

APPENDIX

APPENDIX A

SURVEY AND OBSERVATION INSTRUMENTS VALIDATION LETTER

To

Date:

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Sub: PhD Research Study titled “A Study of the Mathematics Education Programmes in the Teacher Education Universities of Ghana” -Validation of Research Tools

Dear Sir,

I am Francis Ennin, a research scholar of the Faculty of Education and Psychology, Department of Education, The Maharaja Sayajirao University of Baroda, Gujarat, India. I have taken up a research study on the Mathematics Education Programs in the Teacher Education Universities of Ghana. I am at the tool development stage of my research.

With your expertise and experience in teacher education and research methodology, I humbly request you to validate my research tools by offering your candid review of my questionnaires and observation schedules to improve their quality for a better research outcome. Kindly keep the tools confidential and don't share them with other scholars.

Your cooperation will be highly appreciated. Thank you.

Researcher

Research Guide

Francis Ennin
Pushpanadham

Professor Karanam

APPENDIX B

Questionnaire for Teacher Educators

SECTION - A

BACKGROUND INFORMATION

Details of Teacher Educators (Only for official use. Personal identity will be kept confidential):

1. Gender: Male Female

2. Age Range: Below 30 30 - 40 41 - 50 51- 60 Above 60

3. Academic Qualification: Bachelors Masters (MEd) MPhil PhD

4. Teaching experience at the Higher Education level in years
 Below three (3) years 3 - 5 years 6 – 7 years 8 - 10 years Above ten (10) years

5. Professional development programmes attended in the last five (5) years
 None Below 3 4 – 6 7- 9 10 – 12 Above 12

6. Number of research projects completed/ongoing in the last five (5) years
 None Below 3 4 – 6 7- 9 10 – 12 Above 12

7. Number of articles published in journals in the last five (5) years

SECTION – B

Research Objective: To study the Mathematics Education Programs in the Teacher Education Universities of Ghana with respect to:

- Academic standards
- Curriculum design, development and implementation
- Evaluation procedures
- Resources at the TEUs – Human and Material
- Academic Leadership practices

ACADEMIC STANDARDS

Please provide your response against each statement by a tick (✓) in the appropriate box of your choice.

The corresponding values for each number in the scale of the agreement are:

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4– Agree 5 – Strongly Agree

	Statement/Opinion	1	2	3	4	5
Admission Process						
1.	Admission of pre-service teachers is strictly on merit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Admission procedures are strictly followed per the regulations of my University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	There is biasness in admission processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Gender equality is strongly considered in the admission processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	The entry characteristics of pre-service teachers are prioritized to ensure the admission of eligible students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Staff Recruitment and professional development						
6.	Administrative staff are regularly given in-service training to perform better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	The University advertises vacant positions to attract applications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Suitable candidates are selected on merit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	The University give feedback to both successful and unsuccessful candidate after interview.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	New staff members are trained to ensure better performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	The institution has sponsorship opportunities for Teacher Educators to upgrade themselves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Teacher Educators are regularly checked for professional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13.	Teacher educators are regularly supervised to ensure the right practices are being used for academic activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Conferences and Seminars are regularly organized to keep up-to-date with the current trends in Mathematics teacher education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching-Learning Activities						
15.	The university ensures teacher educators have good knowledge in their areas of expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	There is no recognition system to encourage hardworking teacher educators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	The Mathematics Education Department is held responsible for the standards of graduating pre-service teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	Extra-curricular activities are given equal priority as academic activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	There is no monitoring system for pre-service teachers attendance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	The university administration regularly provides material for teaching and learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Evaluation procedures are strictly supervised to ensure pre-service teachers are properly evaluated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION - C

CURRICULUM DESIGN, DEVELOPMENT AND IMPLEMENTATION

Please provide your response against each statement by a tick (✓) in the appropriate box of your choice.

