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RESEARCH ARTICLE

A qualitative study on research ethics education approaches, learning, and practices in Rwanda: experiences from faculty and students

[version 1; peer review: 1 approved with reservations]

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Abstract

Background

Research ethics and ethical research practice are essential for protecting research participants. However, opportunities for practical ethics learning are often limited, making it difficult to apply ethical principles in real-world research. This study explored students' and faculty's experiences and perspectives on ethical research conduct and learning in Rwandan medical and health sciences education.

Methods

An exploratory qualitative design was employed, using in-depth interviews with nineteen students and seventeen faculty staff between March and September 2024 at a medical and health sciences college of the University of Rwanda. Data were analysed and three themes were developed using reflexive thematic analysis: research ethics learning context, superficial understanding of research ethics concepts and principles, and barriers to translating knowledge of research ethics into practice. The constructivist and phenomenological frameworks were used to interpret the findings.

Results

While students recognized the importance of research ethics, their learning experiences were fragmented, procedural, and often

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burdensome. Challenges included overcrowded classes, inconsistent guidance, limited exposure to ethics materials, and lecturers' lack of confidence in teaching ethics. Institutional inefficiencies, financial constraints, and pressures to meet academic timelines further hindered students' preparedness for ethical research. In practice, students navigated complex situations, including populations unfamiliar with their rights, students and community expectations, and misunderstandings related to compensation for research participants, which complicated consent and blurred ethical boundaries.

Conclusions

The findings suggest that meaningful ethics learning occurs when ethical reasoning is embedded in day-to-day research practice and supported by mentorship, dialogue, and opportunities for real-world research engagement. Considering these results, the University of Rwanda can strengthen supervision, streamline review, ethical approval and ethical follow-up processes, and foster an environment that rewards ethical reflection. Aligning ethics education with students lived realities and experiences, and the structural constraints identified can help develop reflective, resilient practitioners equipped to navigate the complex ethical demands.

Keywords
Research ethics, ethics learning, ethics ecosystem, ethical research, Rwanda

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1. Introduction

Research ethics education is a cornerstone for fostering responsible and competent researchers, particularly in the health sciences (Antes, 2014; Millum & Sina, 2014). It nurtures critical judgment, values, reflective reasoning, and the ability to adapt principles within diverse and complex research contexts (Antes, 2014). There is a growing demand for ethical preparedness among researchers as health research; including clinical trials, epidemiologic surveillance expands and intensifies across low- and middle-income countries (LMICs) (Kiwanuka et al., 2024; Ndebele et al., 2014). In some African countries, capacity-building initiatives such as the Fogarty African Bioethics Training Program (FABTP) have been implemented to train African professionals and strengthened institutional teaching capacity (Ali et al., 2012; Kiwanuka et al., 2024). Trainees experienced significant professional advancement post-training in various roles as instructors, leaders of ethics boards, and authors of ethics-related publications (Kass et al., 2016).

Despite growing consensus on the importance of research ethics education, there remains a significant gap between the ideals of ethics education and ethical research conduct. Studies across African contexts report that instruction is often partial, minimally engaging, or absent altogether (Hyder et al., 2013; Makola & Ntoyanto-Tyatyantsi, 2023a). In Cameroon, for-example, research shows that of 174 student theses on Human Immunodeficiency virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), ethics approval was documented in only 9.8%, and informed consent in 47.8%, with many students overlooking foundational ethical requirements entirely (Munung et al., 2012). This suggests that students may perceive ethics as peripheral, thus failing to develop the deeper capacity to navigate real-world ethical challenges such as consent in low-literacy environments or confidentiality in tightly knit communities (Turcotte-Tremblay & Mc Sween-Cadieux, 2018; Zulu et al., 2019). A similar trend was observed among health researchers whereby, although 103 (76.85%) out of 167 surveyed in 10 Cameroon regions had received some ethics training, such training often fell short in coverage and depth. It did, however, correlate with a more consistent submission of protocols for ethical review (Ateudjieu et al., 2022). Additionally, studies with early-career researchers in Kenya, Tanzania, and Uganda show that community engagement and locally grounded practice can strengthen ethical conduct with approaches that enables hands-on mentorship and supported fieldwork rather than lecture-based instruction alone (Joel L. Bargul et al., 2022).

Furthermore, despite some improvements in clinical trial oversight and pharmacovigilance, basic training for REC members; regulators still report lack of institutional capacities to prevent and manage research misconduct during clinical trials (Fimbo et al., 2024; Seralegne et al., 2023). Oftentimes, RECs are established and trained but lack sustainable funding, clearly defined procedures, and adequate staffing to impact long-lasting institutional improvements in research ethics systems (Chatfield et al., 2021; Deutsch-Feldman et al., 2020). Structural weaknesses contribute to review delays, inconsistent standards, diminished trust in the ethics process, violation of ethical approval procedures, informed consent breaches, and failure to report serious adverse events; highlighting gaps in research ethics practice in real-world research contexts (Ateudjieu et al., 2022; Kiwanuka et al., 2024; Ochieng et al., 2013).

The lack of or minimal context specific ethics curricula is increasing critique regarding the cultural relevance of research ethics education. Ethics curricula often lean on Western paradigms that privilege individual autonomy, which may conflict with community decision-making practices, power dynamics, gender hierarchies, and communication norms across African societies (Colom & Rohloff, 2018; Ogundiran, 2004; Zulu et al., 2019). The combined limited ethics training, lack of cultural relevance and sustainable systemic implementation contributes to a mismatch between academic theory and real-world complexities. This leaves students unprepared to engage ethically with participants in hierarchical, relational and culturally responsive contexts in many LMICs (Colom & Rohloff, 2018). Therefore, a need to incorporate ethics teaching within institutional priorities, investing in students and faculty training, strengthening oversight structures, and aligning pedagogy with local cultural and resource realities (Kass et al., 2016; Kiwanuka et al., 2024).

