PROFESSIONAL DEVELOPMENT PROGRAMME

THEME 8

The Tutor as a Researcher

PROFESSIONAL DEVELOPMENT GUIDE FOR **TUTORS**

NATIONAL TEACHING COUNCIL
NTC
Building Confidence, Raising Teaching Standards

Transforming Teacher Education and Learning

T-TEL
Transforming Teacher Education and Learning

THEME 8: THE TUTOR AS A RESEARCHER

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The Government of Ghana

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FOREWORD

The origins of Theme 8 can be traced back to the request of tutors of colleges of education to have an opportunity to explore different ways in which to support trainee teachers to enhance learners' knowledge and skills through action research.

For anyone interested in knowing more about action research, the units in this book should prove very illuminating. I believe tutors will find both the concepts and potential of action research in the various units cover very appealing, regardless of the subject they teach.

On the basis of the diverse examples presented in Theme 8, it is clear that there is no one model of action research, albeit the theme has highlighted a specific action research cycle. Indeed, the theme provides good examples of both how action research has been used to address students' learning needs, and how tutors can continue to use the approach in their practice.

Apart from the specific examples provided by the authors, the theme presents action research as a powerful tool for encouraging tutors to experiment with different approaches to teaching and learning in order to identify which approaches best work for them and their students.

It is the hope of the Tutor Professional Development (TPD) team that tutors will continue to use action research and that they will try some of the approaches suggested in the book.

Professor Jonathan Fletcher
Key Adviser, TPD & School Partnerships

[1] T-TEL (2017) T-TEL Midline Survey Report August 2017. JMK: Accra

INTRODUCTION

We begin this session with an overview of Theme 8 as follows:

Overview of the Theme (10 Minutes)

The purpose of Theme 8, "The Tutor as a Researcher", is to enable you to appreciate research, especially classroom action research, as a means of enhancing teaching, learning and assisting your students to conduct action research. Theme 7, "Assessing Trainee Teachers", introduced you to changes in assessment of teacher trainees outlined in the National Teachers' Standards (NTS) and the National Teacher Education Curriculum Framework (NTECF). The changes include portfolio assessment. Included in the portfolio assessment is the reflection on the practice of the individual teacher, action research, classroom enquiry and child studies. Tutors are required to publish as part of the requirements for their promotion. Theme 8 introduces key aspects of what is needed to enable you to become a practitioner and a researcher at the same time (Rust & Clark, n.d.).

Learning Objectives of Theme 8

By the end of Theme 8, tutors would be able to:

- Apply the steps of the action research cycle for a small-scale enquiry by
  - ◊ using critical reflection to identify an area for enquiry
  - ◊ collecting and undertaking qualitative analysis of data
  - ◊ diagnosing issues and drawing implications for practice
  - ◊ taking action.
- Gain a greater understanding of the trainees as learners and use this to identify ways to improve their practice.
- Develop and revise course outlines.
- Support trainees to become reflective practitioners and undertake classroom enquiry.
- Develop competency to write for publication.

Theme 8 is made up of the following units:

Unit 1: Reflective Practice: Problematising – including the what and why of classroom focused action research.

Unit 2: The action research cycle, steps to action research using and interpreting Susman's (1983) action cycle.

Unit 3: Doing classroom action research, analysing and making sense of qualitative data and triangulation.

Unit 4: Using action research to improve your practice: diagnosis – what the data says – and implications for practice.

Unit 5: Using action research, intervention to redesign course outlines to strengthen trainee learning and progress: key concepts and expectations, Initial Teacher Education (ITE) pedagogy, ITE assessment for, and of, learning (drawing on previous themes).

Unit 6: Using action research, intervention: developing course outlines based on action research.

Unit 7: Writing for publication: audience, style and purpose.

Unit 8: Reflecting on and reviewing Theme 8 and next steps to curriculum reform.

UNIT 1: REFLECTIVE PRACTICE

Learning Outcomes (5 minutes)
By the end of this unit tutors would be able to:
1. Explain reflective practice.
2. Build a sample of a reflective log.
3. Identify areas of trainees' learning which they would like to strengthen.

INTRODUCTION

Every individual needs to reflect on every aspect of his/her life. The ability to reflect is a valuable part of human life, for as Plato says, 'the un-reflected life is not worth living' (Plato in Taylor, 2000, p10). For the teacher then, critical daily reflection on his/her lesson is essential because through reflection, he/she can identify areas in need of attention and ways to improve the quality of their work (Ackummey & Kankam, 2010; Essuman & Asante, 2010).

Activity 1: Brainstorm – whole class (10 minutes)

Activity 2: Group work (50 minutes)

You were asked to prepare a lesson you would teach at PDS for 20 minutes.
a. In your departments, select and finalise one of your plans and nominate one member to get ready to teach. Your representative may be selected by the PDC to teach for 20 minutes.
b. Observe the lesson and make notes.
c. Reflect using the guidelines provided (Annexe 1.2) as follows:
    - ◊ The one who taught should reflect on the lesson he/she taught.
    - ◊ All others should reflect on any recent lesson you have taught.
d. Record your reflection in the reflective log provided (Annexe 1.3) and be ready to read from your reflective log for comments.

Activity 3: Benefits of recording tutor reflections over time (10 minutes)

In your groups, answer the following:
1. What are the benefits of recording your reflections over time?
2. What areas of trainees' learning would you like to strengthen from your classroom reflections?
3. Suggest various ways of strengthening those areas. Use Annexe 1.4 as a guide.

REFLECTION (5 MINUTES)

Reflection is an active process of evaluating one's own practice and devising strategies for making things better (Schon, 1983). Through reflection, you will identify ways to improve the quality of your work. It is the beginning of the action research process. Try reflecting on your lessons and record your reflections for the next session.

1. What will you do to show that you reflect on your classroom practice?

Write down one or two learning needs of your trainees which you see as areas you would like to improve through further exploration / action research to enable you to design an action research.

INTER-UNIT ACTIVITY

Before the next PDS, read Unit 2, especially Annexes 2.1 and 2.2 on action research.

MATERIALS FOR UNIT 2:

Bring along your reflective logs and the learning need(s) you have identified.

UNIT 1 - ANNEXES

ANNEXE 1.1: REFLECTIVE PRACTICE

Reflective practice is a way of looking at your day-to-day activities or experience with an open mind. Reflection is an active process of evaluating one's own practice and devising strategies of making things better (Schon, 1983).

Reflective practice in teaching involves looking back and evaluating your teaching experiences. It is the process of witnessing your own teaching experience in order to take a closer look at it. Through reflection, teachers can identify ways to improve the quality of their work.

ANNEXE 1.2: GUIDELINES FOR REFLECTION

Step 1: A Description of the Event

Write a description of the teaching experience using the following questions as a guide:

- What was I trying to achieve?
- What did I do?
- What were the effects of what I did (or did not do)?

Step 2: Analysis and Interpretation of the Event

Write your analysis. Some of the following questions might help you to analyse the event:

- Why do I think things happened the way they did?
- Why did I choose to act the way I did?
- Why did I respond as I did and how did I feel in this situation?
- How did my actions match my beliefs?
- How might the context have influenced the experience?
- What did I do effectively?

Step 3: Meaning and Application

Being able to describe something and find out why it happened that way is not enough to improve your teaching. You need to see the overall meaning of events in order to use them to improve your practice. You may consider the following questions at this stage:

- What were the essential strengths of the lesson?
- What did I do that was not effective?
- Where do I need improvement as a teacher?
- What are some other ways to present the lesson which would be just as effective or more effective?
- What have I learned from this?
- How could I improve?
- How might this change my teaching in future?

Step 4: Implications for Action

At this stage, reflection moves into action planning. The most powerful reflection focuses on student learning, i.e. on how you will vary your teaching to improve learning for your students.

- What will I do differently? (Can you think of another way you might have taught this lesson?)
- How can I modify my teaching if a similar situation were to happen again?
- What help do I need to enable me to act on the results of my reflection?

ANNEXE 1.3: REFLECTIVE LOG TEMPLATE

REFLECTIVE LOG FORM			
Name:		**College:**	
Subject:			
Topic:			
Class:			

1.a What were the essential strengths / weaknesses of the lesson?
1.b What were the weaknesses

2. How did the way you taught the lesson match your beliefs about teaching and learning (your personal philosophy)?

3. Do you think the lesson was successful and if so, why? If not, why not?

4. Which conditions were important to the outcomes?

5. What unanticipated learning outcomes resulted from the lesson?

6. Can you think of another way you might have taught this lesson?

7. Do you think the content covered was important to students? Why / Why not?

8. What did you learn from the lesson?

ANNEXE 1.4: SAMPLE COMPLETED REFLECTIVE LOG FORM

REFLECTIVE LOG FORM			
Name:	Obrafo Esther	College:	Sikabeyede Cluster of Schools
Subject:	Home Economics		
Topic:	Nutrition and Health		
Class:	JHS 1		

1.a What were the essential strengths / weaknesses of the lesson?
1.b What were the weaknesses

a. Very audible
b. Even distribution of questions, used both high and low order questions
c. Gave rewards (good, very good, etc.) accordingly to motivate students
d. Used TLM and realia effectively

2. How did the way you taught the lesson match your beliefs about teaching and learning (your personal philosophy)?

I taught students by assisting them to understand the concepts. I gave them relevant tasks. I asked more questions so they could express their views. I served as a coach because they did most of the work, and I only facilitated learning.

3. Do you think the lesson was successful and if so, why? If not, why not?

Lesson was successful because students developed more interest in the lesson. They were actively involved. They were able to produce appropriate volume and quality of work for assessment. Above all, they achieved the learning outcomes.

4. Which conditions were important to the outcomes?

Good introduction, systematic presentation of lesson, effective use of TLM, good demonstration and appropriate tasks for assessment for, and of, learning.

5. What unanticipated learning outcomes resulted from the lesson?

In the process of teaching, I asked a student to explain the term “dish” in home economics. He ended up talking about gifts which had no relation with the day’s lesson. The student learned from this ‘deviation’ in the end as she gave good examples of dishes.

6. Can you think of another way you might have taught this lesson?

I would bring to class various ingredients and demonstrate the preparation of different dishes.

7. Do you think the content covered was important to students? Why / Why not?

Yes. The content informed them about what foods are good for their health.

8. What did you learn from the lesson?

Using a variety of TLMs and methods helps to make abstract concepts real and meaningful to students.

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UNIT 2: THE ACTION RESEARCH CYCLE

Learning Outcomes
By the end of this unit tutors would be able to:
1. Explain the action research cycle.
2. Identify and discuss methods of data collection in action research.

Revision Activity: Brainstorming (10 minutes)

INTRODUCTION (5 MINUTES)

The goal of action research is to understand some elements of your classroom through data collection, analysis and interpretation to improve specific aspects of practice. Lewin (1964) describes action research as a comparative research on the conditions and effects of various actions leading to social action that uses a *spiral of steps, each of which is composed of planning, action and fact finding about the result of the action.*

It is important to note that the number of steps (spirals) you may go through in the process of conducting action research could vary from one study area to the other; there could be three, four, five or more steps in the action research cycle. It is therefore important to indicate that one should not necessarily be tied rigidly to a particular model (see Kolb, 1984). The whole action research programme can be seen as one huge action research cycle and literally starts where you are and will take you as far as you want to go. Essentially, action research is an excellent process of testing, observing, thinking, changing to improve teaching and learning (Yan, 2017).

In collecting the data in action research, the researcher / teacher must decide what to know more about and change; this will determine each of the following:
- Which data to collect
- How to collect the data
- Who is to collect the data
- When to collect the data.

The discussion in this unit will centre mostly on understanding what action research is, the steps in conducting the action research project and methods of collecting data for the research.

Activity 1: Sharing Knowledge and Experience on Action Research Cycle

Activity 1a (15 minutes)

- Identify another tutor and share with him/her your knowledge and experience on the steps you go through when conducting action research.
- Share your experience with the larger group for a whole class discussion.

Activity 1b (15 minutes)

In your pairs:

- Discuss Susman's (1983) steps and the purpose of each step.
- Compare the steps of the action research cycle you identified and discussed in Activity 1a with the steps presented in the chart.
- Identify aspects of action research you need to know more about. (Refer to Susman's (1983) Action Research Cycle in Annexe 2.1).
- Share your responses for a whole class discussion.

