

Humanistic Pedagogy in Ghanaian Senior High School Mathematics: Teachers' Understandings, Practices and Challenges.

Abstract:

Humanistic pedagogy emphasises meaningful learning, learner agency, supportive relationships, psychological safety, and whole-person development. Although learner-centred, constructivist, culturally responsive, and competency-based approaches have received increasing attention in Ghanaian mathematics education, little is known about how mathematics teachers interpret these practices through an explicitly humanistic lens. This qualitative descriptive study explored the understandings, reported practices, and implementation challenges of seven Ghanaian senior high school mathematics teachers enrolled in an MPhil Mathematics Education programme. Individual semi-structured interviews were conducted in September 2026 and analysed thematically. Five themes were developed: making mathematics meaningful by connecting it to learners' worlds; repositioning classrooms around participation, care, and whole-person development; perceived changes in learners' relationships with mathematics; practical and institutional constraints; and teacher agency in response to constraints. Participants described humanistic pedagogy through contextualisation, concrete and discovery-oriented learning, facilitation, collaboration, respectful relationships, emotional sensitivity, and holistic development. They perceived these practices as supporting interest, participation, and conceptual understanding, while identifying barriers including inadequate resources, difficulty contextualising some concepts, teacher-preparation needs, learner diversity, time pressure, curriculum coverage, and examinations. The findings suggest that humanistic mathematics

pedagogy in this context extends beyond learner-centred activity to include meaningfulness, care, learner voice, psychological safety, and whole-person development.

Keywords: humanistic pedagogy; mathematics education; qualitative research; teacher perceptions

Introduction

Mathematics is central to school learning, yet learners may experience it as abstract, procedural, and disconnected from everyday life. These experiences are especially likely when instruction privileges transmission and reproduction of procedures over questioning, exploration, collaboration, and personal meaning. Humanistic education offers a lens for reconsidering mathematics learning by attending not only to what learners know but also to how they experience learning as persons.

Humanistic education is associated with personal meaning, autonomy, supportive relationships, growth, and the development of human potential (Maslow, 1954; Rogers, 1969). Rogers (1969) translated these ideas directly into education by emphasising significant learning and the teacher's role as a facilitator who creates conditions for learners to participate meaningfully. In mathematics education, this orientation has been used to challenge negative perceptions of the subject and to foreground dignity, participation, supportive relationships, and links between mathematics and lived experience (Haglund, 2004; Khadka et al., 2023; Vimbelo & Bayaga, 2023).

Humanistic pedagogy overlaps with, but is not identical to, constructivism, culturally responsive pedagogy, and learner-centred education. Constructivism primarily concerns how learners actively construct knowledge, while culturally responsive pedagogy foregrounds learners' cultural knowledge and identities. Humanistic pedagogy may incorporate these practices but

adds explicit concern for dignity, agency, emotional experience, supportive relationships, personal meaning, and whole-person development.

These issues are relevant in Ghana, where mathematics policy and research increasingly emphasise active and contextualised learning. The secondary mathematics curriculum promotes application, discovery, and meaningful understanding (National Council for Curriculum and Assessment [NaCCA], 2023). However, Ghanaian studies indicate persistent gaps between pedagogical aspirations and classroom realities. Ampadu and Danso (2018) showed that cultural and social classroom practices can constrain participation. Oppong-Gyebe et al. (2023) reported that senior high school teachers viewed aspects of mathematics as rigid and abstract and were not always confident connecting classroom activities to real life. Nyamekye et al. (2023) similarly identified a perception-practice gap in constructivist teaching, partly associated with limited time and resources.

Recent Ghanaian work extends these concerns. Gbormittah et al. (2025) found limited integration of learners' sociocultural experiences in senior high school mathematics, while Armah et al. (2026) reported that learner-centred competency-based practices were constrained by curriculum overload, high-stakes examinations, limited resources, and insufficient professional learning. These studies establish the importance of relevance, participation, and implementation conditions, but they have largely been framed through constructivism, culturally responsive pedagogy, curriculum implementation, or competency-based reform.

Comparatively little published empirical attention has focused on how Ghanaian mathematics teachers understand these practices through an explicitly humanistic lens that integrates meaningful mathematical experience with learner dignity, voice, supportive relationships, emotional safety, participation, and whole-person development. This study addresses that

contextual and conceptual gap by exploring teachers' understandings of humanistic pedagogical principles, their reported enactment of those principles, and the challenges they experience in doing so.