In Rwanda, where health research investment is growing (Murenzi et al., 2025); it creates both a challenge and an opportunity of investing in ethical research practice. Although Rwanda has strengthened its regulatory framework for research ethics, evidenced by the establishment and operationalization of the Rwanda National Ethics Committee, there remains a publication gap of how research ethics is learned and how ethical conduct of research is perceived in Rwanda. Undergraduate students at the University of Rwanda receive early exposure to research methods through modules and workshops on proposal writing, study design, data collection, and analysis. These lessons often remain largely theoretical until the senior years when a thesis is required and about 80% of undergraduates attend such courses, but many report gaps between classroom teaching and real-world application where majority participate in data collection, particularly in designing studies and interpreting published work (Habineza et al., 2019). Final-year undergraduates most commonly undertake retrospective, cross-sectional studies in tertiary hospitals, while postgraduate residents are expected to conduct prospective investigations to meet academic regulations (Mugabo et al., 2021). Broader national support for health education, health and clinical research training and other government-led initiatives to strengthen undergraduate and

postgraduate programs provide an enabling policy environment (Kakoma, 2016; Ministry of Health, Rwanda, 2024). Therefore, this study addresses the following research question: What are the experiences and perspectives of faculty and students regarding the teaching, learning, and practice of research ethics in Rwandan medical and health sciences education?

2. Methodology

2.1 Study design

This is an exploratory qualitative study that employs in-depth interviews (IDIs). An exploratory qualitative study design was chosen for this research, as it enabled in-depth exploration of students' perspectives and insights from department heads, deans and lecturers on research ethics education, learning and ethical research practices for medical and health sciences students. It facilitates an open-ended approach, enabling participants to express themselves on specific challenges and suggestions for improvement, to gather context-specific data in an under-researched area (Rendle et al., 2019).

2.2 Study settings

The study was conducted in Kigali, Rwanda's capital, at the College of Medicine and Health Sciences of the University of Rwanda (UR-CMHS). The college was purposefully selected as it is the only institution in the country that offers comprehensive undergraduate and postgraduate programs in Medicine and Health Sciences. Although other private universities have been established more recently, the UR-CMHS remains the primary institution offering a diverse range of undergraduate, master's, and PhD programs in health and medicine. Additionally, the college's selection was due to the ETHIMED project, which aims to build capacity in Research Ethics (RE) at the University of Oslo (UiO) and the University of Rwanda (UR). This collaboration guided the recruitment and sampling process whereby the departments or units with potential participants to the project trainings and other project activities made it easy to contact and approach them.

2.3 Study participants and recruitment

A maximum variation sampling strategy was used to capture various perspectives and patterns across groups of participants. We approached a total of 42, two participants declined to participate, four did not respond to the invitation and we interviewed 36 participants, including 7 heads of departments and deans with 6–20 years of academic experience, 8 postgraduate students, 11 undergraduate students, and 10 lecturers from all schools within the UR-CMHS. Students enrolled for less than one academic year were excluded. Lecturers, heads of departments, and deans who had not held the position for at least one full academic year were excluded. The students were aged 22–36 years, of whom 13 (68.4%) were female. Faculty participants were aged 30–56 years, with 10 (58.8%) female and 9 (52.9%) holding a PhD. Faculty reported an average of 12.5 years of academic experience, and the lecturers had an average of 4.3 years of experience in teaching research methodology or other research-related courses.

The interviews were conducted at the College of Medicine and Health Sciences in Kigali, Rwanda, between March and September 2024. The multi-perspective nature of this study's included deans/heads of departments, lecturers, and students was appropriate to study research ethics education across multiple levels of the academic system. These groups of participants play interconnected roles to ensure the success of education. Institutional leadership shapes priorities of what, when and to who is taught, lecturers participate in curriculum design and delivery, and students experience and apply research ethics in real world research setting. Evaluating perspectives across these groups enabled a comprehensive understanding of how research ethics is taught, learned, and practiced, and allowed for the identification of consistencies, gaps and challenges between institutional intentions, teaching practices, and student experiences.

2.4 Data generation

In-depth interviews (IDIs) provide researchers with a deeper understanding of individuals' perspectives, feelings, and experiences in a specific area of interest, which can inform future studies (B. Rutledge & C. Hogg, 2020). Interview guides facilitated structured data collection. Interviews were audio recorded, while non-verbal data were documented in field notes by the interviewer. The IDIs with undergraduate and postgraduate students were complemented by interviews with department heads, deans, and lecturers to explore faculties and students' experiences and perspectives on ethical research education, learning, and practices in Rwandan medical and health sciences education.

The study used three semi-structured interview guides tailored to participants' roles: (1) deans and heads of departments, (2) course coordinators/lecturers, and (3) undergraduate and postgraduate students. All guides began with a common opening question on participants' understanding of research ethics. The guide for deans and heads of departments was based on the institutional approaches, policy-level opportunities, and strategic priorities in health sciences training. The guide for course coordinators and lecturers focused on curriculum design, teaching methods, assessment practices, and

implementation challenges. The student guide explored learning experiences, perceived effectiveness of training, and the application of ethical principles. Across all guides, the main topic blocks included: (a) conceptual understanding of research ethics, (b) current teaching or learning practices, (c) experiences and application, (d) gaps and challenges, and (e) recommendations for improvement.

The interview guides were drafted by the first author, then reviewed, revised and finalised by consensus of the co-authors. The first author was the main interviewer during the data collection process. As a PhD candidate and former visiting lecturer at the University of Rwanda, the first author was uniquely positioned to conduct the interviews, as his familiarity with the academic environment enabled him to engage with participants.