The corresponding values for each number in the scale of the agreement are:

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4– Agree 5 – Strongly Agree

	Statement/Opinion	1	2	3	4	5
Design						
1.	Teacher Educators are not involved in the designing of the curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Experts from other Institutions are invited to contribute to the design process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Current/international trends in Mathematics Teacher Education are considered in the design process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	The curriculum is designed to reflect the national aims of mathematics education.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Priority is given to the academic standards of the programme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	There are no measures enshrined in the curriculum to ensure that the academic standards are upheld	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Essential concepts such as ICT integration are highly considered in the design process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	The key skills to be acquired are highly regarded in the design process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	The curriculum is designed to meet the quality standards of Higher Education regulation bodies of Ghana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development						
12.	The curriculum is regularly updated to meet current trends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Curriculum experts are occasionally invited to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	assess the curriculum					
14.	The curriculum is compared to the international community and upgraded to meet international standards to enable graduates to compete on the global stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Graduates of the programme are not in any way consulted for their inputs based on their field practising experience in the development process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	The curriculum seldom goes through any evaluation to ensure it is achieving the intended goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	Other stakeholders outside the institution, such as educational directors and head teachers, are occasionally asked about their assessment of the products of the programme for curriculum improvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementation						
18.	Teacher Educators possess the necessary qualifications and skills to implement the curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	There is a lack of the necessary materials for classroom curriculum implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	A suitable learning space that supports student understanding of the key skills, concepts, and soft skills is provided	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Emphasis is placed on correct evaluation processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	The role and style of assessment are defined for measuring the intended skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	There is a lack of supervision to ensure the appropriate methodologies are used for classroom transaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	Students are regularly allowed to appraise Teacher Educators' methods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25.	Teacher educators regularly meet to discuss teaching and learning processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.	Feedback on pre-service teachers' performance is prioritized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION - D

ACADEMIC LEADERSHIP PRACTICES

Please provide your response against each statement by a tick (√) in the appropriate box of your choice.

The corresponding values for each number in the scale of the agreement are:

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4– Agree 5 – Strongly Agree

Statement/Opinion		1	2	3	4	5
Knowledge						
1.	Leaders demonstrate positive and high expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Leaders successfully handle conflicts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Leaders are always up to date with new developments in the field of Mathematics Teacher Education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Leaders depict signs of lack of knowledge in some situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadership Experience						
5.	Leaders generally are aware of all processes involved in the training of pre-service teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Leaders are experienced and have the necessary qualifications as depicted by institutional rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Leaders have enough leadership training and act accordingly, always	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Some leaders lack the required experience a leader should exhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadership Relationships						
9.	Leadership models the value and behaviours that support pre-service teacher and Teacher Educator achievements and collaboration at all levels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	The necessary measures are in place to encourage collaborative leadership and decision making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Leaders support creativity, innovation, and appropriate risk-taking in the course of meeting pre-service teachers' needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12.	All people are treated equitably by leaders in all situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Leaders treat all members with dignity and respect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Leaders give members lots of appreciation and support for their contribution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Leaders treat pre-service teachers with no respect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadership Professionalism						
16.	I am content with the process of selecting leaders for my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	All qualified Teacher Educators are given equal opportunities during the selection process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	The leadership selection process is spelt out in the regulations of the institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Institutional goals are clearly spelt out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	Leaders pay attention to the academic needs of all members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	When new responsibilities are issued, leadership understands the need to “take things off the plate” and takes appropriate action. People are free to let go of previous obligations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	Leaders readily accept constructive criticisms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	Leaders establish rules and live by them consistently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	The leadership selection process is followed as stipulated in the regulations of the institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION – E

Research Objective: To identify the challenges encountered in training pre-service Mathematics teachers in Teacher Education Universities

CHALLENGES ENCOUNTERED IN TRAINING PRE-SERVICE MATHEMATICS TEACHERS

Please provide your response against each statement by a tick (√) in the appropriate box of your choice.

Whereas the corresponding values for each number in the scale of the agreement are:

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4– Agree 5 – Strongly Agree

Statement/Opinion		1	2	3	4	5
Academic Challenges						
1.	The curriculum for training is not written correctly with clearly spelt out procedures and evaluation processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	There is not enough time to execute the necessary procedures for training pre-service teacher	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	There is not enough time to do research for professional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	The best pre-service teachers academically are not recruited for training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	There is not a conducive environment for teaching and learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	There is no cooperation between colleagues in my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	There are not enough Teacher Educators in my institution, which increases the workload for the few Teacher Educators available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Resource Challenges						
8.	There are not enough lecture halls for classroom transactions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	The university/departmental library does not have current books for reference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Current teaching resources, especially in the field of	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	technology, are not provided on time for academic advancement					
11.	Most of the teaching-learning resources are outdated, damaged or not available to Teachers Educators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	The necessary tools for ICT integration are not available to Teacher Educators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Welfare Challenges						
13.	There is a lack of recognition for the Teacher Educators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	There are fewer opportunities for promotion in my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	There is an uneven workload in my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	There is no reward system for good performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	There are not enough opportunities for professional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	There is job insecurity which makes Teacher Educators unstable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Remuneration on the job is not enough. Teacher Educators have to engage in other jobs to complement their salaries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	It isn't easy to maintain a balance between work and life situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION F