The study addressed three questions:

1. How do mathematics teachers understand and perceive humanistic pedagogical principles in mathematics teaching?
2. How do mathematics teachers describe the enactment of humanistic pedagogical principles in their mathematics classrooms?
3. What challenges do mathematics teachers experience in enacting humanistic pedagogical principles in mathematics classrooms?

Theoretical and Conceptual Framework

The study is interpreted through humanistic learning theory, particularly Rogers' (1969) educational work. Rogers positioned meaningful learning as personally relevant and participatory and described the teacher primarily as a facilitator who creates a climate of trust rather than coercion. Maslow's (1954) emphasis on human growth and potential provides a broader humanistic foundation. Applied to mathematics, this perspective does not reject rigour or teacher expertise; instead, it asks how rigorous learning can occur while learners remain active participants whose experiences, emotions, relationships, and developmental needs are recognised.

This interpretation is consistent with humanistic and humanising mathematics scholarship. Haglund (2004) linked humanistic mathematics teaching to motivation and negative perceptions of mathematics. Khadka et al. (2023) described mathematics teachers' humanistic roles through dignity, integrity, and freedom, while Vimbelo and Bayaga (2023) emphasised student

engagement, lived experience, and real-life relevance. In the present study, humanistic pedagogy is therefore distinguished from constructivism by its broader attention to the person who learns, including dignity, care, emotional safety, agency, and whole-person development.

The conceptual framework treats five principles as interrelated: meaningful and contextualised learning; learner-centred facilitation and agency; caring and psychologically safe relationships; holistic development; and inclusive participation. These principles are expressed through reported classroom practices such as familiar examples, concrete materials, discovery, group work, projects, problem-based learning, dialogue, and peer learning. Enactment is shaped by contextual constraints, while teacher agency influences how those constraints are negotiated. Reported learner outcomes are interpreted as teachers' perceptions rather than demonstrated causal effects. The framework was used after initial theme development as an interpretive lens rather than as a predetermined coding scheme.

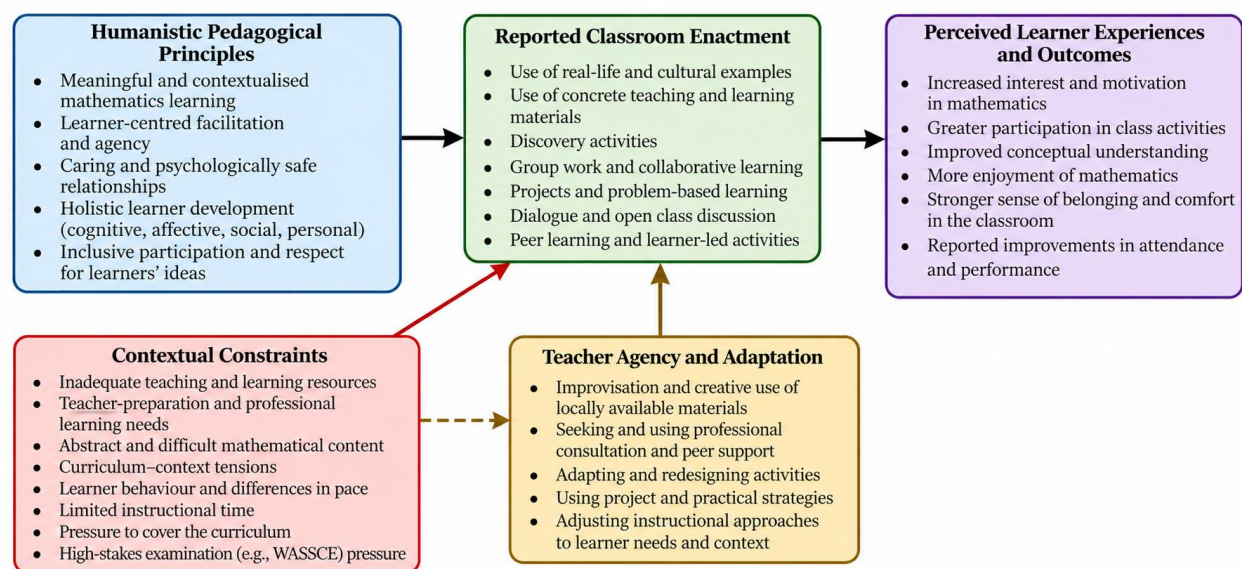


Figure 1. Conceptual framework linking humanistic pedagogical principles, reported classroom enactment, contextual constraints, teacher agency, and perceived learner outcomes.