The interviews lasted for an average of 50 minutes. This duration allowed for in-depth conversations while keeping the interviews concise and focused on the research objectives. Interviews with department heads and deans were conducted in their offices at a mutually agreed-upon time. For the students, interviews took place in the office of an assistant lecturer on leave or in another safe office of the first author. The offices provided a quiet, private space, ensuring participants' comfort and minimizing potential distractions during the interviews. Conducting the interviews on the College of Medicine and Health Sciences campus was a practical choice, as it facilitated easy and timely access to the student participants. The interviews were conducted in English, the primary language of instruction at the College of Medicine and Health Sciences. Data collection continued until the research team judged that the dataset provided sufficient depth and diverse meanings to address the research aims. Decisions about when to stop collecting data were guided by an ongoing, reflexive assessment of information richness whereby the dataset was judged to have offered ample information to support a meaningful and interpretative analysis (Braun & Clarke, 2021).

Audio recordings were transcribed verbatim by a trained research assistant, who reviewed each transcript for completeness before sharing them with the first author. The first author then engaged in repeated reading, note-taking, and reflection to develop familiarity with the dataset. Transcripts were organised in NVivo 14 to assist with data management and retrieval.

The data analysis followed qualitative reflexive thematic analysis based on Braun and Clarke's framework (Braun & Clarke, 2006, 2020). Braun and Clarke's six recursive phases of familiarisation, coding, developing initial themes, reviewing, refining and naming themes, and writing up was undertaken as an iterative and interpretative process (Braun & Clarke, 2006). The first author generated codes that captured features of the data relevant to the research questions and progressively developed these into potential themes representing patterned meaning across the dataset.

The developments of themes and interpretations were discussed on an ongoing basis, reflexively among co-authors to enrich understanding and explore alternative perspectives and meanings. Themes were refined and defined to capture their conceptual essence, and the story was conveyed across the dataset. Interpretation was grounded in social constructivist and phenomenological perspectives, recognising meaning as co-created through participants' lived experiences and the researchers' interpretive engagement (Adams, 2006; Jonathan A. Smith et al., 2021; Stubblefield & Murray, 2002). Analytic decisions and reflexive insights were documented throughout to ensure transparency, coherence, and depth, consistent with Braun and Clarke's reflexive approach (Braun & Clarke, 2025).

2.5 Ethical considerations

Ethical approval and renewal (No. 424/CMHS-IRB/2022 and No. 362/CMHS-IRB/2024) were obtained from the Institutional Review Board (IRB) of the College of Medicine and Health Sciences, University of Rwanda. Additionally, NSD approval number 125830 was obtained All participants voluntarily signed informed consent forms after being fully briefed on the study's purpose, objectives, benefits, risks, privacy, confidentiality, voluntary participation, and withdrawal from the study, with no implications. A unique identification number was assigned to each participant to protect their privacy and maintain their anonymity. Privacy and confidentiality were maintained throughout the data collection, storage, and analysis processes.

2.6 Trustworthiness of the study

To ensure the study's trustworthiness, the key principles of credibility, transferability, dependability, and confirmability were utilised. We engaged participants, including undergraduate and postgraduate students from various schools, deans and heads of departments, and faculty members teaching courses in research methodology, epidemiology, and statistics, to promote data triangulation and provide a broad representation of perspectives. Structured guides were employed to ensure clear, impartial, and relevant data collection, contributing to the study's credibility. Comprehensive and detailed explanations were provided to enhance the transferability of the findings, ensuring that they could be applied to similar contexts. Field notes were taken to document the research process, allowing the first author to reflect on actions taken.

In my role as a PhD student and the primary researcher responsible for data collection and analysis, I engaged in reflexivity throughout the study to critically consider how my position could shape the research process and interpretation of the findings. Having previously studied at the data collection site as an undergraduate and later worked as a lecturer, while also maintaining ongoing research and capacity-building collaborations with academics in the same field and other health sciences areas, I remained attentive to how my past and current experiences could influence my interpretation of participants' accounts. While these prior connections provided contextual familiarity with the academic environment, I approached the study as an independent researcher interested in understanding and improving the quality of research training and research ethics practice within the university. I remained attentive to how my background, interests, and expectations could influence both the data collection, analysis and interpretation processes. To support reflexive practice, I revisited my assumptions during coding and interpretation and engaged in regular discussions with supervisors to critically reflect on emerging interpretations. This reflexive engagement helped improve my understanding of the data and encouraged to differentiate participants' accounts and my own observations of the research ethics practice by University of Rwanda students.

Findings

The participants are identified using anonymised alphanumeric codes to indicate their group affiliation while preserving confidentiality. The codes were constructed as follows: PS refers to postgraduate students, US to undergraduate students, CCL to course coordinators or lecturers, and DH to heads of departments and deans. Undergraduate and postgraduate students are collectively referred as students in the manuscript while deans, heads of departments, lecturers and course coordinators are collectively named faculty. The numerical component is an anonymous identifier assigned to each participant within their respective group (e.g., PS31070, US290050, CCL0005, DH00040).

Three themes were generated to capture participants' perspectives and experiences of faculty and students on research ethics education approaches, learning, and practices in Rwandan health sciences education. The themes include: (1) research ethics learning context, (2) Superficial understanding of research ethics concepts and principles (3) Barriers to translating knowledge of research ethics into practice. These themes build on one another, starting with research ethics education and learning context, which shape the understanding of ethical concepts and principles, teaching structure, delivery methods, and ultimately influencing the ability to apply the ethics principles in practice, where various challenges and barriers are encountered especially during real word research practice. Detailed sub-themes and illustrative quotes from participants further explain these findings.

Theme 1: Research ethics learning context

Participants highlighted that research ethics learning and education within their respective departments was often limited, fragmented, and secondary to broader research methodology instruction. Students reported minimal opportunities for engagement, reflection, and hands-on practice, while faculty acknowledged constraints in teaching time, expertise, and resources. This theme captures both the approaches used to teach research ethics and participants' reflections on how learning experiences could be enhanced to better prepare students for ethical research practice.

Subtheme 1.1: Research ethics pedagogy

Interviewed participants described research ethics educational experiences as fragmented, and insufficiently emphasized, leaving them underprepared to apply ethical principles in research. Ethics content was often brief and embedded within broader research methodology courses rather than treated as a substantive area of study.