Research Objective: To suggest recommendations to improve the training process of the Mathematics Education Programs in the Teacher Education Universities of Ghana

RECOMMENDATIONS TO IMPROVE THE TRAINING PROCESS

Please suggest the necessary change that can be effected to improve the training of pre-service Mathematics teachers of the MEPs of the TEUs of Ghana.

Suggestions to improve the **Academic Standard** of the programme

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Suggestions to improve **Curriculum design, development and Implementation**

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Suggestions to improve the **Evaluation Methods/Practices**

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Suggestions for improvement regarding **Resources at the TEUs – Human and Material**

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Suggestions for improvement in the **Academic Leadership Practices**

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Suggestions to improve the **Learning Culture** of the programme

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Other suggestions to improve the training of pre-service teachers

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Questionnaire for Students (Pre-Service Mathematics Teachers)

SECTION - A

BACKGROUND INFORMATION

Please, give your response by putting a tick (√) in the appropriate option box or write your response in the space provided.

1. Gender: Male Female

2. I have passed WASSCE with aggregate (grade of best six subjects including elective Mathematics) _ _ _ _ _ _ and with a grade of _ _ _ _ _ in Elective Mathematics.

I have gained admission as a post-diploma/matured entrant. Yes No

3. My main occupation choice after this programme would be:

Job Self-employment Further studies Don't know Other _ _ _ _
_ _ _ _

4. I have chosen this programme mainly due to:

Advice by friends Advice by school teachers Insistence by parents
Advice by a counsellor Advice by relatives I want to be a teacher Other
_ _ _ _ _

5. I am residing:

At the Institution hostel With my parents With a relative In a
private hostel Other _ _ _ _ _

6. My final goal is to settle abroad: YES NO

Research Objective: To study the Mathematics Education Programs in the Teacher Education Universities of Ghana with respect to:

- Academic standards
- Curriculum design, development and implementation
- Evaluation procedures
- Resources at the TEUs – Human and Material
- Academic Leadership practices

SECTION – B

ACADEMIC STANDARDS

Please provide your response against each statement by a tick (✓) in the appropriate box of your choice.

The corresponding values for each number in the scale of the agreement are:

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4– Agree 5 – Strongly Agree

	Statement/Opinion	1	2	3	4	5
Academic Enhancement Activities						
1.	Seminars are organised regularly for students on the current Mathematics Education trends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	International collaborative activities (e.g. Exchange programmes) are non-existent in my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Quizzes and other academically competitive activities are organised for students to test themselves with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Fresh students are given orientations on the do's and don'ts of the institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Pre-service teachers are allowed to evaluate the academic practices of Lecturers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Academic counselling activities are occasionally organised for students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Learning Environment						
7.	Lecturers maintain an excellent classroom environment for teaching and learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Student teacher-relationship is cordial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Collaborative learning is encouraged for students to help each other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Students are encouraged to ask questions during lessons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	School auditoriums are mostly rented out for non-academic activities, which makes the environment noisy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Security measures on campus are poor, encouraging encroachment by outsiders during	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	and after classes					
Learning Resources						
13.	Lecturers involve the appropriate learning materials in lessons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	The department has a library from which to learn.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	The appropriate teaching-learning materials are regularly used to enhance teaching and learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	Books in the Library are not current	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	The Wi-Fi on campus is not good enough, which makes accessing materials online difficult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	There is a computer laboratory, well stocked with computers and made accessible to students all the time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching Learning Process						
19.	Assessment methods are fair and free of bias towards individuals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	Lecturers promptly provide feedback to students in all situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Lecturers have good knowledge in their areas of specialisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	Course objectives are clearly stated and communicated at the beginning of every academic year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	Lecturers are regularly supervised to ensure the right practices are being used for academic activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	Evaluation processes (Examinations) are relaxed without strict supervision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	Students have the liberty to attend classes when and how they want	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.	Extra-curricular activities are given equal priority as academic activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadership and Governance						
27.	Good practices are rewarded to encourage repetition and to serve as an example for others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.	The Department ensure that the academic standards of graduating students are top notch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29.	Authorities respond promptly to pre-service teachers' agitations about academic issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.	Authorities rarely meet with students to discuss their challenges to offer solutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31.	Authorities are unwelcoming and difficult to approach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.	Students are involved in decisions involving students through the Student Representatives Council (SRC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION - C

CURRICULUM DESIGN, DEVELOPMENT AND IMPLEMENTATION

Please provide your response against each statement by a tick (✓) in the appropriate box of your choice.