Activity 2: Methods of Data Collection for Action Research (15 minutes)

Using Table 1 below as an example:

- Describe a learning need of your students that you have recorded in your reflective log.
- Indicate the method(s) you used in identifying the learning need.

Table 1: Data Collection Methods for Learning Needs

Learning Need	Data Collection Method
Example: Student having difficulty in identifying the relationship between a fraction and a ratio	Class exercise

Activity 3: Designing an Action Research Project (25 minutes)

- Using Susman's action research cycle (Annexe 2.1) as a guide, design a small-scale action research project to address the need you identified in Activity 2.
- Write out your agreed responses on a flip chart, display your work on the wall and have a gallery walk.
- Note any issues for discussion.

REFLECTION (5 MINUTES)

The goal of action research is to enable the practitioner to bring about an improvement in their own practice (Birley & Moreland, 1998).

- What might the impact of action research be on your classroom practice?

INTER-UNIT ACTIVITY

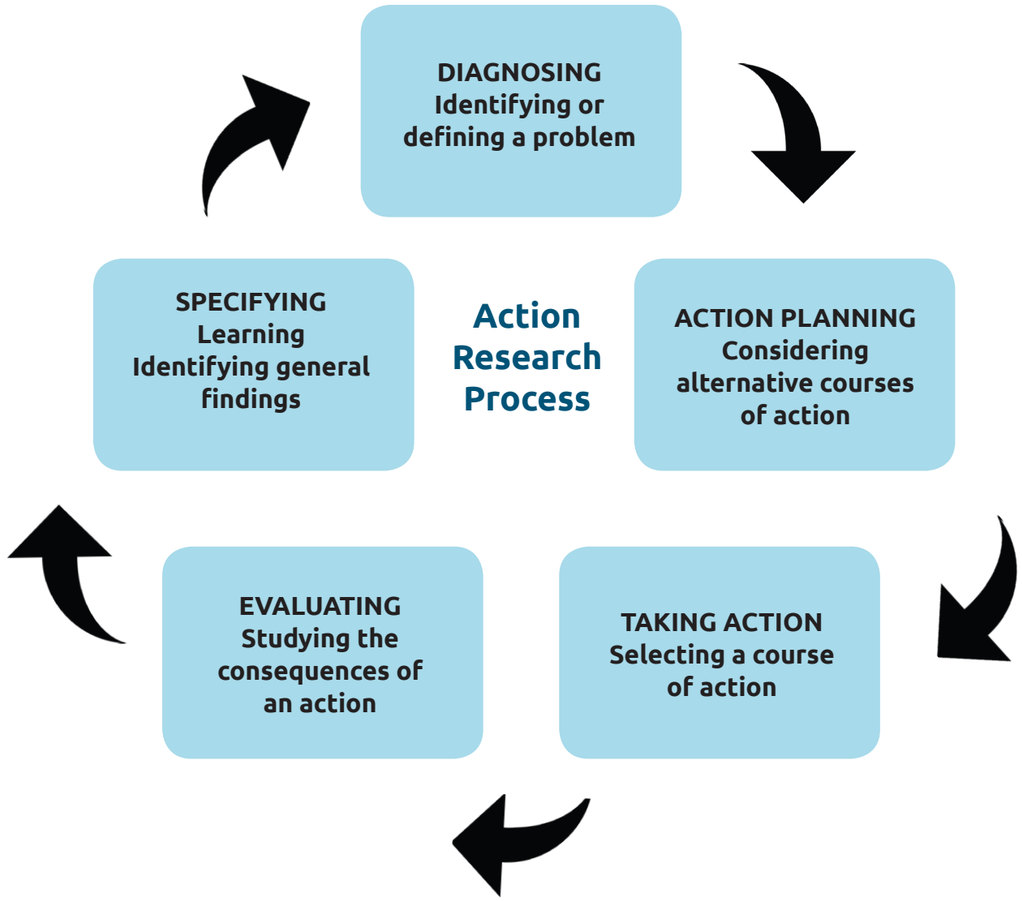
In preparation for Unit 3, bring along the learning needs of trainee teachers discussed in Activity 2.

MATERIALS FOR UNIT 3:

- PDCs and tutors are to come with their own qualitative data from their subject areas to be used in Unit 3
- Crayons or coloured pencils

UNIT 2 - ANNEXES

ANNEXE 2.1 SUSMAN'S ACTION RESEARCH CYCLE



Susman's Action Research Cycle

Diagnosing

Reflecting on your everyday teaching can help you perceive a problem. You then have to use data collecting mechanisms such as class exercises, quizzes and tests, observations and interviews to convince yourself that the problem exists. Teachers often have several questions they wish to investigate; however, it is important to limit the questions to one that is meaningful and doable in the confines of their daily work. Important considerations in choosing a question to ask and investigate are whether it is something over which the teacher has influence, something of interest and whether it is worth the teacher's time.

Action Planning

This is the time you consider the interventions you want to use to bring about the change, the formulation of your topic for the research and the purpose of the research. The most important outcome of the planning phase is a detailed plan of the action you intend to take or the change you intend to make. Who is going to do what, and by when? What are the proposed changes to the curriculum or course outline? How do you intend to implement your revised teaching strategies? It is important to try to work out whether your plans are practicable and to consider how others might react to their implementation. You also need to make plans for observation or monitoring your proposed changes.

Taking Action

Implementation of the project itself (over varying periods of time): it will include the methods of data collection, the monitoring of tasks and the transmission of feedback to the research team and the classification and analysis of data.

Evaluating

Detailed observation, monitoring and recording enables the teacher to assess the effect of his/her action or intervention and hence the effectiveness of the proposed change. Evaluation considers the effects of your intervention to determine whether improvement has occurred. If there is improvement, do the data provide supporting evidence? If not, what changes can be made to elicit better results? Additional questions raised during the action research help to plan for additional improvements or revisions.

Specify Learning

At the end of an action cycle it is particularly important to reflect critically on what has happened using the observations and notes made in diaries. How effective were your changes? What have you learnt? What were the barriers to change? How can you improve the changes you are trying to make in future?

ACTION RESEARCH AND CLASSROOM PRACTICE

Nature of Action Research

Action Research uses “a spiral of steps”, each of which is “composed of a circle of planning, action and fact-finding about the result of the action”. Also discussing about action research, Carr and Kemmis [3] pay much attention to the purposes of action research when they define it as “a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices and the situations in which the practices are carried out”. On the other hand, looking at the nature of action research, O’Brien [4] asserts that although action research has been referred to by different names such as participatory research, collaborative enquiry, emancipatory research, action learning or contextual action research, it is truly understood as “learning by doing”, namely, a group of people encounter a problem; they do something to resolve it; they then see how successful their efforts are and if they are not satisfied with the result they can try it again.

Importance of Action Research to Teachers

Within education, the main goal of action research is to determine ways to enhance the lives of children (Mills, 2011). At the same time, action research can enhance the lives of those professionals who work within educational systems. To illustrate, action research has been directly linked to the professional growth and development of teachers (Hensen, 1996; Osterman & Kottkamp, 1993; Tomlinson, 1995).

According to Hensen, action research (a) helps teachers develop new knowledge directly related to their classrooms, (b) promotes reflective teaching and thinking, (c) expands teachers’ pedagogical repertoire, (d) puts teachers in charge of their craft, (e) reinforces the link between practice and student achievement, (f) fosters an openness toward new ideas and learning new things, and (g) gives teachers ownership of effective practices. Moreover, action research workshops can be used to replace traditional, ineffective teacher in-service training (Barone et al., 1996) as a means for professional development activities (Johnson, 2012).

Providing teachers with the necessary skills, knowledge, and focus to engage in meaningful enquiry about their professional practice will enhance this practice, and effect positive changes concerning the educative goals of the learning community. As a corollary to the professional growth opportunities offered to educators, action research also facilitates teacher empowerment (Johnson, 2012). In particular, teachers are empowered when they are able to collect and use data in making informed decisions about their own schools and classrooms (Book, 1996; Fueyo & Koorland, 1997; Hensen, 1996). Within the classroom, empowered teachers can implement practices that best meet the needs of their students, and complement their particular teaching philosophy and instructional style (Johnson, 2012). In exercising their individual talents, experiences and creative ideas within the classroom, teachers are empowered to make changes related to teaching and learning. By doing so, student achievement is enhanced (Marks & Louis, 1997; Sweetland & Hoy, 2002), and schools become more effective learning communities (Detert, Louis & Schroeder, 2001).

In short, it is possible to say that action research can be looked at as a professional development tool since it tries to enhance the capacity of teachers as generators of professional knowledge in contrast to enhancing their capacity to apply someone else’s knowledge.

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UNIT 3: DOING CLASSROOM BASED ACTION RESEARCH

Learning Outcomes
By the end of this unit tutors would be able to:
1. Identify challenges associated with qualitative data collection.
2. Identify alternative approaches to support triangulation in data collection.
3. Demonstrate how to use the principles of qualitative data analysis to analyse qualitative data.

Revision Activity (5 minutes)

The goal of action research is to enable the practitioner to bring about an improvement in their own practice (Birley & Moreland, 1998).
- What might be the impact of your action research on your classroom practice?
- Share your reflections with a colleague.

INTRODUCTION

In the previous unit we learned that action research is a cyclical and continual process where educators systematically reflect on their practice and make changes to their instructions, based on the findings aimed at improving their teaching practices (Costello, 2003). This unit aims at helping tutors to consolidate their knowledge of principles of qualitative data analysis, issues with qualitative data collection as well as the alternative approaches that would help them to triangulate and verify data they have already collected.

Activity 1: Identifying Challenges with Qualitative Data Collection (15 minutes)

In your groups, answer the following questions:
- What are some of the challenges you encountered when collecting the data which you brought to the PDS today?
- What accounted for the challenges you have listed?

Put your responses on a flipchart and share with other groups.

Activity 2: Using Alternative Approaches to Support Triangulation in Data Collection. (20 minutes)

Read the notes on triangulation in Annexe 3.1. In pairs, answer the following questions:
- What is triangulation?
- How did you triangulate the data you brought to the PDS today?
- What role did the triangulation play in your qualitative data analysis?

Share your responses in a whole class discussion.

Read the notes on triangulation in Annexe 3.1. In pairs, answer the following questions:

- What is triangulation?
- How did you triangulate the data you brought to the PDS today?
- What role did the triangulation play in your qualitative data analysis?

Share your responses in a whole class discussion.

Activity 3: Analysing Qualitative Data (45 minutes)

- In your groups select one set of the sets of data members of your group brought to the PDS today.
- Analyse the data you have selected by using the following steps:
  a. Show how you do the coding and categorisation.
  b. Indicate the methodology you have adopted.
  c. Interpret the results.
  d. Provide findings.

REFLECTION (5 MINUTES)

1. What principles did you use to analyse the data you collected in Unit 2?
2. In conducting action research, what are the challenges in qualitative data analysis?

INTER-UNIT ACTIVITY

Read Annexe 3.2 and reflect on the following for the next PDS:

a. You have successfully analysed your qualitative data. What is next?
b. What patterns can you identify in your data?
c. What are the implications of your results for your students' learning and your practice?

MATERIALS FOR UNIT 4:

Come along with the following:

- Any material on action research you have personally worked on.
- Findings from the data you already analysed.
- Subject group data that each group worked on during the coding exercise earlier.
- Review the concept maps in Theme 4.

UNIT 3 - ANNEXES

ANNEXE 3.1: CHALLENGES AND SOLUTIONS ASSOCIATED WITH QUALITATIVE RESEARCH

Challenges

Limited Sample Size

Sample size limits the amount of data one should collect. In fact, there is no general agreement on the ideal sample size for qualitative research. Unlike quantitative data however, where you often have a great amount of data available, sample sizes which limit the amount of data you have present a challenge to qualitative data regarding the amount of data to be collected. This can be solved if one does the following:

- Rule of thumb: you need more participants, if new participants keep on providing you with relevant, new insights.
- Be flexible; don't set a fixed number of participants at the start.