Participants reported that the time devoted to research ethics was minimal, particularly in comparison to the emphasis placed on research methodology during proposal preparation and during submissions for ethical clearance as participants further elaborate;

> *"We had a course on research, but it didn't focus specifically on ethics … The emphasis was more on methodology as we were preparing to start our proposals, focusing on research designs"* (PS31070). *"It-research ethics - is a unit during research methodology. it is just a simple topic that we inform students few issues concerning research ethics. It's a course towards ensuring that they will be able to work on their research project for year 4 students. Maybe I can say that it's just a topic. During year 4, we also organise presentations of their proposals before they go on for applying for ethical clearance. This is when the whole department meets to give feedback to students.* (DH00020), and *"RE … This is a model that students are taught all matters concerning research such as epidemiology, biostatistics, research proposal among others"*- (DH00040). *"The module lasted one month, and*

the research [ethics training content] was two days" (PS00060). Another participant recalled attending sessions with *"more than seven hundred students in a large lecture hall with minimal opportunity for interaction"* (PS060030).

Postgraduate students further shared that online and self-directed delivery, which provided minimal opportunities for discussion and clarification, were the most common mode to obtain information on research ethics.

"It [research ethics learning] was an online course, and it was just reading some chapters with no instructors and no guidance" (PS30020). *"The module on research ethics was not very effective for me. The lecture was delivered online, and since the material was new to us, it was difficult to follow and ask questions … On-site teaching was more effective, but it only focused primarily on designs and methodologies"* (PS31070).

Faculty confirmed that research ethics was rarely addressed in depth, even at advanced levels, often limited to introductory principles:

"For PhD students or even masters, they might need to conduct clinical trials, but we teach nothing about regulatory processes and/or requirements" (DH0004).

Some programs offered seminars while others had modules in which students get introduced to ethics, but these were inconsistently implemented:

… on PhD students they have what we called seminars, there is particular seminar that focus on research ethics, it integrates all those components of ethical conduct, responsible conduct research …" (CCL0008). *"We start by teaching them theories about research methodology after that we do some practices where we teach them about a research project, ethical clearance/approval processes and consenting processes as well as other steps such as data analysis and results dissemination"*- (CCL0005).

"At diploma level, students are taught research under a module called health measurement and research. Students are introduced to ethical consideration matters as well. At bachelor level, we have a module on evidence-based project, where students conduct evidence-based practices including conducting research. We teach students formats of proposals, how to apply for permissions and ethical clearance among others. At master's level, we have what we call advanced research module where they study all of those ones including research project as a dissertation. It's a module with various topics on research proposal, ethical consideration, statistics and epidemiology as well" (DH00019).

Additionally, during research ethics learning process, a lack of sustained guidance, with supervision often inconsistent or inaccessible due to inadequate training in research ethics for instructors and lecturers. Supervision, when available, was often limited, inconsistent, or inaccessible, and the lack of timely guidance left students uncertain and unprepared to address ethical dimensions in their work. Participants acknowledged that supervisors have different levels of experience, which might have affected students' engagement with ethical research practice.

"Mostly, the supervisors that we [students] have are not available" (PS60030).

"*We completed it in the second year, but it felt limited due to time constraints … I believe the course should be offered annually throughout the program to reinforce understanding"* (PS33060).

"I wish every year they should put a topic of research so that people keep updating their knowledge" (PS30020).

Participants further expressed a lack of supervisors' preparation and consistency, which affected students' learning experiences, sharing receiving students whose supervisors lacked sufficient awareness of research ethics principles, supervision support, leaving students without meaningful guidance:

"Even supervisors … some of them are not aware of those principles … students come from different groups and the supervisor just tells them, 'Go and work,' without real support" (CCL0006).

"…. I think lecturers and supervisors need various training, particularly training on how to handle supervision, training on how to support students …"- (CCL0008).

Despite some faculty efforts to integrate ethics into proposal and thesis preparation, students continued to perceive ethics learning as abstract and insufficiently applied. These findings indicate that research ethics learning remains largely theoretical, fragmented, and inadequately supported.

Sub-theme 1.2: Research ethics teaching capacity and resources

Participants described multiple constraints that restricted the quality, continuity, and effectiveness of research ethics learning for both undergraduate and postgraduate programs. Faculty accounts, in particular, highlighted shortages in staffing, time, training, teaching materials, and coordination, all of which restricted meaningful engagement with research ethics content and follow-up with students during their learning process. These conditions weakened the depth, consistency, and reinforcement of research ethics learning, contributing to gaps that may later surface during students' research practice.

Faculty emphasized that insufficient trained staff/faculty and workload pressures reduced opportunities to teach ethics thoroughly and to mentor students effectively. Some participants explained that meaningful ethics teaching requires more time, trained staff, and institutional coordination, yet these were largely absent:

> *"… exposure to other institutions would help … staff are not enough … need senior staff or professors with PhDs to guide on teaching research ethics … curriculum review takes 5–10 years … integrating ethics fully takes a long time … challenges in classroom space and scheduling"* (CCL0005).

> *"We have several issues that affect the teaching. Time allocated for teaching research ethics is insufficient … increase teaching time or credits for the module … networking is limited … don't know how others are doing things"* (CCL0009).

> "*I think lecturers also need training, including how to supervise students because it's all about individual efforts because sometimes students go to present and as a lecturer you are ashamed because you also didn't have anything to offer to them, to point where you feel like you want to go to hide"* (DH00030).

Large class sizes and institutional pressures to increase student intake were also described as barriers to effective ethics learning and supervision due to overcrowding that reduced the ability to support students throughout their research process:

> *"There are too many students in our programs … this can also affect how we teach research ethics and integrity, including getting enough time to follow up students during their research projects to be able to check if they really follow RE/RI principles"* (CCL0001).