The corresponding values for each number in the scale of the agreement are:

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4– Agree 5 – Strongly Agree

	Statement/Opinion	1	2	3	4	5
Design						
1.	The curriculum is clearly written with its objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	The curriculum meets international standards by comparison	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Although an integrated education programme, the curriculum content covers enough content knowledge to enable further studies in pure Mathematical-related areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Pedagogical content knowledge is emphasised to equip students with enough skills for classroom delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Evaluation procedures and their purposes are spelt out in the curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	The curriculum's coverage is enough for classroom practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	The content of the curriculum is outdated, it does not address current trends in Mathematics Education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	The curriculum is well organised concerning time frame, evaluation and materials for implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	The objectives of the curriculum concentrate on the intended skills to be achieved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	The constituents of the curriculum are in accordance with its objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	The role of Lecturers and pre-service teachers are not spelt out in the curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12.	The curriculum is not crowded. Pedagogical knowledge, pedagogical content knowledge, and content knowledge do not suffer because of this	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development						
13.	Students are allowed to evaluate portions of the curriculum for updating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Portions of the curriculum are updated occasionally based on current issues in Mathematics Education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	The curriculum has evolved to mimic the international standard with time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	The curriculum is diverse and inclusive of all students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	There is no evidence that the curriculum has been researched, analysed, and evaluated for updating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	The curriculum inspires engaging learning with questioning, analysing, synthesising, and deeper levels of knowledge and understanding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	The same curriculum has been used over a long period by comparison with the previous years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementation						
20.	Lecturers use the right materials during classroom transactions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Lectures are knowledgeable about the implementation processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	There is the right environment for curriculum implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	The curriculum provides no provisions for ICT integration in all of its aspects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	The institution has the necessary facilities to promote curriculum transaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	Evaluation procedures and practices are fair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.	Curriculum transactions do not encourage participation in class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION – D

Research Objective: 3: To study the learning culture in the Mathematics Education Programs of Ghana’s Teacher Education Universities.

LEARNING CULTURE IN THE MATHEMATICS EDUCATION PROGRAMMES IN GHANA’S TEACHER EDUCATION UNIVERSITIES

Please Provide Your Response against each statement by a tick (√) in the appropriate box of your choice.

The corresponding values for each number in the scale of the agreement are:

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4– Agree 5 – Strongly Agree

	Statement/Opinion	1	2	3	4	5
Before Class						
1.	The institution has a conducive teaching-learning environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Students never discuss concepts in groups before class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Lecturers report early to class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Students visit the library before class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Lecturers hardly recommend reading materials before lessons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
During Class						
7.	Lecturers encourage students to evaluate their learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Activities for an academic semester are followed as communicated at the beginning of the semester	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Objectives of lessons are not communicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Teacher Educators invest time in discussing students’ performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Computer labs are regularly made available to students for ICT integration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Lecturers are competent in the achievement of programmes objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Lecturers teach with less passion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Students collaborate during academic activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Lecturers invite staff from other departments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	during interdisciplinary activities					
After Class						
16.	There is enough administrative personnel to meet the academic needs of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	Lecturers make themselves available to assist students with their academic challenges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	Feedback on assignments and quizzes delay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Students are mostly loaded with assignments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	There are enough Lecturers to meet the academic needs of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Students and Lecturers have cordial relationships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	Group discussion is discouraged after lessons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	Students learn more outside the classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
During Examinations						
24.	Students are advised to learn for professional development rather than for examination marks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	Evaluation activities are mostly valid and measure students' performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.	Examinations are organised in a somewhat intimidating environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.	Assessments criteria and timings are not communicated earlier to enhance students' preparation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.	Programme objectives are considered in the evaluation of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.	Evaluation procedures are of different forms to meet all programme objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.	Students have a fear of failure in examinations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION – E

CHALLENGES ENCOUNTERED IN TRAINING PRE-SERVICE MATHEMATICS TEACHERS

Research Objective: To identify the challenges encountered in training pre-service Mathematics teachers in Teacher Education Universities.