Sampling Bias

Sampling bias is a process of selecting a sample from a population in which some members of the population are less likely to be included than others.

Self-Selection Bias

Self-selection and sampling biases are closely related and limit the usefulness of qualitative data. It is a free choice to participate in a research study or not, unlike quantitative data gathering where data is gathered from most people whether they like it or not.

Observation Biases

This is also called the Hawthorne Effect. The Hawthorne Effect can best be demonstrated in behavioural studies, where participants change their behaviour or performance in response to being observed. For example, your participants will make a conscious effort to pronounce words correctly if they are aware that your target is to observe their pronunciation difficulty.

Observer-Expectancy Effect

It is known that researchers' beliefs or expectations cause them to unconsciously influence the participants of an experiment. This is called the observer-expectancy effect.

Artificial Scenario

Most experiments include pre-set goals in a specific environment, from which other potential goals are excluded. Therefore, feedback on certain aspects of this environment will neither be asked for nor obtained. For example, in an experiment on the influence of an element of Waali on English by Waali L2 learners, the goal could be to find out whether the participants indeed speak English with that element of Waali in it. As the goal is so specific in this case, it will not be possible to gain other valuable insights through this study. The participants might have a lot of other things to say, but without asking them, the researcher will not find out.

Solutions

One can solve these problems or challenges by doing one of the following:

Triangulation

This is a way of assuring the validity of research through the use of a variety of methods to collect data on the same topic. It involves different types of samples as well as methods of data collection. The main aim of triangulation is to gain a better understanding of an investigated phenomenon by viewing it from different perspectives. It does not necessarily mean cross-checking data from at least two sources or methods and confirming its correctness or otherwise. Its goal is more to increase the level of knowledge about something and to strengthen the researcher's standpoint from various perspectives, especially when setting and following the methodological framework of a research project. Generally, this should be practised as much as possible.

Use qualitative data in combination with quantitative data to form strong A/B test hypothesis.

Excerpts from Coffey, Holbrook and Atkinson (1996).

ANNEXE 3.2: ELEMENTS OF QUALITATIVE DATA

Qualitative Data Analysis (QDA) is the range of processes and procedures whereby we move from the qualitative data that have been collected to some form of explanation, understanding or interpretation of the people and situations we are investigating. QDA is usually based on an interpretative philosophy. Data analysis tools and software are typically used to sort through data in order to identify patterns and establish relationships.

QDA has the following key characteristics:

- Data are not easily reduced to numbers
- Data are related to concepts, opinions, values, and behaviours of people in a social context
- It analyses transcripts of individual interviews and focus groups, field notes from observation of certain activities, copies of documents, audio / video recordings.

Approaches in Analysing Qualitative Data

There are two main approaches in analysing qualitative data:

a. Deductive approach: uses research questions to group the data and look for similarities and differences.
b. Inductive approach: uses emergent framework to group the data and then look for relationships.

Five Principles of QDA:

a. People differ in their experiences and understanding of reality (constructivist – many meanings).
b. A social phenomenon can't be understood outside its own context (context-bound, i.e. book is in the pen).
c. Qualitative research can be used to describe a phenomenon or generate a theory grounded in data.
d. The understanding of human behaviour emerges slowly and non-linearly.
e. Cases may yield insight into a problem or new ideas for further points of focus in analysis.

Types of qualitative analysis

- Content analysis
- Narrative analysis
- Discourse analysis
- Framework analysis
- Grounded theory

CONTENT ANALYSIS

- Content analysis is the procedure for the categorisation of verbal or behavioural data for the purpose of classification, summarising and tabulation.
- The content can be analysed on two levels
    - ◊ Descriptive: what is the data?
    - ◊ Interpretative: what was meant by the data?

Narrative analysis

- Narratives are transcribed experiences.
- Every interview / observation has a narrative aspect which the researcher has to identify, reflect upon, enhance, and present in a revised form to the reader.
- The core activity in narrative analysis is to reformulate stories presented by people in different contexts and based on their different experiences.

Framework analysis

- Familiarisation: transcribing and reading the data.
- Identifying a thematic framework: initial coding framework which is developed both from a prior issue and from emergent issues.
- Coding: using numerical or textual codes to identify specific pieces of data which correspond to different frameworks (can be thematic or by case).
- Mapping and interpretation: searching for patterns, association, concepts and explanations in the data.

Discourse analysis

- A method of analysing a naturally occurring talk (spoken interaction) and all types of written texts.
- Focuses on how people shape and make sense of everyday social life: e.g., on how language is used in everyday situations.
    - ◊ Sometimes peoples express themselves in a simple and straightforward way
    - ◊ Sometimes people express themselves vaguely and indirectly
    - ◊ Analyst must refer to the context when interpreting the message, as the same phenomenon can be interpreted in a number of different ways, depending on the context.

Grounded theory

- Analytic induction
    - ◊ Starts with an examination of a single case from a 'pre-defined' population in order to formulate a general statement about a population, a concept or a hypothesis
    - ◊ Then the analyst examines another case to see whether it fits the statement
    - ◊ If it does, a further case is selected
    - ◊ If it doesn't fit, there are two options:
        - ◊ Either the statement is changed to fit both cases or the definition of the population is changed in such a way that the case is no longer a member of the newly defined population. Then another case is selected and the process continues. In this way, one should be able to arrive at a statement that fits all cases of a population as defined. This method is only suitable for a limited set of analytic problems, i.e. those that can be addressed by an overall statement.

Strategies for analysing observations

- Chronology: describing what was observed in chronological order to tell the story from the beginning to the end.
- Key events: describing critical incidents or major events, not necessarily in order of occurrence but in order of importance.
- Various settings: describing various places, sites, settings or locations in which events / behaviours of interest happen.
- People: describing individuals or groups involved in the events.
- Process: describing important processes (e.g. control, recruitment, decision-making, socialisation, communication).
- Illuminating key issues – how did participants change?

Excerpts from Creswell (2012).

Table 3.1: Qualitative data collection approaches

Types of Qualitative Data Collection Approaches

Method and description	Advantages	Disadvantages	Appropriate for these approaches
Structured Interviews: One-on-one interviews using on predetermined questions	Easy to administer; quick than other interviews	Does not allow for follow up or variation; may lack depth	Phenomenology; Grounded Theory; Ethnography; Case Study.
Structured Interviews: No standard set for questions, often used to explore an idea; can use open-ended questions	More in-depth; allows interviewer to follow up; less rigid; more ope responses	More time-consuming; less consistency in data collected	Narrative; Phenomenology; Ethnography; Case Study
Focus Groups: No standard set for questions, often used to explore an idea; can use open-ended questions	More time-effective; gather information from multiple people at once; provides social context	Group dynamics can sometimes interfere with accuracy of the data; may be intrusive	Grounded Theory; Ethnography; Case Study.
Direct Observation: Researcher gather first hand data on programs, process or behaviors through direct observation and note-taking	Can gain a holistic perspective by seeing full context; researcher can look for unexpected outcomes; occurs in the natural setting	Time-consuming; may effect behavior of participants; perceptions of observer influence the data; may be intrusive	Phenomenology; Ethnography; Case Study
Participant Observation: Researcher participates in activities rather than just observing ; active participation/observation	Active participation provides more complete understanding and context; may be more natural/less intrusive	May become too close the topic or to the people involved in the study; may lose objectivity	Ethnography; Case Study;
Written Documents: Researcher uses existing documents such as letters, memos, diaries, emails and so forth to study topic	May provide factual information otherwise not attainable if writers are deceased: inexpensive	May be subjected data from the point of view of the writer; may be difficult to verify validity; may find conflicting information	Narrative; Case Study
Artifacts: Researcher study items made/used by different societies and cultures that provide evidence of the past	Provides insight into how people lived, what they believed and valued, their knowledge and opinions	May be difficult to interpret meaning and use;needs to be analyzed in appropriate context; often used in conjunction with other methods	Narrative; Case Study

Adopted from Center for Innovation in Research and Teaching, Grand Canyon University. Arizona (https://cirt.gcu.edu/)

ANNEXE 3.3: QUALITATIVE ANALYSIS OF INTERVIEW DATA - A BASIC STEP-BY-STEP GUIDE

Step 1: Read the transcripts

- Quickly browse through all the transcripts as a whole.
- Make notes about your first impressions.
- Read the transcripts again one by one.

Step 2: Labeling relevant pieces

- Label relevant words, phrases, sentences and sections.
- Labelling can be about action, activities, concepts, differences, opinions, processes or whatever you think relevant.
- Something may be relevant to you because:
    - ◊ It is repeated several times
    - ◊ It surprises you
    - ◊ The interviewee explicitly states that it is important
    - ◊ You have read about something in previously published reports
    - ◊ It reminds you of a theory or a concept.
- You can use preconceived theories or concepts.
- You can be more open.
- You can aim for descriptions of things that are superficial.
- You can aim for a conceptualisation of underlying patterns.
- It is your study and your choice of methodology.
- You are the interpreter and these phenomena are highlighted because you consider them important.
- Just make sure that you tell your reader about your methodology and the choice you make; do that under the heading method.
- Be unbiased, stay close to the data, i.e. the transcripts, and do not hesitate to code plenty of phenomena.
- You can have over a hundred codes.

Step 3: Decide which codes are the most important

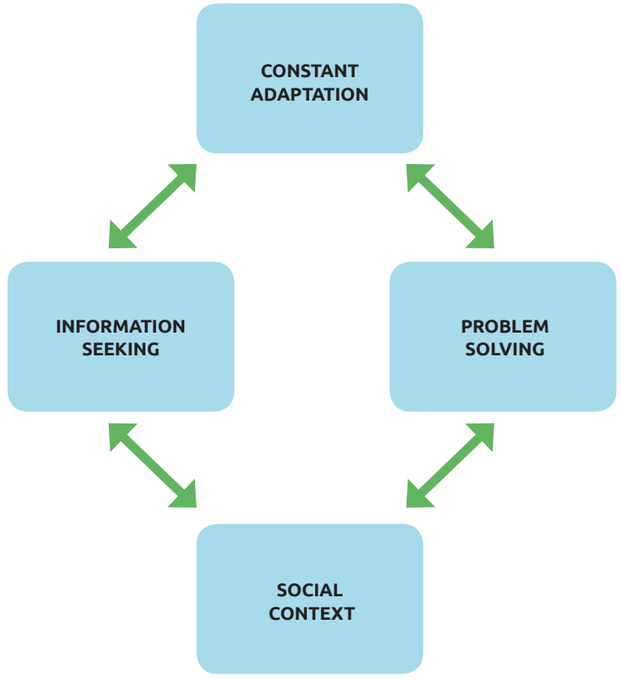
- Create categories by bringing several codes together.
- Go through all the codes created in the previous steps.
- You can create new codes by combining two or more codes. You don't have to use all the codes that you created in the previous steps.
- In fact, many of these codes can now be dropped.
- Keep the codes that you think are important and group them together in the way that you want.
- Create themes.
- Be unbiased, and open-minded
- Conceptualise your data.

Step 4: Label categories and decide which are the most relevant and how they are connected to each other

- Label the categories.
- Describe the connection between them.
- The categories and the connections are the main results of your study. It is new knowledge about the world from the perspective of the participants in your study.

Step 5: Some options

- Decide if there is a hierarchy among the categories.
- Decide if one category is more important than the other.
- Draw a figure to summarise your results.



Step 6: Writing up your results

- Under the heading results, describe the categories and how they are connected. Use the natural voice and do not interpret your results.
- Under the heading discussion, write out your interpretation and discuss your results. Interpret the results in the light of for example:
    - ◊ Results from similar previous studies published in relevant journals
    - ◊ Theories and concepts from your field
    - ◊ Other relevant aspects.

Excerpts from Kent (2001).

ANNEXE 3.4: SAMPLE QUALITATIVE ANALYSIS OF INTERVIEW TRANSCRIPTS (DATA)

Mr. Amaa is an English tutor at a college of education in Ghana. He has taught a course, FDC111, for two semesters and has observed that the students' pronunciation of some English words is different from that of the standard one. He has decided to conduct an action research to find out why this is so and if it is possible to correct the pronunciation errors. In doing so, he had a preconceived idea that 'in learning a second language (L2), the learner's L1 phonology influences that of his L2'. He therefore used the elicitation paragraph below to elicit data from some participants, which he transcribed:

Original Elicitation Paragraph

Please call Sheila. Ask her to bring these things with her from the store: six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for her brother Bob. We also need a small plastic snake and a big toy frog for the kids. She can scoop these things into three red bags, and we will go meet her Wednesday at the train station.