Methods

Design and Participants

The study used a qualitative descriptive design because it sought a close account of teachers' understandings and experiences rather than causal explanation or statistical generalisation (Sandelowski, 2000). Seven senior high school mathematics teachers enrolled in an MPhil Mathematics Education programme at a public university in Ghana participated. Four were male and three were female; teaching experience ranged from 2 to 15 years (mean = 7 years). Purposive sampling was used because all participants were practising mathematics teachers able to provide information-rich accounts. The sample was considered in relation to information power rather than statistical representativeness (Malterud et al., 2016).

Participants taught in seven different senior high schools. To reduce deductive identification, school names are not reported and participants are identified as P1-P7.

Table 1. Participant characteristics

Participant	Gender	Teaching experience (years)
P1	Male	5
P2	Female	2
P3	Male	15
P4	Male	15
P5	Male	5
P6	Female	3
P7	Female	4

Data Collection and Analysis

Data were collected in September 2026 through individual semi-structured interviews. The guide explored participants' understandings of humanistic pedagogy, its relevance to mathematics teaching, reported classroom practices, perceived effects on learners, and implementation challenges. Follow-up probes were used to clarify experiences and obtain concrete examples. With verbal consent, interviews were audio-recorded, transcribed, anonymised, and organised using participant codes.

The data were analysed thematically, informed by Braun and Clarke (2006, 2021). Analysis involved familiarisation, coding of meaningful segments, participant-level analysis, cross-case comparison, and development and review of candidate themes. Themes were treated as patterns of shared meaning rather than counts of responses. Attention was given to variation and potentially contradictory accounts. The theoretical framework was applied after the initial themes were developed so that it informed interpretation rather than predetermining the coding.

Analytical rigour was supported by maintaining traceability from themes to participant-level evidence, reviewing candidate themes against the full dataset, retaining divergent accounts, and documenting coding decisions and attribution corrections. Claims about learner motivation, attendance, understanding, or achievement were treated as teacher perceptions because these outcomes were not independently measured.

Ethics

Ethical approval was obtained from the Institutional Review Board of the study university before data collection; the board did not issue a formal approval number. Participants received information about the study, voluntariness, confidentiality, and the intended use of the interviews. Verbal informed consent was obtained before each interview and audio recording.

Findings

Five themes captured how participants understood, enacted, and experienced humanistic pedagogy: (1) making mathematics meaningful by connecting it to learners' worlds; (2) participation, care, and whole-person development; (3) perceived changes in learners' relationships with mathematics; (4) practical and institutional constraints; and (5) teacher agency in response to constraints.

1. Making Mathematics Meaningful by Connecting It to Learners' Worlds

Participants commonly associated humanistic pedagogy with making mathematics relatable to learners' cultural and everyday experience and with reducing abstraction through familiar materials. P1 described the teacher's task as making content something learners could relate to while "bearing in mind their culture". When teaching cones, he used a familiar conical building from northern Ghana as an entry point into the concept.

"the teacher makes the content such that the students will be able to relate to it, bearing in mind their culture." (P1)

Other participants described related strategies: P2 connected mathematics with experiences from home and the journey to school; P3 used physical features to represent mechanics-related ideas; P5 used tins and thread when teaching pi; and P6 used containers and water to develop ideas about volume. P5's pi lesson illustrates the emphasis on exploration. Learners measured circumference and diameter across familiar circular objects and observed the recurring ratio rather than receiving the relationship only as a formula.

"you need not to bring an abstract object, but rather you can ask learners to bring things that they can see around, like Milo tin, tin tomato tin, thread and other stuff" (P5)

Across these accounts, meaningfulness was not simply an illustrative add-on. Participants saw concrete and contextual experience as a way to help learners investigate and understand mathematical relationships rather than rely only on memorisation.

2. Participation, Care, and Whole-Person Development

Participants also understood humanistic pedagogy as a change in classroom roles and relationships. P1 stated that "the student has to be at the centre and the teacher acts as a facilitator". Group work, projects, peer learning, discovery activities, and problem-based learning were described as ways of giving learners a more active role.