Please Provide Your Response against each statement by a tick (√) in the appropriate box of your choice.

The corresponding values for each number in the scale of the agreement are:

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4– Agree 5 – Strongly Agree

	Statement/Opinion	1	2	3	4	5
Academic Challenges						
1.	The institution does not have a conducive environment for teaching and learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Lecturers do not utilise the right teaching-learning materials to enhance concept understanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	There are not enough Lecturers in my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Lecturers are not knowledgeable enough to handle the programmes' courses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Evaluation of students is biased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	The curriculum content is not in agreement with the program's objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	It isn't easy securing a school for off-campus teaching practice (internship)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Supervision during internship on the side of mentors (school practising teachers) is not effective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Mentors are not trained and struggle to assist students during their internship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	External supervision (supervision by institutional Lecturers) is not effective during internship (OCTP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Lecture hours are too lengthy. Students find it challenging to concentrate throughout lectures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Evaluation processes do not match the programmes' objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	There is a lack of cooperation with students from	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	other departments, which is a challenge to cross-disciplinary studies					
14.	Absenteeism on the part of Lecturers is on a high and disrupts academic activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Semester course outlines are mostly not completed due to disruptions such as strike actions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	Extra-curricular activities are discriminated against	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	There is discrimination towards some students based on factors such as denomination, ethnic group, religion, etc., on the part of some lecturers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Resource Challenges						
18.	Lecture halls are not spacious enough for all students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	There is no quality health facility for students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	The school library lacks current materials for referencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	The computer lab lacks enough computers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	There are not enough sports facilities in my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	The guidance and counselling centre is not functioning properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	My institution does not have a wireless internet facility for surfing the internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	My institution does not have enough residential facilities for students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Welfare Challenges						
26.	My institution's administration is not supportive of helping students secure schools for internship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.	The locals in the locality where my institution is are not friendly towards mathematics pre-service teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.	There is a lack of respect for students due to the low recognition attached to the teaching profession	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30.	The administration is not supportive concerning the needs of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic Challenges						
31.	Living expenditure in and around my institution is on the high side	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.	Accommodation is expensive in and around my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.	Securing accommodation on campus is difficult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.	Financial obligations towards the programme are on the high side	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.	Transportation in and around my institution is expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36.	The cost of food commodities is high in and around my institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION F

Research Objective: To suggest recommendations to improve the training process of the Mathematics Education Programs in the Teacher Education Universities of Ghana

RECOMMENDATIONS TO IMPROVE THE TRAINING PROCESS

Please suggest the necessary change that can be effected to improve the training of pre-service Mathematics teachers of the MEPs of the TEUs of Ghana.

Suggestions to improve the **Academic Standard** of the programme

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Suggestions to improve **Curriculum design, development and Implementation**

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Suggestions to improve the **Evaluation Methods/Practices**

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Suggestions for improvement regarding **Resources at the TEUs – Human and Material**

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Suggestions for improvement in the **Academic Leadership Practices**

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Suggestions to improve the **Learning Culture** of the programme

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Other suggestions to improve the training of pre-service teachers

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APENDIX D

Objective: To study the MEPs in the TEUs of Ghana with respect to: Curriculum design, development and implementation

Course:.....

Duration:.....

The scale of the checklist:

1=Not observed 2=More emphasis recommended 3=Accomplished very well

Classroom Observation Checklist

Introduction of Lesson				
		1	2	3
1.	Presented overview of the lesson.			
2.	The lesson was properly introduced.			
3.	Relevant previous knowledge was identified and swiftly revised.			
Presentation of Lesson				
4.	Major/minor points were explained.			
5.	Unfamiliar terms, concepts, and principles were explained.			
6.	Relevant practical examples were used to clarify concepts.			
7.	The right teaching-learning materials were used.			
9.	ICT was integrated in the teaching learning process.			
10.	Showed all relevant steps in the explanation of concepts.			
11.	Varied explanations were used for difficult concepts.			
12.	Active, collaborative, and cooperative learning favoured over passive learning.			
13.	Students were actively involved in the lesson.			
14.	The lesson was appropriately paced.			
15.	The lesson was presented in a logical sequence.			
16.	The lesson was related to relevant previous knowledge.			
17.	Major points were summarised.			
Interaction with Learners				
18.	The students were encouraged to ask questions			
19.	Questions were asked to monitor students' understanding.			
20.	The Teacher Educator carefully listened to students' questions.			
21.	Student questions were appropriately answered			
22.	When necessary, questions and answers were repeated.			
23.	Demonstrates respect for diversity and requires similar respect in the classroom			