Coding the transcribed DATA
Participant 'A'

Pelease call Seila. Aks her to beringdesetings wif her from the setore: sissepoons of fressenow peas, fifetick slabs of bulue cheese, an may be a senack for her boroder Bob. We alisoneet a semalpelasticsenakeanabik toy frok for the kits. See can sicoopdesetings into tiree ret baks. an we willi go meet her Wenesday at the trainisitasin.

Participant 'B'

PleaseconSeila. Aks her to biringdesetingswit her from the sitore: sissipoons of fressinow peas, fifeticksilabs of bulue cheese, an may be a sinack for her bereder Bob. We alisoneet a simallpilasiticsinakean a bik toy forok for the kiks. see can sucoop dese tings into firee red baks, an we willi go meet her Wenesday at the trainistasing.

Themes	'P' A	'p' B	Description of theme
Consonant cluster	14	15	Inability to produce double consonant without splitting it with a vowel
Plosive sound in word terminal	7	7	Dropping plosive at the end of a word or replacing it with the voiceless consonant
The SH (ʃ) sound	4	4	Replacing the 'TH' sound with the 'S' sound
The TH (θ/ð) sound	8	8	Replacing the 'TH' sound with 'T', 'D', or 'F' sound

Excerpts from Abdul-Moomin (2010)

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UNIT 4: USING ACTION RESEARCH TO IMPROVE PRACTICE

Learning Outcomes
By the end of this unit tutors would be able to:
1. Use analysis to begin to identify patterns in their data.
2. Interpret implications of tutors' data analysed for (a) trainee teachers' learning and (b) tutors' classroom practice.
3. Identify the sources tutors would use to collect further data which they would need to support teacher trainees in conducting action research.

Revision Activity: Reflection from Unit 3 (10 minutes)

Individually, answer the following questions in your notebooks:
- What principles did you use in analysing the data collected in Unit 3?
- In conducting action research, what are the challenges with qualitative data analysis?

INTRODUCTION

Every time a teacher changes a lesson plan or tries a new approach with his/her students, he/she is engaged in trying to figure out what works well. Even though the teacher may not acknowledge it as formal research, he/she is still investigating, implementing, reflecting, and refining his/her approach. This leads to improvement in the teacher's practice (Sagor, 2005).

Activity 1: Identifying Patterns in Data (35 minutes)

In groups of four to six, answer the following questions:

- What are your observations about the tutors' L1 and L2 analysis in Annexe 3.4 and what conclusions can you draw from this?
- What are the implications of your findings for language teaching?
- What measures could be taken to address the language issues raised in the analysis?

Write your answers on flip charts for whole class discussions.

Activity 2: Sources of Data Collection (35 minutes)

- Pick a piece of paper from the box provided by the PDC.
- In your groups, discuss how the source of collecting data you picked would help you decide appropriate interventions for the problem you worked on in the coding exercise in Unit 3 using Figures 4.1 and 4.2.
- Write your responses on flip charts for whole class discussions.

REFLECTION (10 MINUTES)

Read Annexes 4.1 on the Anecdotal Records and Observations for Child #1 and Child #2.

a. Identify some patterns observed.
b. Identify the interventions that were suggested to be used to solve the problems identified.
c. Suggest other appropriate interventions you would use to solve the problems observed.

INTER-UNIT ACTIVITY

For the next PDS, read Unit 5.
Which modes of assessment do you use as a tutor to take care of assessment *for* learning, *of* learning and as learning in the current Diploma in Basic Education programme?

MATERIALS FOR UNIT 5:

- Current course outlines
- Some of your assessment questions.

UNIT 4 - ANNEXES

ANNEXE 4.1: SOURCES OF INQUIRY

a) Concept Map

The concept map begins with an idea or concept, then breaks out into different branches. These branches show how the main idea can be broken into other specific topics. "A concept map is a schematic device for representing a set of concept meanings embedded in a framework of propositions" (Novak, 1984, p. 15). Concept maps are created with the broader, more inclusive concepts at the top of the hierarchy, connecting through linking words with other concepts that can be subsumed. Concept maps are an important strategy in qualitative enquiry because they help the researcher to focus on meaning. The maps allow the researcher to see participants' meaning as well as the connections that participants discuss across concepts or bodies of knowledge. The example below shows the concept map of fraction.

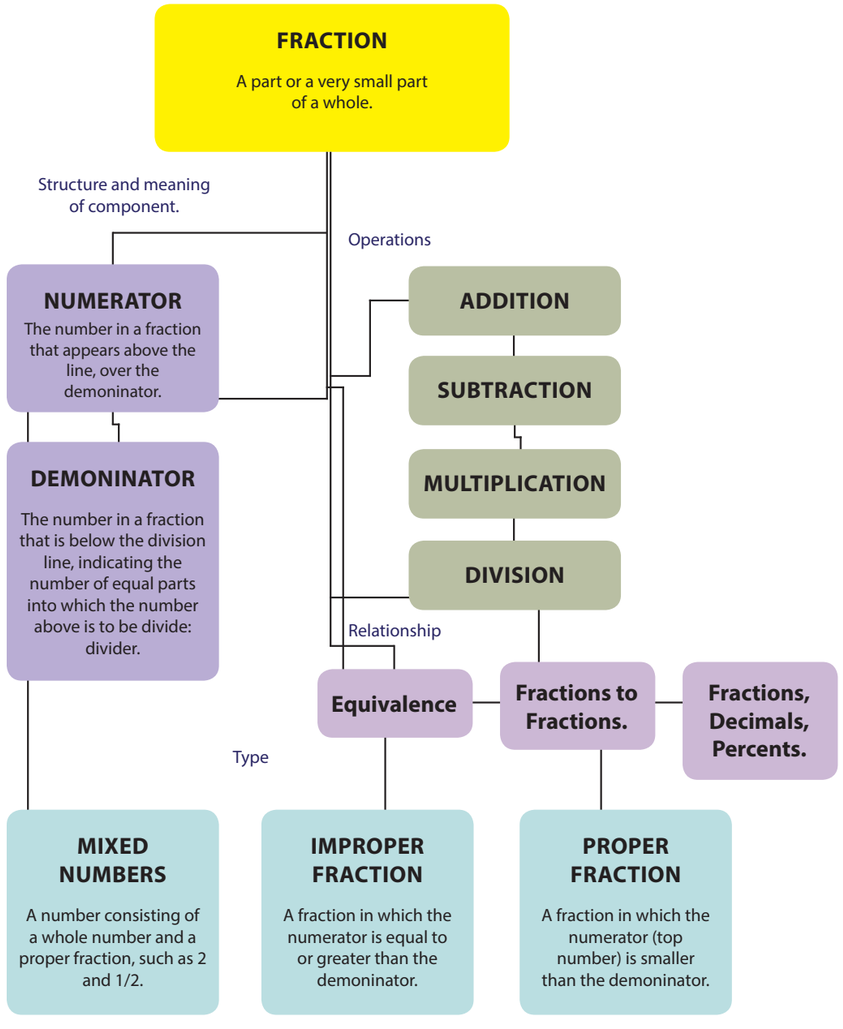

Figure 4.1: Toncheff (2011). Concept map for numeracy. An Example.

Name: _____ **Date:** _____ **Class Period:** _____

VOCABULARY CLUSTER MAP 1

Direction: Place the required information in the area as indicated.

Word 1:	**Definition:**	**Synonyms:**
Part of speech:		**Antonyms:**
Use in a sentence of your own:		
Word 2:	**Definition:**	**Synonyms::**
Part of speech:		**Antonyms:**
Use in a sentence of your own:		
Word 3:	**Definition:**	**Synonyms:**
Part of speech:		**Antonyms:**
Use in a sentence of your own:		
Word 4:	**Definition:**	**Synonyms:**
Part of speech:		**Antonyms:**
Use in a sentence of your own:		

Figure 4.2: Manis (2012). Concept map for literacy: An example.

b) Anecdotal Records

An anecdotal record is an observational method used frequently in classroom or learning settings in which the observer summarises a single developmental incident after the event has occurred. Such records are intended to be brief, factual accountings.

Anecdotal records are written in journalistic form. They identify the who, what, where, when and how of a particular incident, focusing on the subject's specific conduct in the situation. In early childhood education, teachers use anecdotal records in common practice for assessment of skill development in young children. The recorded observations are intended to identify the child's current skill level, interests and skills to develop next.

Anecdotal Records and Observations

Activity Observed	Child #1	Child #2
Observation #1 Activity: Writer's Workshop Time observed: 5 minutes	• Drops pencil and book on floor • Looks at child sitting next to him • Looks at his neighbour's paper • Shakes pencil • Turns pencil around in hand	• Writes constantly through the writing time • Twirls pencil in fingers • Stares at overhead for 20 seconds • Closes writing journal before end of lesson
Observation #2 Activity: Writer's Workshop Time observed: 5 minutes	• Sticks pencil through notebook rings • Closes writing journal during lesson • Slouches in seat • Places head on desk	• Stares at teacher as she gives directions • Places head on desk • Sits up straight in her chair • Turns bookmark around in her hands

Implications for Child #1:

From these observations, one may conclude that this student has trouble focusing his attention, or staying on task. He often is observed manipulating his pencil or notebook. He also left his seat twice in a five-minute period. Because this student needs to be manipulating or using his hands, I would allow this student to perform more hands-on activities, rather than have him complete deskwork. Since he feels a need to be up and around, I would also allow this student to take his work with him to a place of his choice in the room, and let him stand up or move around while he works without disturbing other students.

Implications for Child #2:

This child appears to be able to focus her attention on a task for only a few minutes, before she starts to manipulate her pencil, notebook, or anything on her desk. The child wrote intently for about three minutes before she began to manipulate her pencil in her hands. I would have this child work on various tasks, but for a short amount of time each. From observing her, I find that she can consistently work on one project for only a few minutes. Therefore, I might place a timer on her desk, and ask that she write for four minutes straight, and then she can go onto the next activity for a set number of minutes. Gradually, I would increase the amount of time she needs to spend on each activity. With this instructional implication, the child would not become bored or disinterested in a task; rather, her interest would be piqued with a new activity every few minutes (Ima, 2015).

c) Time-Sampled Observations

A time sampling observation is a data collection method that records the number of times a specific behaviour was noticed within a set period of time.

Time sampling is used to gain a clear understanding of typical behaviour. Depending upon the purpose of the study, the researcher monitors the behaviour of an individual or a group. Within a predetermined interval, the researcher records the number of times a behaviour is observed. To be certain that the information collected is an accurate representation, data is collected over many intervals. In Momentary Time Sampling, time is broken into intervals, such as one-minute intervals for 50 minutes, and data is taken at the end of each interval. Data is recorded as percentage of intervals in which the behaviour is occurring. It is assumed that the behaviour occurred for the entire interval. For example, a teacher can measure an on-task behaviour for a student by setting a phone to buzz every two minutes. When the phone buzzes, the teacher will record whether the student is on-task or not. The teacher then assumes the behaviour occurred throughout the interval when calculating the student's time on-task (Gast, Ledford & Ebrary, 2014).

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UNIT 5: REDESIGNING COURSE OUTLINES AS PART OF ACTION RESEARCH

Learning Outcomes
By the end of this unit tutors would be able to:

- Explain the need to review their course outlines in the process of conducting action research.
- Identify ways in which they can review their course outlines in the process of conducting action research (taking into consideration gender and inclusivity issues).
- Discuss ways of strengthening trainee teachers' learning using results from action research.
- Explain how **assessment as, for and of learning** can be used in action research.

Revision Activity (10 minutes)

In pairs, discuss the question below and share your findings with the whole group.
Which methods of assessment do you use as a tutor to take care of:

- assessment **as** learning;
- assessment **for** learning; and
- assessment **of** learning in the current Diploma in Basic Education programme?