It was also found that, the financial constraints created pressures, especially when procedures are seen as inflexible or misaligned with available resources, students may begin to view ethical compliance as optional, bureaucratic, or a burden to be navigated rather than a foundational part of ethical research. Faculty also expressed that financial challenges affect their teaching work, consultation of other research work and enabling a research environment where they can easily guide students.

> *"…. getting the labs and financial resources needed to invite some patients who might be used during research but also organising simulated patients for instances in that case needs financial resources …"*- (CCL0008).

> *"… As I mentioned that we have a library, but it is still poor, they don't access all needed materials, so, given the online and even fiscal, what is needed here is research support"*- (CCL0003).

> *"Undergraduate students … they don't have funding to do research … that's why I doubt the compliance of data collection … they tend to have less data and manipulate them"*- (CCL0001).

> *"Challenge … experimental laboratory equipment is limited … students mainly do observational studies … financial support is lacking to conduct deeper experimental research. Additionally, access to journals and online resources is restricted; not all materials are open access, sometimes requiring payment"* – (CCL0005).

Sub-theme 1.3: Learning experience recommendations

Students and faculty emphasized the need for more applied strategies such as interdepartmental collaborations, case-based learning, peer engagements, real-life ethical scenarios, mentorship to enable bridging the gap between acquiring theoretical knowledge and practice during research. Across interviews, students and faculty acknowledged the importance of learning ethics and called for more interactive and practice-based ethics instruction, contrasting it with the largely theoretical or online formats they had experienced.

Participants advocated for

> *"physical class [es]"* and instruction from *"someone experienced … to teach students about the research ethics"* (PS30020) and emphasized *"hands-on training … such as on how you build the consent form, how you apply for ethical clearance"* (PS30060).

> *"Practical components are needed … students are still struggling … when they reach the field, they start wondering how to approach the community. Students are familiar with doing things in the same way; there is no exchange of ideas between departments or exposure to other methods"*- (CCL0005).

Locally contextualised guidelines were identified as a necessity in addition to also training the faculty to be able to guide students.

> *"It's not only for students but also lecturers, it is necessary to learn RI/RI because it's the only way to follow research ethics principles and know how to follow guidelines, it is also necessary to have local guidelines in order to ensure that they are context specific"* DH00030.

> *"For them<students>, they just want to finish the module, and there is this small part called research ethics that is included, so if they get to know that this is a serious issue, that does not end in classroom, but also are practical, we can take it seriously. And these trainers are the one who gives us marks in the field placement or in the thesis, so at least, they need to ask for evidence, like if one is presenting, they ask at least one signed consent, they need to know that it should be emphasized, it can help"*- (PS70040).

> *"We focus more on clinical practice than research. Research is only mandatory for those interested, and most of us prioritize clinical work. I haven't had much practical experience regarding research ethics yet"*- (PS31070).

> *"Students may unintentionally harm the community or give sensitive messages … learning ethics helps prevent conflicts between researchers and participants"*- (CCL0005).

Additionally, multimedia tools, guidelines accessibility and real-world case studies were also strongly recommended as tools that can impact how students learn. Students expressed that *"videos on cases that act as an example"* (PS70040) and illustrations of real challenges would foster stronger engagement and deeper ethical understanding. Small group formats were also suggested:

> *"When we are in a class of 10–20 students … the lecturer will easily remember us and engage us"* – (US00090); highlighting the perceived benefit of dialogue and peer learning impact on effective ethics of ethics learning to practice.

> *"There should be policy and guidelines depending on the department or the study level* [diploma, graduate or postgraduate*]"* – (PS30020).

> *"Students need to request ethical clearance … guided by supervisors … familiar with the process over time. Curricula should be aligned to national and international guidelines … but students still need guidance in practice"*- (CCL0005).

Theme 2: Superficial understanding of research ethics concepts and principles

Students were exposed to some research ethics concepts; however, many demonstrated a partial or superficial understanding, struggling to distinguish between related ethical terms and principles such as informed consent, confidentiality, justice and data protection that all aim at participant protection. This theme captures the dual challenges of conceptual comprehension and procedural familiarity that limit students' ability to apply ethical principles effectively in research.

Participants frequently demonstrated a superficial understanding of research ethics concepts, often confused with concepts such as plagiarism or general academic honesty. While most students were aware of the term "ethics," their explanations revealed confusion about core concepts such as informed consent, confidentiality, and risk–benefit assessments.

> *"I still get confused between research ethics and academic honesty"* (PS00010),

while another reflected,

> *"ethics are moral guidelines… but [another value] is how the person will be honest"* (US00040). *"Ethics is a policy of making sure that research is conducted the right way,"* while differentiating it from *"forgery or falsification of data"* (PS30060). *"Ethics involves gathering the information,"*

whereas other values concern obtaining

> *true data from the true source"* (PS60030).

These accounts indicate that, even when terminology is familiar, students have limited conceptual understanding, making it difficult to reason through ethical challenges systematically. The interviewed faculty agreed with this observation, explaining that

> *"In the course, we try to bring in some topics on research ethics such as ethical clearance, informed consent, confidentiality and privacy, however it's not something which is really elaborated …"* (DH00040).

This is done without deeper engagement, discussions, and the opportunities for practicing the implementation of ethics knowledge outside of research proposal requirements before ethical approval.

There were participants who understood the university institutional ethical review and clearance procedures. However, some participants reported limited awareness of ethical review processes and approval procedures, including the role of ethical review boards including requirements for obtaining ethical approval. The lack of exposure and awareness shows lack of awareness in research ethics practice especially when navigating formal research processes and their confidence in meeting ethical expectations.

> "*When I was about to select the topic… I didn't know anyone to contact … I was not aware of the institutional review board or its role" – (US290050).*

> *"Before starting data collection, I must have my proposal approved by the respective Institutional Review Board (IRB). After obtaining approval, I need to conduct the research as structured in my proposal. Additionally, during the publication process, I must respect the guidelines, meaning if I submit my manuscript to one journal, I cannot submit it to another simultaneously"*- (PS33060).