Content Knowledge and Relevance				
24.	The lesson was at the appropriate level for students.			
25.	Presented appropriate materials as per the needs of the programme			
26.	Demonstrated command of the subject matter			
Lesson Assessment				
27.	The teacher educator assessed the lesson after teaching			
29.	Assessments measured the objective of the lesson.			
31.	Pre-service teachers were given assignments after the lesson			

Resources Checklist (Human and Material)

Institution name:

Resource Person:

Time:

Serial No.	Resource (Human and Material)	Availability		Quantity	Adequacy			Remarks
		Yes	No		Less	Adequate	More	
Human Resource								
<i>Teaching Staff</i>								
1.	Teachers Educators							
2.	(a). Male							
3.	(b). Female							
<i>Administrative Staff</i>								
4.	Head of department							
5.	Administrator (s)							
6.	Departmental office workers							
<i>Support Staff</i>								
7.	Academic advisor(s)							
8.	Lab assistant (s)							
9.	Teaching assistant(s)							
10.	Department Liberian (s)							

Other Human Resource not Mentioned

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Material Resource

Serial No.	Resource	Available		Quantity	Adequacy			Remarks
		Yes	No		less	adequate	more	
		<i>Infrastructure facility</i>						
1.	Lecture hall(s)							
2.	Computer laboratories							
3.	Sanitation facilities							
4.	Mathematics laboratories							
5.	Departmental Libraries							
6.	Seminar hall(s)							
7.	Teacher Educator Office(s)							
8.	Health facilities							
9.	Examination centres							
10.	Counselling Centre							
11.	Career support centre							
12.	Sports facilities							
<i>Learning Resources</i>								
13.	Computer(s)							
14.	Internet facility							
15.	Projector(s)							
16.	Smart boards							
17.	Lecture hall desk							
18.	Teaching-learning materials							
19.	Library journal subscription(s)							
20.	Library books							
<i>Student Amenities</i>								
21.	Student residential facilities							
22.	Recreational centres							
23.	Students canteen							
24.	Convention centre							
25.	Transport facility							
26.	Book shop							
27.	Banking facility							
<i>Staff Welfare facilities</i>								
28.	Staff residential facilities							
29.	Staff welfare							
30.	Loan facilities							

31.	Medical care							
32.	Educational facility for employees							
33.	Housing benefits							

Other available resources

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APPENDIX F

Observation Checklist for Learning Culture

Objective: To study the learning culture in the MEPS of Ghana's TEUs.

The scale of the checklist: Not Observer = 1, Rarely Observed = 2, Sometimes Observed = 3, Often Observed = 4, Always Observed = 5

Serial No.	Statement	1	2	3	4	5
Before Class						
1	Students go to lectures on time					
2	Teacher educators go to class on time					
3	There is a conducive environment for teaching and learning					
4	Students engage in discussions before lessons					
5	There is cooperation among students					
During Class						
6	Students engage in group discussion					
7	Appropriate teaching and learning strategies are used to achieve the objectives of lessons					
8	Teacher educator invited another colleagues to help with a class					
9	Teacher educators exhibit a social concern					
10	Teacher educators involve students in classroom activities					
11	Teacher educators encourage cooperation among students					
12	There is a cordial and professional relationship between pre-service teachers and teacher educators					
13	There are adequate opportunities for students to engage in active learning					
After Class						
14	Students have a good rapport with students from other departments					
15	Students visit the library regularly					
16	Students meet after class for group discussion					
17	Co-curricular activities are given equal importance					
18	Students can approach teacher educators for assistance					
19	Students of different departments collaborate in academic work					
20	All students respect the diversity of fellow members in the institution (gender, race, culture, language, ethnicity, etc.)					
21	Students learn more outside the classrooms					

Interview Schedule for Heads of Department

Opening

- A. My name is Francis Ennin, a research scholar from the Maharaja Sayajirao University of Baroda, Gujarat, India, conducting a study titled “A study on the Mathematics Education Programs in the TEUs of Ghana”.
- B. I would like to ask some questions on the “Purpose, Present Status and Future Directions” and “curriculum design, development and implementation” of the MEP of your institution as the head of the department in charge of this program.
- C. I hope to use this information for my study. Information from this interview will be strictly used for research purposes. The participant’s name and institution will not be mentioned anywhere in the analyses of the information from this interview.
- D. The interview should take about 20 minutes. Please, are you available to respond to some questions at this time?