INTRODUCTION

All course outlines should be reviewed on a regular basis to meet the changing needs of learners. Tutors should review their course outlines in line with the National Teachers' Standards (NTS), National Teacher Education Curriculum Framework (NTECF) and students' feedback. Finally, there is a need to explain how assessment as, for and of learning can be used in action research. The evidence / data collected through assessment and other means can then be used to look at how you strengthen your course to meet learner needs.

Activity 1: Reviewing Existing Course Outlines (25 minutes)

There are various reasons for reviewing or amending existing course outlines.

1. On what basis can a course outline be reviewed? Refer to Annexes 5.1 and 5.2.
2. What are some of the inclusivity issues to consider when reviewing a course outline?

Activity 2: Key Concepts and Expectations in Reviewing Course Outlines (25 minutes)

Discuss the key concepts and expectations (as found in the curriculum framework) in reviewing course outlines.

For this activity, use the pyramid method as follows:
- Make notes individually.
- Work in pairs and share their list of ideas.
- Work in fours and share their ideas and add to the list.
- Present to the whole group.

Refer to Annexes 6.2 and 5.3

Activity 3: Reviewing Existing Course Outlines to Support Trainee Teachers' Learning

In your departmental groups:
- Suggest ways of reviewing your course outline(s) to support trainee teachers' learning.
- Be prepared to report to the whole class for discussion.

REFLECTION (10 MINUTES)

Reflect on the key issues in the unit by answering the following questions:
- Have you achieved the learning outcomes for Unit 5?
- How do you know?
- What can you do now to deepen your knowledge and skills in reviewing your subject curriculum to further support your trainee teachers' learning?
- What are some of the issues to consider when reviewing your subject curriculum to ensure equity and inclusivity?

INTER-UNIT ACTIVITY

You are requested to read Unit 6 and answer the following question in preparation for Unit 6:
- What key concepts and expectations would you consider in reviewing course outlines to support and strengthen progress in trainees' learning?

MATERIALS FOR UNIT 6:

- Course outline for each subject / learning area.
- A copy of a trainee teacher's action research project you are currently assessing.

UNIT 5 - ANNEXES

ANNEXE 5.1: AIMS AND GUIDING PRINCIPLES FOR CURRICULUM WRITING

Everything written must be:

- Justified in terms of how it supports the trainee in becoming the best possible teacher
  - ◊ Effective, engaging, inspirational teachers who are fully prepared to teach the basic school curriculum and able to support the learning and progress of all pupils
- Achievable, do-able for a trainee at the stage of training entry level, beginning, developing, embedding, scaffolding, supporting and challenging learning for groups of trainees and individuals in the time available
- Coherent across the programme in terms of the depth and breadth of knowledge
- Aligned to the National Teacher Education and Curriculum Framework (NTECF), to achieving the National Teaching Standards, to teaching the Basic School Curriculum
- Inclusive of appropriate teaching, assessment and evaluation strategies to the subject or content matter or topics to be taught to trainees and pupils
- Considered in terms of:
  - ◊ Available teaching and learning resources, materials – identify as you write
  - ◊ Continuous professional development (CPD) for mentors, tutors – identify as you write
  - ◊ Equity and inclusivity, cross-cutting issues (CCI) – identify as you write
  - ◊ Whether it is essential for trainees? Is it desirable?
  - ◊ How it will build capacity to improve the quality of training
  - ◊ Whether it will require the trainee to address community, context or cultural issues
  - ◊ Principles and practice of high quality professional values and individual behaviour (identify these).

(Excerpts from NTECF)

ANNEXE 5.2: ADDITIONAL INFORMATION ON THINGS TO CONSIDER WHEN REDESIGNING COURSE OUTLINES:

1. Who are the trainee teachers offering the course to be redesigned, i.e. what is their level?
2. Which aspects of the course do I need to change?
3. Why do you think there is the need to redesign the course outline? Provide at least three reasons.
4. (a) What knowledge do you want your learners to acquire?
   (b) How beneficial will this knowledge be to them and their learners?
5. (a) What skills do you want them to gain?
   (b) What benefits will they and their learners gain from this?
6. How will you disseminate the knowledge and skills you want the trainees to gain?
7. How will the trainee teachers' performance be measured?
8. How will the trainee teachers' performance be enhanced?

ANNEXE 5.3: SOME CONCEPTS AND EXPECTATIONS

Pillar 3: Pedagogic knowledge (PK)

Knowledge of instructional and assessment strategies is key to supporting the learning and progress of all pupils

Introduction

Pedagogic knowledge refers to the specialised cognitive knowledge of teachers for creating effective teaching and learning environments for all learners (Guerriero, 2017). It is therefore composed of general pedagogical knowledge and pedagogical content knowledge. Pedagogy is described as the instructional techniques and strategies which enable learning to take place. It refers to the interactive process between teacher and learner, and it is also applied to include the provision of some aspects of the learning environment (Siraj-Blatchford et al., 2002:10). The term pedagogic knowledge is used throughout the Framework as one of the pillars of knowledge. Pedagogic knowledge includes all the required cognitive / pedagogical knowledge for creating effective teaching and learning environments. It is therefore composed of general pedagogical knowledge and pedagogical content knowledge.

Pedagogical knowledge encompasses the broad principles and strategies of classroom management and organisations that go beyond subject matter. Its purpose is to enable trainee teachers to understand school subjects through linkages among leaners, context, subject discipline and pedagogical approach. It draws together teachers' knowledge of the theories of learning and general principles of instruction, their understanding of the various philosophies of education and how they can support effective teaching, general knowledge about learners, and knowledge of the principles and techniques of classroom management (Grossman and Richert, 1988). Teachers therefore need to draw on a range of knowledge and weave it into coherent understanding and skills in order to become competent and to connect content, and teaching and assessment in the classroom. Pedagogical knowledge does not only depend on the subject matter discipline and methodology used but must take into account the learner and their background and context.

Pedagogic knowledge is most closely aligned to the professional practice domain of the National Teachers' Standards. However, it also reflects how the three domains and aspects of the National Teachers' Standards intersect bringing together what teachers should value, know and be able to do, so there is an overlap to Professional Knowledge and also Professional Values (see pages 17 and 18 of National Teachers' Standards). Cross-cutting issues are introduced through pedagogic knowledge.

In brief, this pillar addresses:

- instructional strategies
- introduction to cross-cutting issues: inclusivity, professional values, etc.
- assessment to support differentiation and learning, core skills
- barriers to learning
- effective mechanisms for planning
- behaviour management strategies
- preparation for supported teaching in school
- implications of learner backgrounds
- contemporary studies.

General pedagogical knowledge

Rationale

General Pedagogical Knowledge refers to the principles and strategies of classroom management and organisation, teaching methods, assessment, learning processes and learner characteristics that are cross-curricular. The rationale for pedagogical study is to help trainees understand how to teach and assess the subjects that schools offer and their pedagogical approaches in the context of the school and the learner. Pedagogical study makes teachers see the linkages among learner, context, subject discipline and the pedagogical approach. Courses in General Pedagogical Knowledge (PK) are focused on the learner and his/her context. Teachers' PK is the 'how' of teaching and it includes knowledge of different theories about learning, learning styles, learners' context, planning and management, and evaluation. General Pedagogical Knowledge is acquired through education coursework and developed and embedded through supported teaching in school (personal experiences). The links between subject and curriculum knowledge and pedagogical knowledge need to be made explicit to trainees.

Curricular provision

Theoretical Aspects

Courses in pedagogy: these include knowledge as construction through experiences; nature of disciplines; critical understanding of school curriculum, and pedagogy as the integration of knowledge about the learner, the discipline and the context. This would include separate but interrelated courses on knowledge of classroom management; knowledge of learning processes; knowledge of teaching methods; knowledge of classroom assessment; structure; adaptivity; knowledge of individual student characteristics and behaviour management. A pedagogy course should include the following: i) skills in, and knowledge of, class management and ii) skills in, and knowledge of, managing students' learning. The issues of trainee teachers' engagement with learners' assessment needs to be integrated with courses in pedagogical studies. It should include a rigorous critical reading of perspectives that regard learner assessment. The training should broaden the scope of assessment beyond achievement testing to cover a child's overall development, action research and reflective practice strategies for supported teaching in school.

Practical Aspects

Practical courses should be designed on:

- themes of classroom management;
- teaching/learning materials development and;
- supported Teaching in Schools.

Trainee teachers learn to integrate ideas, experiences and professional skills through hands-on experience of developing curriculum and learning materials, designing appropriate activities for children of different age groups and formulating questions to facilitate learning. Also, trainee teachers need to learn to prompt pupils to ask questions and to learn to collate these to further the processes of learning. For instance, in a language pedagogy course, trainee teachers would need to:

- engage with projects involving listening to and developing children's reading;
- observe and analyse reading difficulties;
- observe and identify mismatches between school language and home language;
- analyse textbooks and other materials used in different subjects in terms of presentation, style and language used.

Practical activities should include:

- hands-on learning;
- planning lessons to accommodate learners' interests and adopting creative ways for teaching the basic school curriculum, drawing upon low- or no-cost teaching and learning resources;
- collection and presentation of specimens of natural resources and indigenous knowledge available in the area using reports, journals, magazines, newspapers, documents, atlas, map drawing and reading in the classroom.

After this exercise, student teachers can be engaged in other activities such as:

- reflective discussion;
- learning how-to-do observations, recording and analysing them.

Supported teaching is one of the ways to ensure that trainee teachers will have the opportunity to be engaged in school contexts to interact with learners This will create the opportunity for trainees to learn how to design projects that are level specific.

Pedagogical content knowledge

Rationale

The study of subject specific pedagogy, also referred to as Pedagogical Content Knowledge, is included in subject and curriculum knowledge. It will equip trainee teachers to understand school subjects and the pedagogical approaches in the context of the school and the learner. It will help the teacher to establish the links between, and among, learner, context, subject discipline and the pedagogical approach. Teachers' Pedagogical Content Knowledge (PCK) is a key concept in teaching. PCK is the type of knowledge that is unique to teachers and relates to the manner in which teachers relate what they know about teaching (general pedagogical knowledge) to what they know about what they teach (subject matter knowledge). It refers to teachers' knowledge about how to combine pedagogy and content effectively. Teachers' knowledge about the pedagogy of subjects, such as language, sciences, mathematics and social studies, equips them with the skills needed to manage the teaching and learning process in such a manner that they will be able to draw upon epistemological insights while teaching any of the key disciplines.

PCK is a form of practical knowledge that entails, among other things (a) knowledge of how to structure and represent academic content for direct teaching to students; (b) knowledge of the common conceptions, misconceptions, and difficulties that students encounter when learning particular content; and (c) knowledge of the specific teaching strategies that can be used to address students' learning needs, in particular in classroom circumstances.

The transformation of subject matter for teaching occurs as the teacher critically reflects on and interprets the subject matter; finds multiple ways to represent the information as analogies, metaphors, examples, problems, demonstrations, and classroom activities; adapts the material to students' abilities, gender, prior knowledge, and preconceptions (those pre-instructional informal, or non-traditional ideas students bring to the learning setting); and finally tailors the material to those specific students to whom the information will be taught.

In addition to PCK, technology in pedagogy is important. Technological Pedagogical Content Knowledge (TPCK also called TPACK) entails the existence, components and capabilities of various technologies that can be and are used in the teaching and learning process. Trainee teachers need to integrate technology into their teaching. This knowledge will build trainee teachers' capacity about how teaching and learning might change depending on the type of technology they employ. Teachers' TPCK will help them understand the range of tools that exist for doing specific tasks during the teaching / learning process; choose tools based on their fitness; find strategies for using the tools; discover knowledge about pedagogical strategies and the ability to apply the strategies for the use of information technologies.