> *"… .in Rwanda we have an ethical clearance committee, where we apply, there is a website, we find the relevant information and also as students, we can apply at the college level"*- (PS10010).

> *"We didn't know the policy of the institution for research ethics in our [program]"*- (PS30020).

> *"Research ethics is a set of the principles and the guidelines which help the researchers to protect the participants and to keep the research safe, that is the way I can define the research ethics"* -(PS29050).

Theme 3: Barriers to translating knowledge of research ethics into practice

The understanding of ethics was often centered around formal principles and procedures, but oftentimes their lived experiences revealed other challenges. This theme captures how community, structural, and financial factors beyond students' control posed barriers to upholding ethical research conduct. These challenges show students' ethical preparedness and navigating ethical areas without sufficient support and guidance.

Sub-theme 3.1: Community expectations, dynamics and misconceptions

In this theme participants views indicate that ethical research conduct demands understanding of norms, expectations, building trust with communities, good interpersonal dynamics, and the need for seeking support from experienced

researchers. In some cases, ethical violations occurred unintentionally, due to researchers' unpreparedness for real-world research setting and expectations. Blurs of clinical practice and research; an awareness of privileges gained due to doctor's status gained in a hospital setting, participants label of being your patients and unintentional potential harm were all possible research experience dynamics.

> *"In clinical-based data, you're likely to get the data even if you didn't have to explain them. They only see you in white coat and think you're a doctor, giving you all the information"* -(PS 70040).

> *"I saw a student who used that opportunity to just collect data without explaining why, without giving the informed consent because as residents we are always interacting with research participants as our patients"*- (PS 70040).

> *"I just recorded people without telling them … when we were about to finish, they weren't happy"* (PS60030).

The challenges in effectively practicing informed consent were due to dynamics of navigating real-world research complexities and emotionally sensitive situations. Participants frequently described situations where maintaining confidentiality clashed with social or cultural expectations, generating uncertainty and ethical tension even when they knew the correct course of action.

> *"There is this guy who was like 20 years old, there was a question asked about their time they had their first sex experience, and he told me that it was when he was about 12 years old and on how many partners he has now. He didn't even know the number of all sexual partners he has currently, and I know his girlfriend. I was puzzled and asked myself if I can tell his girlfriend or not"*- (US00090).

> *"… Sharing research participants' information, can have dire consequences, including putting people's lives at risk or compromising their privacy. We deal with sensitive health issues, and confidentiality is crucial"*- (PS31070).

> *"You have to be confidential during research … sometimes I asked myself If I can share the HIV status to the partner or not, because it's not allowed"* -(PS30060).

These moments revealed ethical issues not easily addressed through formal instruction alone, especially in the context where research ethics teaching is not clearly integrated in the medical and health sciences research education. Ethical decision-making in these contexts was not abstract but relational, immediate, and emotionally charged, and not grounded in ethical reflection informed by normative theories or principles.

Students encountered expectations from community members that blurred ethical boundaries. Participants alluded to unspoken assumptions about compensation and reciprocal benefits for participating in research encountered during their fieldwork but were never informed, in classes or textbooks, about how to handle such situations ethically.

> *"Sometimes you know that if you explain to people about your study and they know that you will not give them anything in return, they refuse to give you the information. Everywhere you go they are asking what are you going to give us, what is the tangible thing we will get; and you know that if you give them money, they will just respond for the purpose of getting money, hence creating bias. So, you're ask yourself if you do not need to explain all details and just get information you need as you don't have enough finances to sponsor the research. You don't want to take them to the advantage, and you're like am I going to follow the ethics or not, just explain to them all details and just take data"*- (PS70040).

These realities underscore the tension between ethical ideals, clinical and ground-level community expectations, and needs of building ethical practice experience to conduct ethical research.

Sub-theme 3.2: Financial limitations

A recurring barrier to ethical research conduct was the scarcity of funding resources. For many students, conducting research ethically was not just about *"doing the right thing"* but about whether they had the time, money, and institutional access to do it at all. In Rwanda, most university students are either self-funded or receive funding through government loans, with limited access to additional research grants. This reliance on personal and loan-based funding often restricts the resources devoted to their research projects. A student said:

"Without proper funding, you can't ensure proper consent or privacy, and sometimes that's where ethical breaches start" – (US 290050).

"To conduct research without having the finances … it's not really practical"- (PS60030).

"Sometimes, the review board may request fees that are unaffordable, and the approval process can be lengthy, leading to delays …." - (PS33060).

Discussion

This study explored the perspectives of faculty and students on research ethics education approaches, learning, and practices in Rwanda. For many students, ethics instruction was compressed into brief sessions within broader research methodology courses, often delivered in large lecture halls or through self-directed online reading. Such modes of delivery limited opportunities for interaction, reflection, and dialogue. As a result, their confidence in ethical decision-making remained low, even when they were familiar with some vocabularies used in scientific, social value, consenting and respect of participants' rights and welfare. Consistent with previous findings, inconsistent application of ethical guidelines, the lack of engagement, discussions, and asking questions possibilities left students with little or basic ethics knowledge and skills to supports their research process (Makola & Ntoyanto-Tyatyantsi, 2023b; Prosper Dzifa Dzamesi et al., 2025). This stands in contrast to social constructivist perspectives, which hold that knowledge develops through active engagement, guided support, and the co-construction of meaning in social and institutional contexts (Adams, 2006; Beaumie Kim, 2006; L. S. Vygotsky, 1978). Therefore, research ethics education should move beyond passive, lecture-based approaches toward methods that emphasize timely active engagement, mentorship, and reflective practice throughout the whole research journey. Incorporating interactive and practice-oriented learning strategies within research training may enhance the internalization and consistent application of ethical principles in real-world contexts in Rwanda and similar contexts.