"Sometimes you have to put them into groups. Sometimes you give them projects. So, in that way, they are able to work with others to achieve a task." (P1)

The relational dimension was especially visible in P4 and P7. They described the importance of reducing intimidation, listening to learners, allowing learners to express themselves, and correcting errors without unnecessary humiliation or discouragement. These accounts suggest that humanistic teaching was not equated simply with activity: the quality of participation also mattered. P1, P4, P6, and P7 further described learning in cognitive, affective, social, and practical terms, indicating a concern with whole-person development.

"you are looking at their affective side as well as their cognitive side, even as we also pay attention to their psychomotor side." (P1)

3. Perceived Changes in Learners' Relationships with Mathematics

Teachers commonly associated humanistic practices with increased interest, participation, and conceptual understanding. P1 explained that when learners could relate mathematics to something they knew, "their interest is boosted and they are able to participate well in the learning". P5 reported that his pi activity generated curiosity to test increasingly large circular

objects, while P6 emphasised that discovery helped learners reconstruct mathematical ideas rather than depend entirely on memorised formulas.

"they started liking it. They started coming to class regularly, and they participated in the learning activities." (P1)

Some teachers also perceived improvements in academic performance, but these claims are interpreted cautiously because the study did not collect achievement or attendance data. The consistent finding concerns teachers' perceptions of a more positive learner relationship with mathematics, not demonstrated effectiveness.

4. Practical and Institutional Constraints

Participants identified barriers at several levels. Material constraints included shortages of teaching and learning materials. P1 noted that obtaining some TLMs was difficult, P2 referred to shortages of basic geometry tools, and P5 described limited access to graph boards. Participants also recognised that not every mathematical concept was easy to contextualise.

"Sometimes it is difficult to link the cultural setting to some of the concepts." (P1)

P2 emphasised teacher-preparation needs, arguing that resources alone were insufficient if teachers did not know how to connect mathematical ideas to learners' experience. P1 and P4 raised tensions around learner freedom, behaviour, and classroom order, while P5 noted that adjusting instruction to learners' pace could slow lesson progression. P7 connected this tension to curriculum coverage and WASSCE preparation. Humanistic teaching therefore operated within a persistent depth-coverage tension: responding to learners and creating participatory experiences often required time that teachers also needed for syllabus and examination demands.

5. Teacher Agency in Response to Constraints

Teachers also described adapting rather than simply accepting constraints. P1 had a carpenter make a wooden ruler and protractor when standard geometry tools were unavailable; P2 used cardboard and consulted colleagues; P5 used common tins and thread; and P7 used projects and problem-based activities. These examples show professional agency through improvisation, collaboration, and redesign of learning activities.

"I had to improvise. I had to see a carpenter to make a wooden ruler and then a protractor."
(P1)

Agency, however, did not remove structural limitations. Improvisation could compensate for missing materials but could not eliminate insufficient instructional time or high-stakes examination pressure. Humanistic pedagogy therefore emerged as a negotiated practice shaped by both teacher commitment and institutional conditions.

Discussion

The findings suggest that participants interpreted humanistic mathematics pedagogy through an integrated language of meaningfulness, learner agency, care, and whole-person development. Their descriptions overlapped with constructivism and culturally responsive pedagogy but extended beyond those approaches by foregrounding psychological safety, supportive relationships, and the learner as a developing person.

The strong emphasis on contextualisation is consistent with Ghanaian evidence that mathematics can be experienced as abstract and insufficiently connected to real life (Oppong-Gyebi et al., 2023) and that cultural and social orientations shape learner participation (Ampadu & Danso, 2018). The present study extends this work by showing that teachers interpreted contextualisation as part of humanising mathematics: formal ideas became more accessible when

learners could connect them to familiar objects, settings, and experiences. This is also consistent with Haglund (2004) and Vimbelo and Bayaga (2023), who link humanistic or humanising mathematics to meaningfulness, engagement, and lived experience.

However, the relational findings show why humanistic pedagogy cannot be reduced to contextualisation or activity. P4 and P7 emphasised respect, reduced intimidation, learner voice, and emotionally sensitive teacher behaviour. These ideas align with Rogers' (1969) view of facilitative learning and with Khadka et al.'s (2023) dimensions of dignity, integrity, and freedom. A classroom can contain group work or discovery and still be experienced as coercive; the humanistic distinction lies partly in whether learners are recognised as active and respected persons.