Curricular provision

Theoretical Aspects

Courses in Pedagogy, Content and Technology: knowledge as construction through experiences, nature of disciplines, critical understanding of school curriculum; and pedagogy as the integration of knowledge about the learner, the discipline and the context. This would include building trainee teachers' capacity in PCK and TPCK/TPACK in the different subject areas such as literacy, mathematics, and integrated science and citizenship education / social studies at early grade, upper primary, and junior high school / senior high school levels of education. In particular, trainee teachers' TPCK requires an understanding of the representation of concepts using technologies and of pedagogical techniques that use technologies in constructive ways to teach content. Subject specialist trainee teachers will need to engage with deeper epistemological questions of the disciplines they specialise in. Specific tasks related to how learners engage with school subject-content misconceptions need to be addressed through a rigorous study of disciplinary knowledge, besides a specific focus on content area literacy and tasks of writing observations and analysis for enhancing conceptual understanding. Pedagogy courses will need to be designed to address specific levels of education – early grade (KG to P3), upper primary and secondary.

Practical Aspects

Practical aspects of the PCK should be designed in a manner to facilitate the transfer of knowledge from pedagogical knowledge into specific subjects. Also, practical aspects should include the best ways to use technology to teach with the understanding of technological pedagogical content knowledge as well as technological material development / usage in teaching content. Practical activities could be based on the integration of technological content knowledge, general pedagogical knowledge and pedagogical content knowledge in the classroom. These could be followed by reflective discussion, learning how to make observations, and by recording and analysing them. Such an approach would help forge links between the learner and his/her context, disciplinary content and the technological pedagogical content knowledge used. A key component of this entails trainees observing their tutors teach specific subjects in the placement schools, engaging in hands-on learning activities or watching video clips to appreciate how the theory can be applied in practice (MoE, n.d.).

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UNIT 6: DEVELOPING COURSE OUTLINES BASED ON ACTION RESEARCH

Learning Outcomes
By the end of this unit tutors would be able to:

- Discuss how to use action research intervention to support trainees' learning.
- Use competencies developed from action research to prepare course outlines for the new curriculum when it is ready.
- Suggest key insights from action research relating to trainees' learning needs and how the new curriculum would address them.

Revision Activity (5 minutes)

Use brainstorming to answer the question below:
What key concepts and expectations would you consider in reviewing course outlines to support progress in trainees' learning?

INTRODUCTION

This Unit will allow you to apply the principles and practices of action research to support trainee teachers' learning. It will consolidate your knowledge and skills in using action research. It is expected that action research would be carried out simultaneously with the teaching practice to enable trainee teachers to acquire the research skills to improve their practice.

Activity 1: Using Action Research to Address Learning Needs (30 minutes)

Read the case study below and complete the activity.

Case Study

Miss Obaa Ahoofe is a newly-hired tutor of a college. She has been assigned the responsibility to teach English. After her initial assessments, she realised that about 80% of the students had problems in the use of punctuation marks in their essay and grammar exercises. The class comprises 20 female and 30 male trainees.

In your groups, carry out the activity below:
Use the template in Annexe 6.1 as a guide to prepare an outline to support Miss Ahoofe in designing a classroom action research, which would address these learning needs of her trainees.

Activity 2: Using Action Research to develop course outlines based on the curriculum. (30 minutes)

In your groups, carry out the activity below:

- In your subject groups, describe how you would use learning needs of trainee teachers identified earlier to develop a course outline consistent with the curriculum framework.
- Use Table 6.1 to write down the details of your reviewed course outline.
- Share your developed course outline on a flip chart with the whole class.

Table 6.1: Course Outline Based on the Curriculum

Name of Subject/Learning Area:		Semester:		Year/Level:
What new key contents and concepts were reviewed?	**What Initial Teacher Education (ITE) pedagogy would be required to teach?**	**Assessment of trainees (how would you assess trainees?)**	**What CPD skills would be required for teaching the revised content?**	**Indicate possible cross-cutting issues which need to be strengthened.**

Activity 3: Key Insights Action Research Raises in Line with the New Curriculum (20 minutes).

In your groups, use Table 6.2 to address the following:

i) Suggest examples of common themes / ideas for pedagogic knowledge and subject and curriculum knowledge components. Refer to Annexe 6.2.
ii) Complete the table and use it to answer Question iii.
iii) How would the new curriculum address these suggested themes in trainee teachers' teaching and learning?

Table 6.2: Components of the NTECF and Some Common Themes

Pillar / Component	Sub-component	Examples of Common Themes
Literacy Studies	Early Grade Literacy	• Phonemic Awareness • Phonics • Fluency
Pedagogic Knowledge	Instructional Strategies	
Subject and Curriculum Knowledge	Subject Knowledge for Teaching Content	

REFLECTION (5 MINUTES)

- Did you achieve the learning outcomes of Unit 6?

Reflective question for your personal reflection: implications for practice.

- How can you strengthen current trainee teachers' learning needs through action research?

INTER-UNIT ACTIVITY

How can action research findings be disseminated?

MATERIALS FOR UNIT 7:

- One-page proposal / abstract written by tutors in their subject areas.

UNIT 6 - ANNEXES

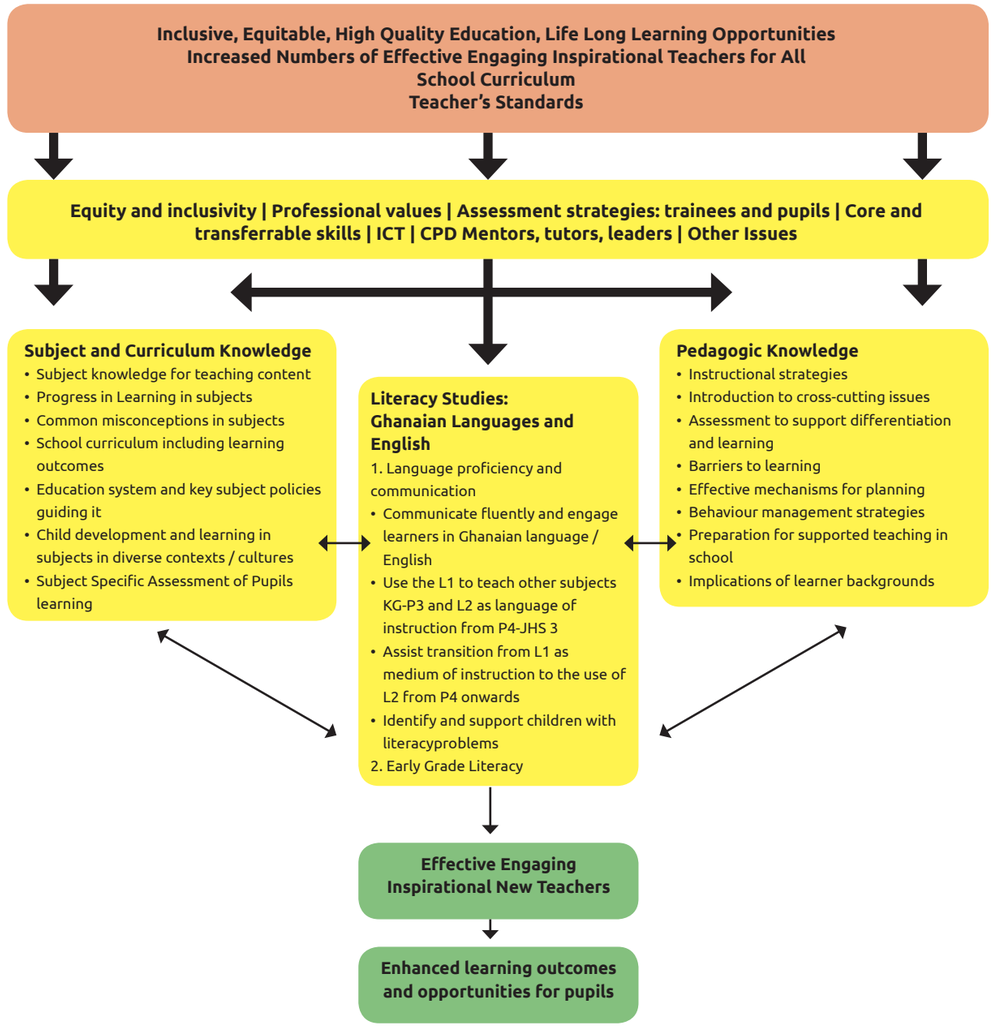
ANNEXE 6.1: SUGGESTED OUTLINE FOR RECOMMENDATION ON CASE STUDY

Note: You may use this template to make recommendations to guide the English tutor on her action research.

	Suggested Outline	Details of Outline	Recommendations
1	Background to Study	What is your perceived problem?	For example: Identify and write down your perceived problem in the teaching of English with your trainees. Conduct self-reflection on your teaching first and then reflect together with your trainees to find out the real learning needs.
		How do you conduct your diagnosis (Evidence and Causes)?	
		Statement of Problem: Purpose Objectives Research Question Significance / importance	
2	Literature Review	Relevant and related literature (using note card to collect ideas from various sources)	
3	Methodology	Design the type of research	
		Setting: Population Sampling technique / ethical issues to consider	
4	Intervention	Major and smaller steps to be used	
		State how the intervention will be implemented	
		State problems likely to be encountered.	
5	Data Collection	What instrument to be used?	
		Types of data to be collected	
6	Data Analysis	How will data be presented? How will data be analysed? How will data be interpreted?	
7	Conclusions and Recommendations	State significance of findings State your self-reflection (including your next steps for your research)	

Source: Adopted from Kankam, G and Weiler, J (2010): A Guide to Action Research for Colleges of Education and Universities. Readwide Publishers: Accra.

ANNEXE 6.2: NATIONAL TEACHER EDUCATION CURRICULUM FRAMEWORK (NTECF)



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UNIT 7: WRITING FOR PUBLICATION: AUDIENCE, STYLE AND PURPOSE

Learning Outcomes
By the end of this unit tutors would be able to:
- Discuss the need for publication.
- Describe the essential elements of articles for publication.
- Identify what support would be needed to enable them to write for publication.

Revision Activity (5 minutes)

Answer the question:
How can action research findings be disseminated?
Read the introduction and the learning outcomes.

INTRODUCTION

It is essential for tutors to appreciate their roles and responsibilities as researchers and tutors of research. The scope of research goes beyond writing and using research results to address learning needs and includes disseminating findings through publishing. The transition of Colleges of Education into tertiary status requires tutors to publish articles.
In this unit, we will be looking at how to document issues from reflections and engage in action research for publication.

Activity 1: Need for Sharing Research through Publication (15 minutes)

Using "find someone who ..."

- Walk around and find a colleague to tell you reason(s) why tutors in the Colleges of Education need to publish.
- Be prepared to read out a reason to the whole class for discussion.
- Refer tutors to Annexes 7.1a and 7.1b to find out other reasons for publication.

Activity 2: Writing Process (20 minutes)

In your subject groups, study the five-step writing process in Annexes 7.2 and 7.3

- Discuss your findings with a partner within your group with focus on steps you find challenging.
- Share your experience with the steps, if any, with other members of the group.

Activity 3: Essential Elements of Articles for Publication (35 minutes)

In your groups:

- Study the sample journal (Annexe 7.5) and write the essential elements of the published articles in your PDS journals.
- Write the elements of a journal on a flip chart.
- Compare the essential elements in your PDS journals with elements captured on the flip chart. Refer to Annexe 7.4.
- Exchange your one-page abstract / proposal.
- Use the elements on the flip chart to review the abstract / proposal of a colleague.

Activity 4: Support Needed to Write for Publication (10 minutes)

In groups, discuss the support that you will need to enable you to write for publication.

- Write your responses on a flip chart for reporting.
- Display your work for a gallery walk.

REFLECTION (5 MINUTES)

- What are the implications of publication for your classroom work?
- What do you need to work on to improve your writing for publication?

INTER-UNIT ACTIVITY

Read Unit 8 to make sure you are adequately prepared for fruitful discussion.

MATERIALS FOR UNIT 8:

Remember to bring this handbook

UNIT 7 - ANNEXES

ANNEXE 7.1A: HARMONISED CONDITIONS OF SERVICE FOR JUNIOR STAFF AND SENIOR STAFF B OF COLLEGES OF EDUCATION, ARTICLES 5.9, 5.10 AND 5.11

5.9: Promotion to the grade of senior tutor shall be considered on the bases of good performance in the following:

- Scholarship
- Research contribution to knowledge
- Teaching
- Academic leadership
- Inventiveness
- Extension work / service
- Creative and artistic production / works.

5.10: Application for promotion based solely on teaching and extension work /service, or other contributions that do not normally result in publications, shall not be considered during the first six (6) year contract period.