Large lecture formats, short modules, and self-directed reading, neglect the dialogic and mentored engagement required for ethical competence (Anthony, 1996; L. S. Vygotsky, 1978). This mismatch confirms that constructivist learning demands opportunities for students to co-construct meaning and practice application, yet current approaches offer little space for such authentic negotiation. Field struggles reported here underscore that without experiential learning and sustained mentorship, ethics instruction remains abstract and difficult to translate into practice (Balandya et al., 2021; Ernest, 1998).

The findings further demonstrate that while students could name concepts such as informed consent and confidentiality, they struggled to explain how these apply in practice or to distinguish between concepts of research ethics. Many students identify academic honesty and personal morals as key principles of research ethics, but these values more accurately reflect research integrity, which emphasizes honesty, transparency, and rigor in the research process (National Academies of Sciences, Engineering, and Medicine et al., 2017). This suggests students focus on personal morality rather than the ethical principles; such as respect for persons, beneficence, and justice that govern interactions with research participants and societal responsibilities (Cassell, 2000). Consequently, although students may have some awareness of ethical norms, they often lack the practical skills in study design, data interpretation, and research execution needed to uphold integrity in practice (Habineza et al., 2019). This mismatch between ethical awareness and methodological competence shows that knowing moral principles alone does not guarantee trustworthy and rigorous research conduct. Furthermore, while many students attend research methodology modules, limited confidence and knowledge indicate that current training may prioritize theory over the practical competencies required to integrate ethics and integrity effectively in their research conduct (Mugabo et al., 2021).

The inconsistencies in theory-practice were particularly evident when students approached ethical conduct in real research settings. While they expressed some familiarity and awareness of basic ethics principles, when faced real-world dilemmas such as navigating patient expectations, handling sensitive disclosures, and coping with time constraints, lack of understanding was further acknowledged. This pattern, consistent with prior studies, suggests that current ethics trainings may prioritize conceptual understanding over the situational judgment required in the field (Chmura & Nagraj, 2024; Hlaing et al., 2023; Uwishema et al., 2024). These moments illustrate that ethical reasoning is not only cognitive but also relational and situational. Lived experience is central to how meaning is made, and in this case, students' encounters with research participants reveal that decision-making regarding ethical issues is often emotionally charged and context dependent (van Manen, 2016). Students' calls for case-based learning, small group discussions, and mentorship reflect a recognition that ethical competence requires guided practice in realistic scenarios rather than passive absorption of content. This active learning becomes meaningful only when coupled with opportunities for reflection and application (Anthony, 1996; Ernest, 1998; van Manen, 2016).

The gap between the research ethics learning, education and current practice suggests that prevailing approaches risk reducing ethics to a procedural checklist rather than cultivating genuine ethical competence and capacity of ethical reasoning (Andersson et al., 2022). Additionally, this gap shows that students memorize terms such as *confidentiality* rather than develop the skills needed to support them during ethical deliberation and to meet legal confidentiality requirements (Bertolami, 2004; Republic of Rwanda, 2021, 2022). This is in contrast to with the fact that ethical understanding must be negotiated in real world contexts through active meaning-making (Bruner, 1996; Ernest, 1998).

Another layer of complexity emerged in the structural and systemic barriers to ethical research conduct. Even when students were motivated to apply ethical principles, financial constraints, limited mentorship, and bureaucratic inefficiencies in ethics-clearance procedures often forced compromises. Consistent with earlier studies, participants described beginning data collection before approval because of time pressures or struggling to secure informed consent when community members expected compensation they could not provide (Alemayehu et al., 2018; Dadipoor et al., 2019; Snooks et al., 2023). These findings reinforce prior critiques that ethical lapses cannot be reduced to individual ignorance or negligence; they are frequently produced by institutional incentive structures that reward speed and output over deliberation and quality (Bouter et al., 2016; Gopalakrishna et al., 2022; Snooks et al., 2023). But learning is shaped not only by individual agency but also the institutional and cultural ecosystems in which learners operate (Beaumie Kim, 2006). The students' frustration and reluctant compromises illustrate how these ecosystems actively constrain the very ethical reasoning that formal curricula attempt to instil, echoing (van Manen, 2016) observations on the affective costs of navigating unsupportive systems.

The expression of needs for experienced researchers to guide juniors coupled with lack of effective consenting process and starting research without approvals calls building effective mentorship to build a practice of research ethics principles from experienced researchers. Accordingly, consistent with previous studies where participants understand and apply research ethics as procedural requirements, research-ethics education should move beyond procedural teaching to provide structured opportunities for active, practical, and reflective learning while ensuring accessible and transparent ethics-review systems (Makola & Ntoyanto-Tyatyantsi, 2023a; Shamim et al., 2021). Effective curricula must also integrate context-specific challenges such as local cultural expectations, resource constraints, and emerging technologies such as the use of AI in health research rather than assuming that universal principles alone suffice (Grancia, 2025; Shaw et al., 2024). Ultimately, aligning ethics training with a social-constructivist and phenomenological framework means recognizing students not as passive recipients of knowledge but as active constructors of ethical knowledge who negotiate tensions between formal instruction, lived experience, and systemic constraint (Beaumie Kim, 2006; van Manen, 2016). Such alignment would not only address the gaps revealed in this study but also respond to the wider critique that ethics education too often ignores the institutional realities that shape ethical judgment and decision making (Drolet et al., 2023).

Strengths and limitations

This study grounded in students lived experiences and which provided insights into the gap between theoretical knowledge and ethical research conduct provide its strengths. The use of a constructivist–phenomenological lens allowed for a richer interpretation of how context shapes ethics learning, practice and decision-making. However, the findings are limited by the study's focus on a single country and specific programs, which may affect generalizability. Self-reported accounts may also be influenced by recall bias or students' desire to present themselves positively. Future research could expand to multiple institutions and countries to build a more comprehensive understanding of how ethics education and ethical research conduct practice can be strengthened.