(Transition: Let me begin by asking you some questions about your background and education)

Body

A. General demographic information of Respondent

1. What is your name?
2. What is your highest qualification?
3. Please can you give a brief description of your educational journey to this level?
 - (i). Basic Education
 - (ii). Senior High Education
 - (iii). Tertiary Education
4. How many years have you been in the education sector?
5. How many years have you been a Mathematics teacher educator?
6. How long have you been the Head of Department?

B. To study the MEPs in the TEUs of Ghana with respect to: Curriculum design, development and Implementation of MEP

Curriculum design

1. How is the design of the curriculum of the Mathematics Education programme planned?
2. How is the design process executed?
2. Which people are involved in the design process?
3. What are the key concepts addressed in the curriculum?
4. What are the key skills stipulated by the curriculum to be exhibited by graduates?
5. What are the priority quality standards for the programme?
6. What soft skills do students need to succeed in the programme?
7. Are international standards considered in the design process?
10. Does the curriculum address how to measure students understanding?
11. What type of assessment is outlined by the curriculum?
12. How does the curriculum address teaching for transfer?
13. Does the curriculum address situations where students don't learn?
14. Does the curriculum provide avenues for analysing career readiness indicators?
 - (ii) What roles are outlined for supporting career readiness?

Development

1. Does the curriculum have provisions for addressing gaps in its content?
2. Are there planned schedules for curriculum evaluation?
3. Is the curriculum compared to other international standards for improvement?
4. Is a particular body (e.g., curriculum development committee) constituted for the curriculums' development?

5. How often is the curriculum updated?
6. Does the curriculum provide provisions for how the update should be done?

Implementation

1. Does the curriculum outline implementation procedures?
2. Are there opportunities for student-led lessons, or do the program's curriculum and teacher educators dictate every lesson?
3. How does the curriculum cater for the 4Cs (Critical Thinking, Collaboration, Communication, and Creativity) in instructions and assessment(s)?
4. Does the curriculum support technology integration?
5. What measures are in place to support technology integration?
6. How will it be ensured that these standards are emphasised throughout the year?
7. Have will teachers and administrators unpacked the standards?
8. How will the soft skills be taught?
9. Do teachers have the opportunity to provide ongoing feedback regarding the school curriculum?
10. Does the curriculum stipulates meetings by teacher educators to discuss teaching and learning?

C. To study the MEPs in the TEUs of Ghana with respect to their purpose, present status, and future direction.

Purpose

1. What are the objectives of the program?
2. What are the expectations for the program's graduates?
3. What is the target group of the program?
4. Nationally, what challenge is the program designed to address?
5. Are there any research recommendations backing the program's design?

6. Was the programme designed to cater for a particular challenge within the education system of Ghana?

Present Status

1. How are the programs' graduates performing?
2. Is there satisfaction with the output of the program?
3. Has the program achieved its objectives?
4. How will you rank the program among similar programs in Ghana?
5. How does the program compare with other similar international programs?
6. Are global perspectives incorporated into the programme?
7. Are graduates of the programme employable?
8. Does the department have a means of tracking the employability status of graduates of the programme?
8. Is the program affordable for students?

Future Direction

1. Which changes have been effected recently to broaden the program's scope?
2. Is the program on continues upgrading to meet international standards?
3. What are the future prospects of the program?
4. Has the program been recently updated based on added or modified objectives?
13. What is the expectation for the program in the next five years?
14. Is there any plans to improve the international recognition of the program?
15. Is the programme sustainable?
16. What measures have been put in place to make the programme sustainable?
17. How flexible is the programme towards the needs of students?

Interview Schedule for Teacher Educators

Opening

- A. My name is Francis Ennin, a research scholar from the Maharaja Sayajirao University of Baroda, Gujarat, India, conducting a study titled "A study on the Mathematics Education Programs in the TEUs of Ghana".
- B. As a teacher educator of the department, I would like to ask you some questions on the "Purpose, Present Status and Future Directions" of your institution's MEP.
- C. I hope to use this information for my study. Information from this interview will be strictly used for research purposes. The participant's name and institution will not be mentioned anywhere in the analyses of the information from this interview.
- D. The interview should take about 30 minutes. Are you available to respond to some questions at this time?