5.11: Promotion to the grade of Principal Tutor shall be on the basis of clause 5.6 above as well as outstanding scholarship in the candidate's field of teaching and research and contribution to the intellectual life of the College or the country.

ANNEXE 7.1B: SOME BENEFITS OF PUBLISHING TO PROGRAMMES OF TEACHER EDUCATION

- The content of some programmes may be informed by research-based knowledge and scholarship, emanating from a range of academic disciplines and epistemological traditions.
- Research can be used to inform the design and structure of teacher education programmes.
- Teachers and teacher educators can be equipped to engage with, and be discerning consumers of, research.
- Teachers and teacher educators may be equipped to conduct their own research, individually and collectively, to investigate the impact of particular interventions or to explore the positive and negative effects of educational practice.
- Publishing gives a more assured and accepted scholarly work.
- By publishing, one's contribution to knowledge is shared with a wider range of knowledge users.
- Evidence of work done on resolving learning problems and general educational needs is documented and not easily lost.
- There is financial reward that emanates from the publication and sale of documented research work.

(BERA, 2014)

ANNEXE 7.2: THE FIVE-STEP WRITING PROCESS

LifeRich Publishing presents a five-step writing process from brainstorming to publishing as discussed below.

Prewriting

It is necessary to do a draft of your ideas and activities conducted. Prewriting considers all that you do or need to do before the draft. This includes:

Finding Your Ideas: Everyday interactions within the school community and specifically with a learner generates ideas that can inspire the individual into probing further into an issue of interest.
Build On Your Ideas: It is necessary to add flesh to the ideas by writing every idea that comes into your head. The researcher brainstorms on and edits what has been drafted.
Plan and Structure: This is the time to sort through your ideas and choose the ones you will use to form your story.

Writing

Start writing even though the process might not be smooth from the beginning. You might encounter various errors in your draft and blockades as you try to move forward. The various challenges must not deter you from continuing to write. Think of this stage as a free writing exercise, just with more direction. Do not break the writing but make it a regular part of your day.

Revision

LifeRich states that many writers adopt the A.R.R.R. approach: in revising, you need to Add, Rearrange, Remove and Replace.

Add: It is necessary to consider the adequacy of words written. Your write-up must carry all the information your readers need to read in order to understand what message you want to carry. Add to your work where your work is inadequate.

Rearrange: Check to be sure your work is sequenced in a way which flows. Change the order of events to occur in their rightful place.

Remove: Do away with elements or portions which deviate from the story line and those you may deem not to fit, although they may not actually deviate.

Replace: After you have added and removed, check if it will be prudent to revise your work by rewriting certain portions. You might do this by giving further clarification of events, harmonising your ideas to avoid contradictions, and by enlisting support from peers and more experienced writers.

Editing

It is the author's responsibility to make sure a manuscript is rich in content and in context. It is important to check for mistakes and avoid them. Be mindful of your grammar, clarity of ideas, spelling and punctuation. Let peers and experienced writers edit your work.

Publishing

Once your manuscript is completed, look for publishing bodies to enable you to carry your work into the public domain. Do not let your work remain on your table or shelf. There are journals available which contain good articles. You could also publish your work as a book. Market your work as far as possible.

(Excerpts from Kimmel, 2012)

ANNEXE 7.3: SOME ESSENTIAL INGREDIENTS

- Problem / topic must appeal to the senses
- Think of your audience
- Use proper English throughout the entire manuscript. It is the author's responsibility to make sure a paper is in the best form possible
- Consider the ethics of research and publication
- Consider peer reviewers as essential
- Practise revision and expansion of the write-up.
- Realise that you don't have to make every suggested change
- Get emotional support.

Excerpts from Kendal-Tacket, 2017.

ANNEXE 7.4: ESSENTIAL ELEMENTS OF PAPER FOR PUBLICATION

Presented on Flip Chart

- Title Page
- Abstract
- Introduction
- Methods
- Results
- Discussion
- Conclusions
- Acknowledgements
- References
- Table Captions
- Figures and Figure Captions
- Authorship and Originality

ANNEXE 7.5: PUBLISHED ARTICLE (REPRODUCED FROM SCHMIDT)

Classroom Action Research: A Case Study Assessing Students' Perceptions and Learning Outcomes of Classroom Teaching Versus On-line Teaching

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Action research has grown in popularity throughout the past two decades (Harkavy, Puckett, & Romer, 2000; Fleming, 2000). It is becoming a more accepted tool for teachers to assess their own teaching strategies and reflect upon their effectiveness. McNiff (1999) defined action research as the name given to an increasingly popular movement in educational research that encourages teachers to be reflective of their own practices in order to enhance the quality of education for themselves and their students. McNiff continued that action research is a form of self-reflective inquiry that can be used in school-based curriculum development, professional development, and school-improvement schemes. Schmuck (1997) extended on teacher self-reflection and stated that "when educators strive to reflect on their past, present, and future actions and engage in solitary dialogue, their perspectives of work mature" (p. 8). McNiff concluded that action research actively involves teachers as participants in their own educational improvement.

Mettetal (2001) provided a seven-step outline to develop a classroom action research project. These steps included statement of the problem, review of literature, research strategy, data gathering, data analysis, taking action, and sharing the findings. The following sections discuss in detail how this author addressed these steps in a case study in which student perception of an on-line classroom environment and a traditional classroom environment were assessed along with the corresponding learning outcomes.

Statement of the Problem

As indicated by Mettetal (2001), the statement of the problem for a classroom action research project should include a question related to student learning. Incorporating aspects of on-line and traditional classroom teaching could benefit both students and teachers if the learning outcomes are comparable. Little research exists on the evaluation of student perception of on-line versus traditional classroom learning environments and their corresponding learning outcomes, in particular, when the course material was to be delivered simultaneously by the same instructor.

In order to provide a meaningful integration of on-line tools into the traditional classroom environment, two questions were addressed. First, did students obtain the same learning outcomes on-line as they did in a traditional classroom setting? And second, did students perceive their on-line classroom environment to be comparable with a traditional classroom setting? Only when these questions can be answered positively can the incorporation of on-line tools be considered successful.

Review of Literature

The majority of higher education institutions offer courses on-line (Beller & Or, 1998). An increasing number of faculty members across the country include teaching and learning tools provided by the World Wide Web. Ryan, Hodson Carlton, and Ali (1998) spoke of a shift in paradigm in higher education from traditional classroom settings to distance education program delivery via the World Wide Web. They further stated that distance education delivered via on-line technology was also becoming a

viable and convenient alternative for students who are “not so distant.” Of 609 students enrolled in one distance education program, 500 also were enrolled in traditional courses on campus (Guernsey, 1998).

With the evolution of the World Wide Web, on-line teaching and learning has gained a tremendous amount of popularity. New web teaching and learning tools are created at a fast pace to provide better, more efficient, and easier access to learning communities.

In a typical on-line learning environment, each student is provided with access to a virtual classroom. The instructor posts lecture notes and related literature on the Web and organizes classroom discussions that are completed through Web conferencing. In addition, chat group sessions are held and student presentations are posted to websites. Liu and Thompson (1999) found that faculty members are more likely to use a wider variety of educational technologies when exposed to distance learning. For example, Powers, Davis, and Torrence (1998) enriched their on-line teaching and sense of learning community by expecting students to participate regularly and consistently in class discussions on the Web and by requiring responses from each student to their peers’ on-line presentations.

Ryan, Hodson Carlton, and Ali (1998) observed that higher education is moving with deliberate speed toward the electronic classroom and that much has been published on faculty experiences with course delivery through the Web. In spite of the rapid expansion of on-line instruction, little research existed on the evaluation of student perception of on-line versus traditional classroom learning and their corresponding learning outcomes, in particular when on-line learning components are embedded in an otherwise traditional classroom learning environment. Sherry, Fulford, and Zhang (1998,) and Biner, Bink, Huffman, and Dean (1995) added that few evaluation models appear to have been formally assessed or developed in relation to distance education.

Student perception and the quality of on-line programs need to be continuously assessed in order to assure that learning outcomes are increased and do not suffer from using on-line technology. Sherry, Fulford, and Zhang (1998) discussed the positive relationships between students’ satisfaction with instruction and their subsequent success in a course. They continued that the importance of efficiently assessing students’ perception of their instructional environment is an integral role in student learning outcomes. Cheung (1998) added that student feedback is essential for improving the academic quality of on-line learning and helped provide comparative data across different courses to monitor the consistency of standards. However, Dasher-Alston and Patton (1998) stated that much of the faculty and student apprehension surrounding distance learning stems from uncertainty regarding quality. How can colleges and universities assure the quality of distance learning courses and programs? What safeguards can institutions employ to sustain the integrity of their academic programs and how can this non-traditional delivery system help an institution realize its stated educational goal and objectives? These questions created the need to further study outcomes of on-line learning.

Despite the fact that the literature seemed to agree that overall learning outcomes were similar between on-line and traditional classroom instruction (e.g., Spooner, Jordan, Algozzine & Spooner, 1999), quality of on-line learning environments seemed to be under more scrutiny than the quality of traditional classroom environments. Therefore, a deeper understanding of students’ perceptions of on-line and traditional classroom learning and their corresponding learning outcomes was necessary to help improve and better facilitate on-line learning and to better integrate it into the classroom. Combining on-line learning with the traditional classroom could help to diversify teaching and learning alike, address a multitude of learning styles, and increase technological literacy of both faculty and students.

Research Strategy

Mettetal (2001) stated that both quantitative and qualitative methods were appropriate to assess the outcomes of a classroom action research project. Three major research designs could be used for classroom action research projects: pretest-posttest designs, comparisons of similar classes, and case studies. A case study was used to compare on-line teaching versus traditional classroom teaching and their corresponding learning outcomes. As is common in case studies, generalizability is left to the reader. It is up to the reader to determine whether or to what extent the findings may apply to a different context.

Subjects

All students enrolled in TEC 151 Introduction to Industrial Computer Systems in fall semester 2001 (N ª 35) were eligible to participate in the classroom action research project. The subjects for the study were rather homogeneous. Over 90% of the students were male; age and ethnicity were not assessed for this study. Students of TEC 151 were utilized because of the introductory nature of the course. Students’ backgrounds in this course were more uniform than in higher-level classes offered in the same department. All participating subjects completed an informed consent form that had been reviewed and approved by the institution’s human subjects review board, and all procedures for the protection of human subjects were followed. Students who chose not to participate in the study continued to attend the regular classroom sessions. Those students who volunteered to participate (n = 29) were randomly assigned to one of two cohorts, either Cohort A or Cohort B. Random assignment to Cohort A or Cohort B was necessary to prevent students from choosing a preferred method of instruction for a particular content matter.

Protocol

The case study extended over a six-week time period. During the first three weeks, Cohort A studied the first subject matter using an on-line learning method, while Cohort B studied the same subject matter for the same time period using the instructor-led classroom method. During the second three-week section of the project, roles of the cohorts were reversed: Cohort A studied a new subject matter for three weeks using the traditional classroom method, while Cohort B studied the same subject matter for the same time period using an on-line learning method (Figure 1). The reversal of the groups provided each participating student in the class the opportunity to experience both on-line and off-line teaching and learning.

Figure 1: Design of Study

	First three weeks: Subject matter 1	**Second three weeks:Subject matter 2**
Cohort A	Classroom environment (15)	On-line environment (14)
Cohort B	On-line environment (14)	Classroom environment (14)
Total	N= 29	N = 28

At the end of each three-week block, an instrument was administered to gather data on how students perceived their classroom environment. A test that covered the content of the three-week block was also administered at the end of each three-week block. The results of these tests were used as the basis to assess learning outcomes along with the assignments completed during each three-week block.

Data Gathering

Data-gathering strategies commonly used in classroom action research include the use of test scores, teacher evaluations, final course grades, and other progressive classroom assessment techniques. For this study, three instruments were employed to gather data. Instrument 1 measured student perception of classroom environment. A multiple-choice test was developed and administered at the end of each three-week block to assess learning outcomes for each cohort and served as Instrument 2. In addition to the tests, two exercises completed throughout each three-week time period were used to assess learning outcomes (Instrument 3).