Conclusion

This study shows that while students in Rwanda's medical and health sciences programs generally possess some awareness of core ethical principles, their ability to apply them in research conduct is constrained by structural, contextual, and pedagogical factors. Challenges such as community expectations, financial constraints, limited supervisory support, lack of accurate understanding of ethics concepts and inefficiencies in ethical clearance processes including inadequate follow-up of approved projects often placed students in situations where effectively upholding ethical standards felt impractical. Instances such as beginning data collection before approval or navigating sensitive disclosures illustrate the gap between knowing what is ethically required and being able to apply those standards in real-world research settings.

These findings highlight that ethical competence cannot be achieved through abstract teaching alone. Consistent with constructivist perspectives, ethics education must extend beyond content delivery to provide experiential, dialogical, and context-sensitive learning opportunities that reflect the practical realities students encounter. At the same time, institutions need to strengthen supervisory systems, interdepartmental collaborations for sharing resources and experiences, streamline ethical review and approval, and follow-up procedures, and create enabling environments that support

researchers. Finally, programs can move from superficial awareness toward meaningful engagement, cultivating resilient, reflective practitioners who are prepared to uphold ethical standards in diverse, culturally influenced, and challenging research contexts.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author used UiO GPT to gain an understanding of other existing similar work. UiO GPT and Chat GPT were also utilised to obtain suggestions of reading literature, existing literature on similar topic(s). After using these tools, the author(s) all AI results before being utilised in the citations.

Ethics approval

Ethical approval and renewal (No. 424/CMHS-IRB/2022 and No. 362/CMHS-IRB/2024) were obtained from the Institutional Review Board (IRB) of the College of Medicine and Health Sciences, University of Rwanda and NSD approval No.125830. All participants voluntarily signed informed consent forms after being fully briefed on the study's purpose, objectives, benefits, risks, privacy, confidentiality, voluntary participation, and withdrawal from the study, with no implications.

Availability of data and materials

Underlying data

Repository name: Not applicable

The project contains the following underlying data: Not applicable

Extended data

Repository name: Health Research Ethics and Research Integrity Education and Training in Rwanda. https://doi.org/10.18710/U6Y9D2(Pacifique Ndayishimiye, 2026).

This project contains the following extended data:

- Supplementary: Participants information sheet and example of informed consent provided to participants.
- Interview guides that were used during data collection. Data are available under the terms of the Creative Commons Zero "No rights reserved" data waiver (CC0 1.0 Public domain dedication).

The underlying qualitative interview transcripts generated and analysed during the current study are not publicly available. Although direct identifiers have been removed, the transcripts still contain detailed contextual information, participant narratives, and potentially identifiable characteristics that could permit re-identification of individual participants, particularly when combined with other publicly available information. Consequently, the data cannot be sufficiently de-identified to ensure participant confidentiality and privacy. In accordance with applicable EU and national data protection legislation, including the General Data Protection Regulation (GDPR), unrestricted public sharing of the interview transcripts would not be consistent with the consent provided by participants and could compromise their privacy.

The study protocol and consent procedures, as approved by the relevant Research Ethics Committee, did not permit unrestricted public release of the interview data. The Ethics Committee (University of Rwanda College of Medicine and Health Sciences Institutional Review Board) determined that participant confidentiality should be protected through controlled access arrangements. Researchers who wish to access data supporting the findings of this study may submit a reasonable request to the corresponding author on the following email: pacifiqn@uio.no and will be granted where the proposed use is consistent with the participants' consent, ethical approval, and applicable data protection requirements.

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The authors tackle a critical issue about ethics training in Africa, specifically Rwanda which can contribute to research in ethics education.

The conceptualization and operationalization of ethics is not clear. the authors throughout the manuscript fail to let the reader know how they define and operationalize ethics inn the context of the research. Are they referring to medical ethics, relational ethics, or an ethics of care? This makes it difficult to understand what the researchers were actually looking for and this reflects in the findings. For example, students rightfully conceptualized ethics to include performative actions such as plagiarism and academic honesty but you claim these are not accurate.

A lot of the literature context while seemingly empirical, look speculative. In the introduction, you mention that ethics instruction is often partial/not engaging/absent but the examples provided do not support that argument. Ethical approval does not necessarily determine the instruction provided. If students are perceiving ethics as something else, I think the best question or hypothesis would have been about the sources of their knowledge which none of the cited literature does. The authors also seek to bring in the idea of knowledge plurality and I think a stronger framing of how minimal context specific curricula influence ethics education would be helpful.

The journal of geoethics and social geoscience recently published a special issue on ethics in Africa and I think it might be a useful resource to refer to.

Overall, the research framing and contribution are not clear from the onset. It is difficult to identify the contribution of the paper (research or teaching) which even makes the title ambitious.

What is maximum variation sampling? These and under methodological terms need to be defined.

I am not sure about what your IRB and consent message was but bringing in university name can

be a source of participant identifier.

You can provide the interview guide/prompts as supplemental materials and then cut off on the words here.

Is the first author a native of Rwanda? I think that would also be a strong justification for your positionality during interviews.

The method section is strong and looks appropriate for the study. My only suggestion would be to add more information on how codes were actually developed? How was the the recursive phases applied and by whom? Who and who refined the themes and how was this done? For example. in the result how did research ethics pedagogy became a sub-theme of research ethics learning context?

What about the reflexivity of the other researchers/authors? I think trustworthiness is usually co-constructed.

More information on the codebook and themes developed would help strengthen the results section and easy to read. Most of the sub-themes do not reflect the how the major themes are conceptualized. As currently written, it is difficult to follow the results and what the major messages are. The same thing appears in the discussion. The discussion makes a lot of claims that are not sup[ported by the findings.

How did constructivists phenomenological design allowed for richer interpretation? You also claim here that the research is grounded in students' lived experiences Burt they were not the only source of data in the study.

There are too many irrelevant use of punctuation marks, grammatical errors, and repetitions in the manuscript which makes it hard to read.

The in-text citations are not consistent. Check the journal requirement and be consistent throughout.

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and does the work have academic merit?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Not applicable

Are all the source data underlying the results available to ensure full reproducibility?
No source data required

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Science education research

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.