion, the BPSU HIM initiative illustrates how regional academic institutions can contribute meaningfully to digital health workforce development within decentralized systems. While continued evaluation and policy coordination are necessary, the experience offers a context-informed model that may guide similar efforts in other underserved settings.

Abbreviations

ADB	Asia Development Bank
ADDIE	Analyze, Design, Develop, Implement, Evaluate
ASHIM	Associate of Science in Health Information Management
BSHIM	Bachelor of Science in Health Information Management
BPSU	Bataan Peninsula State University
CAHS	College of Allied Health Sciences
CHED	Commission on Higher Education (Philippines)
COVID-19	Coronavirus Disease 2019
DOH	Department of Health (Philippines)
DOST	Department of Science and Technology
EMR	Electronic Medical Records
HIM	Health Information Management
HIV	Human Immunodeficiency Virus
HueUMP	Hue University of Medicine and Pharmacy
ICD-11	International Classification of Diseases, 11th Revision
KOICA	Korea International Cooperation Agency
LGU	Local Government Unit
LMICs	Low- and Middle-Income Countries
NGOs	Non-Governmental Organization
ODA	Official Development Assistance
RHUs	Rural Health Units
SUC	State Universities and Colleges
TWG	Technical Working Group
UHC	Universal Health Coverage
WHO	World Health Organization

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12909-026-09144-4>.

Supplementary Material 1.

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Authors' contributions

EM and SK conceived the study. EM, RC, and YL collected and analyzed the data. EM, YL, RC, SY, BJ, and SK contributed to curriculum mapping. EM, DR, and SK drafted and revised the manuscript. BJ and RC also reviewed the manuscript. All authors reviewed and approved the final manuscript *.

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Data availability

All data generated or analyzed during this study are included in this published article or available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study focused on curriculum development and educational program design and did not involve clinical interventions, patient data, or collection of sensitive personal health information. Data was collected through voluntary participation in interviews, focus groups, and surveys related to educational planning and workforce needs.

At the time of the study, formal ethics review was not typically required for institutional curriculum development research involving minimal risk and anonymized responses under Philippine research practice. All participants were informed about the purpose of the study, the voluntary nature of participation, and confidentiality measures prior to data collection. Written informed consent was obtained from all participants. All procedures were conducted in accordance with the ethical principles of the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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