(Transition: Let me begin by asking you some questions about your background and education)

Body

A. General demographic information of Respondent

1. What is your name?
2. What is your highest qualification?
3. Please can you give a brief description of your educational journey to this level?
 - (i). Basic Education
 - (ii). Senior High Education
 - (iii). Tertiary Education
4. How many years have you been in the education sector?
5. How many years have you been a Mathematics teacher educator?

C. To study the MEPs in the TEUs of Ghana with respect to their purpose, present status, and future direction.

Purpose

1. What are the objectives of the programme?
2. What are the expectations for the programme's graduates?
3. What is the target group of the program?
4. Nationally, what challenge is the program designed to address?
5. Are there any research recommendations backing the programme's design?
6. Was the programme designed to cater to a particular challenge within Ghana's education system?

Present Status

1. How are the programmes' graduates performing?
2. Is there satisfaction with the output of the program?
3. Has the program achieved its objectives?
4. How will you rank the program among similar programs in Ghana?
5. How does the program compare with other similar international programs?
6. Are global perspectives incorporated into the programme?
7. Are graduates of the programme employable?
8. Does the department have a means of tracking the employability status of graduates of the programme?
8. Is the program affordable for students?

Future Direction

1. Which changes have been effected recently to broaden the program's scope?
2. Is the program continuously upgrading to meet international standards?
3. What are the future prospects of the program?

4. Has the program been recently updated based on added or modified objectives?
13. What is the expectation for the program in the next five years?
14. Are there any plans to improve the program's international recognition?
15. Is the programme sustainable?
16. What measures have been put in place to make the programme sustainable?
17. How flexible is the programme towards the needs of students?

Interview Schedule for Pre-Service Teachers

Opening

- A. My name is Francis Ennin, a research scholar from the Maharaja Sayajirao University of Baroda, Gujarat, India, conducting a study titled “A study on the Mathematics Education Programs in the Teacher Education University of Ghana”.
- B. I would like to ask some questions about the “Evaluation Procedures” of the MEP of your institution.
- C. I hope to use this information for my study. Information from this interview will be strictly used for research purposes. The participant’s name and institution will not be mentioned anywhere in the analyses of the information from this interview.
- D. The interview should take about 20 minutes. Please, are you available to respond to some questions at this time?

(Transition: Let me begin by asking you some questions about your background and education)

Body

Objective: To study the MEPs in the TEUs of Ghana with respect to: Evaluation Procedures of the MEPs

General Knowledge and Perceptions of the Evaluation Procedures

1. What is your understanding of the word “Evaluation”?
2. Are you told how courses will be evaluated at the beginning of the semester?
3. Are you made aware of the specific skill being evaluated?
4. What type of assessment is practised?
5. Are the assessment processes devoid of biases?
6. Does the questions reflect what is taught during lectures?
7. Are the assessment processes measuring the objectives of the courses?

8. Is the assessment process towards the objectives of the program?
9. Does your grades reflect your perceived input during examinations?
14. In your opinion, are the assessment practices beneficial to students' academic development?
15. How often are you assessed on a particular course?
12. Does your grades reflect your perceived input during examinations?
13. Have you ever considered challenging your grades in a particular course?

Internal Assessment

14. Who organizes internal assessments for various courses?
15. Does internal assessment measure the objectives of the course?
16. How often are internal assessments organized for a course in a semester?
18. In what mode are internal assessments organized?
19. Have you been receiving rapid feedback on internal assessments?
20. Are you satisfied with the outcomes of internal assessments?

External Assessment

21. Who organizes external examinations?
22. What is your satisfaction concerning the difficulty level of external examinations?
23. Are you satisfied with the organization of external examinations?
24. Have there been malpractice issues before, during and after external examinations?
25. How does the University handle malpractice issues before, during and after examinations?
26. Do the outcomes of external examinations reflect your expectation?
27. Does lectures and examinations complement each other?
28. The examinations measure knowledge of the course material?

Off-Campus Teaching Practice Assessment

29. How were you assessed during “off-campus teaching practice”?
30. Which people are involved in the “off-campus teaching practice” assessment process?
31. How often did your internal supervisor (Mentor) visit your class?
32. How many times did your mentor discuss lessons with you?
33. How many times did your external supervisor visit for an assessment?
34. Will you say the assessment of the OCTP was adequate? If yes, why?