Participants' perceived benefits should not be read as evidence of causal effectiveness. Previous Ghanaian studies show that positive teacher perceptions do not necessarily translate into consistent practice (Gbormittah et al., 2025; Nyamekye et al., 2023). The current study instead contributes an account of how teachers themselves connect meaningfulness, participation, and supportive relationships with learner engagement and understanding. Classroom observation and student perspectives are needed to test those perceptions.

The reported constraints closely resemble broader implementation challenges in Ghanaian mathematics education. Resource shortages, time limitations, difficulties linking mathematics to real life, curriculum overload, examination pressure, and professional-learning needs have been documented across constructivist, culturally responsive, and competency-based reforms (Armah et al., 2026; Nyamekye et al., 2023; Oppong-Gyebi et al., 2023). This suggests that humanistic pedagogy is embedded in system-level tensions rather than being solely a matter of teacher preference.

Teacher agency was therefore important. Participants improvised materials, consulted colleagues, and redesigned activities, echoing Armah et al.'s (2026) account of teachers interpreting and adapting reform expectations within what they regard as feasible. Yet agency had limits: creativity could replace a missing tool, but not resolve structural time or examination pressures. Sustainable humanistic mathematics teaching therefore requires both teacher capability and institutional support.

A further cross-cutting finding concerned teacher biography. P1, P4, and P7 described former mathematics teachers whose encouraging or discouraging practices influenced their own teaching orientations. This suggests that humanistic pedagogy can be partly biographical: teachers may learn what care, authority, and meaningfulness mean not only through formal theory but through memories of being mathematics learners themselves.

The study's theoretical contribution is to clarify humanistic pedagogy as more than learner-centred activity. In this Ghanaian sample, its distinctive character lay in combining meaningful mathematical experience with agency, care, psychological safety, inclusion, and whole-person development. That combination offers a useful way to distinguish a humanistic mathematics classroom from one that is merely active or contextualised.

Implications

The findings suggest that professional development should move beyond generic calls for learner-centred teaching. Mathematics teachers need opportunities to examine how specific topics can be contextualised without distorting mathematical meaning, how participation can be balanced with structure, and how emotionally safe classrooms can be sustained alongside examination preparation.

Schools and education authorities should improve access to basic mathematics teaching resources while also supporting responsible improvisation and teacher collaboration. Curriculum and assessment arrangements should recognise that conceptually focused, participatory teaching requires time. Future research should include classroom observation and learner perspectives to examine whether teacher-reported humanistic practices and outcomes are visible in classroom interaction.

Limitations

The study involved seven teachers enrolled in one MPhil Mathematics Education programme, so the findings are contextually informative rather than representative of all Ghanaian mathematics teachers. The study relied on self-reported practice; classroom observations, learner interviews, attendance records, and achievement data were not used to verify reported enactment or outcomes. Some interview probes introduced ideas before participants responded, creating potential interviewer influence; detailed participant-generated explanations were therefore given greater interpretive weight than brief agreement. Finally, humanistic pedagogy overlaps conceptually with constructivist, learner-centred, culturally responsive, and humanising approaches, and that overlap should be considered when interpreting the findings.

Conclusion

The study shows that participating teachers understood humanistic mathematics pedagogy as an integration of meaningful and contextualised mathematics, learner participation, caring relationships, psychological safety, and whole-person development. They reported using practical materials, discovery, collaboration, projects, and locally familiar examples, while negotiating resource shortages, teacher-preparation needs, learner diversity, limited time, curriculum coverage, and examination pressure. Their accounts also show teacher agency

through improvisation and adaptation. Humanistic mathematics teaching in this context therefore appears less as a fixed method than as a negotiated commitment to mathematical rigour alongside relevance, participation, respect, and care.

Declarations

Ethics approval and consent to participate: Ethical approval was obtained from the Institutional Review Board of the study university before data collection; the board did not issue a formal approval number. Verbal informed consent was obtained from all participants.

Data availability: The interview recordings and transcripts are not publicly available because they contain potentially identifying qualitative data.

Author contributions: All aspects of the research were carried out solely by the author.

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