Instrument 1

A questionnaire designed by Ryan, Hodson Carlton, and Ali (1998) was used to evaluate students' perceptions of their on-line and off-line classroom environment. Ryan, Hodson Carlton, and Ali determined the reliability of this instrument using Cronbach's alpha (ρ = .76 for the classroom scale and ρ = .82 for the Web module scale) and a test-retest procedure. The eight items included the following.

- Content covered topic.
- Interaction was evident.
- Participation was facilitated.
- Critical thinking was required.
- Time was appropriate for assignments.
- Faculty preparation and expertise was important.
- Required communication skills.
- Required technical skills.

The responses to the items were measured by a Likert-type scale ranging from 1 = strongly agree to 5 = strongly disagree. All participants were physically present to fill out the questionnaire on the last day of each three-week block. Three additional short-answer items asked the respondents what they liked and disliked about the classroom or on-line learning environments, and how those could be improved.

Instrument 2

In addition to students' perception of on-line and off-line learning, a 20-item multiple choice test was administered at the end of each three-week time period to assess learning outcomes. The tests to be completed were identical for both on-line and off-line learners. All test takers were allowed to use their notes and any literature they identified during the three-week block. Students were also allowed to access any information on-line and the appropriate software package during the time of the tests. Students assigned to the traditional classroom cohort took the quiz in a computer laboratory with the appropriate software packages installed and Internet access, and thus had the same access to information as did the on-line students.

Instrument 3

Two exercises per cohort were assigned during each three-week time period. The exercises to be completed were identical for both on-line and off-line learners. The exercises were problem-solving activities designed to address higher level thinking skills. Results of the tests and projects were the basis to assess learning outcomes and determine if they were statistically significant between on-line learners and off-line learners.

Data Analysis

Mettetal (2001) stated that the researcher should be looking for findings with practical significance when analyzing the data, in addition to statistical significance. She further suggested that simple statistical analyses of quantitative data, such as simple t-tests and correlations, were sufficient.

ANOVA's were used to identify statistically significant differences on the eight Likert-type items and on learning outcomes as measured by the tests and exercises. Qualitative responses provided by the short-answer items on Instrument 1 were analyzed for themes and insights.

To determine if there were statistically significant differences between students' perception of the two learning environments, the eight Likert-type items of Instrument 1 were analyzed with an alpha level of .05. One ANOVA was performed for the first three-week time period as students studied the first subject matter (Table 1). The analysis showed one statistically significant difference at the 0.05 alpha level: the item "Interaction was evident" was rated more favorably by off-line students (1.8 vs. 2.46, alpha: .033).

Table 1: First Subject Matter (A = Off-line, B = On-line)

	Cohort A n = 15		Cohort B n = 14		Total N = 29	
	M	SD	M	SD	M	SD
Content	1.87	.64	2.00	1.15	1.93	.90
Interaction	1.80	.56	2.46	.96	2.11	.83
Participation	2.00	.75	2.31	1.10	2.14	.93
Critical thinking	1.73	.79	1.38	.76	1.57	.79
Time appropriate	1.73	1.22	1.69	.94	1.71	1.08
Faculty preparedness	1.67	.61	1.46	.66	1.57	.63
Communication	2.20	.94	2.08	.76	2.14	.84
Technical skills	1.80	.67	2.08	.64	1.93	.66

The next ANOVA was conducted for the second three-week block as students studied a new subject matter (Table 2). Two statistically significant items were identified: the item "Content covered topic" was rated more favorably by off-line students (1.79 vs. 2.71, alpha .029), and the item "Communication skills required" was rated more favorably by on-line students (1.64 vs. 2.43, alpha .05).

Table 2: Second Subject Matter (B = Off-line, A = On-line)

	Cohort B n = 14		Cohort A n = 14		Total N = 28	
	M	SD	M	SD	M	SD
Content	1.79	.89	2.71	1.20	2.25	1.14
Interaction	2.00	1.17	2.50	1.28	2.25	1.23
Participation	2.14	1.16	2.50	1.28	2.32	1.21
Critical thinking	1.71	.91	1.86	1.16	1.79	1.03
Time appropriate	1.50	1.09	2.29	1.26	1.89	1.22
Faculty preparedness	1.79	1.05	1.93	1.07	1.86	1.04
Communication	2.43	1.08	1.64	.92	2.04	1.07
Technical skills	1.71	.825	1.64	1.15	1.68	.98

A third ANOVA was conducted on all on-line learners versus all off-line learners, regardless of the subject matter studied (Table 3). In order to obtain this data, the on-line data collected from Cohort A was combined with the on-line data collected from Cohort B; and the off-line data was combined respectively (Figure 2). This analysis revealed statistically significant differences for the item "Content covered topic." This item was rated more favorably by the off-line cohort (1.83 vs. 2.37, alpha 0.048), and the item "Interaction was evident" was rated more favorably by the off-line cohort (1.90 vs. 2.48, alpha 0.035).

The results from the multiple-choice test instrument indicated a mean score of 16.19 (SD = 5.17) for Cohort A and a mean score of 14.51 (SD = 6.43) for Cohort B. These scores did not reveal any statistically significant differences at a .05 alpha level. Results of the assignments evaluated also indicated a difference (Cohort A = 42.40; Cohort B = 37.71). However, some differences were implied, although not statistically significant; the mean scores for the assignments tended to be lower for on-line students, with a greater standard deviation. Additional data were obtained from Instrument 1 in three short-answer items. Thematic analyses of short answers were used to reflect more systematically on the teaching methods used during the time of the case study.

Table 3: Both Subject Matters Combined

	Off-line n= 29		On-line n = 28		Total N = 57	
	M	SD	M	SD	M	SD
Content	1.83	.75	2.37	1.21	2.09	1.03
Interaction	1.90	.90	2.48	1.12	2.18	1.04
Participation	2.07	.96	2.41	1.18	2.23	1.07
Critical thinking	1.72	.84	1.63	1.00	1.68	.91
Time appropriate	1.62	1.14	2.00	1.14	1.80	1.15
Faculty preparedness	1.72	.841	1.70	.91	1.71	.86
Communication	2.31	1.004	1.85	.86	2.09	.95
Technical skills	1.76	.739	1.85	.94	1.80	.84

Figure 2: Grouping On-line and Traditional Classroom Learners

	On-line	Traditional classroom
First three weeks	Cohort A	Cohort B
Second three weeks	Cohort B	Cohort A
Total:	N = 28	N = 29

The off-line students identified the following constructs: Many off-line students indicated that they enjoyed the face-to-face interaction with the professor and peers, and stated that it was easy to ask questions in the classroom. Some dislikes expressed by students included that the course material was covered too quickly in the classroom and that there was not enough lab time to complete the hands-on assignments. However, these dislikes were not reflected as statistically significantly different from on-line students as assessed by the item "Time available for assignments." A common suggestion for improving the traditional classroom environment was to allocate more time to laboratory exercises and less time to lecturing.

The most common construct on themes identified by the on-line cohort focused on the freedom students enjoyed in regard to the material to be studied. Students enjoyed working from home at their own pace, and the ability to review lectures as many times as they wanted. A few comments on dislikes were related to problems with the technology itself, such as problems using RealPlayer or slow modems; another concern included the lack of direct interaction with the faculty member and a longer wait to have questions answered that arose during the week. The lack of interaction with the faculty member was also reflected in the item "Interaction was evident", which on-line learners rated less favorably than off-line learners on Instrument 1.

The most common suggestion to improve the on-line experience was to include a time once a week or so in class or in the laboratory when students could directly interact with the faculty, rather than on-line.

Taking Action

How could the findings of the study be used to improve teaching strategies? The learning outcomes as measured by the tests and projects did not result in statistically significant differences between on-line and off-line learners. Based on the results of this study, neither teaching method appeared to be more effective than the other and thus does not lead to an obvious choice. Both teaching strategies seemed to be equally effective. Mettetal (2001) suggested in such a scenario that the teacher may choose the strategy that he or she prefers or the one that students prefer. Preferences are an important factor for a faculty member to decide whether or not to teach a course or certain portions of a course on-line. It will heavily depend on the faculty member's motivation, interest, and technological literacy to advance on-line teaching, in particular, since on-line teaching initially requires more faculty time and resources. Teacher self-reflection will be necessary when incorporating on-line technology into a course. Only then will teachers be successful in addressing diverse student learning styles and including student suggestions into the course development. Student suggestions obtained on the first instrument helped to identify a statistically significant difference for the item "Content covered topic" in favor of the traditional classroom method. This issue can be addressed in a revised version of the on-line learning environment. Although this study used the same presentations in both learning environments, the content will be revisited to further identify factors that might have caused the differences in the responses.

The item "Interaction was evident", which was more favorably rated by traditional classroom students for the first subject matter, will also be addressed in a future revised version of the on-line/off-line learning environments. Although on-line students were required to log on to a chat room (synchronously) twice a week for one hour and to use the asynchronous discussion tool at least twice a week, interaction seemed not to be sufficient for on-line learners to rate the item "Interaction was evident" more favorably. These lower ratings will be addressed by finding new and creative ways to use the chat and discussion tools, or by identifying new Web tools that better address student interaction.

Additional data analyses, research, and follow-up studies are needed to continue to successfully incorporate on-line learning into the classroom. Further research could include how previous exposure to computers and distance learning affects learning outcomes. Follow-up studies could assess how perceptions of on-line and off-line learning change over time as technical literacy increases. Additional research could investigate benefits of on-line teaching and learning for on-campus students. Yet other research may address how learning outcomes vary when students have a choice of their teaching and learning environment.

Sharing the Findings

Mettetal's (2001) last step included the sharing of findings. The case study presented in this paper did not only allow the author to reflect on his own teaching and learning style, but it also had the potential to impact faculty members in their efforts to incorporate on-line technology into their industrial teacher education classrooms. The dialog among colleagues throughout the department and the college, initiated by various presentations on campus, encouraged faculty to reflect on their teaching and learning style, and to enrich their teaching portfolio with on-line teaching and learning tools. The author will continue to use the Web as a teaching tool and further research and design successful web-enhancement models for traditional classroom environments.

Conclusions

The classroom action research project presented in this paper was the first of this kind for the author. In addition to branching into the on-line teaching and learning world, the author learned more about his own teaching style, not only in an on-line environment, but also in the traditional classroom. Based on the information provided by the students, the author can now address specific teaching issues in both the traditional classroom and in the virtual classroom. No statistically significant differences in learning outcomes were identified in this case study, thus indicating that students participating in this project learned as well on-line as they did in the traditional classroom setting. The incorporation of on-line teaching and learning tools in the traditional classroom can be considered successful, particularly in light of the similarity of learning outcomes and classroom perceptions. However, the author will continue to research the benefits of on-line teaching and learning and see if the findings of this study can be further corroborated. More research with larger student numbers should be conducted, including the use of variables such as learning style differences. For example, it will be important to investigate if students with certain learning styles do better in an on-line learning environment. The author will also continue to use the Web as a teaching and learning tool, and will try to identify additional creative ways to combine on-line and traditional classroom teaching and learning. What remains to be said is that on-line teaching and learning technology is manifesting itself in the classroom.

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UNIT 8: REFLECTING ON AND REVIEWING THEME 8 AND NEXT STEPS TO CURRICULUM REFORM

Learning Outcomes
By the end of this unit tutors would be able to:
- Identify how to use the action research cycle to strengthen their teaching.
- Identify ways by which trainee teachers could be supported to use action research.
- Discuss steps towards curriculum reform and implementation.
- Identify key needs that will enable them to prepare effectively for curriculum implementation.

Revision Activity (5 minutes)

- As a tutor, why do you need to publish?
- Mention at least two essential ingredients of writing for publication and state why you consider them essential.
- What support would you need to enable you write for publication?

INTRODUCTION

This is the last unit of Theme 8. In the previous units, we covered in detail issues concerning action research. We discussed a wide range of issues including reflective practice, the action research cycle, analysing and making sense of qualitative data, identifying patterns in qualitative data with possible interpretations, developing course outlines based on action research and writing for publications. In this unit, we will briefly review some of the issues already covered and then look at the development and implementation of the new Initial Teacher Education (ITE) curriculum.

Activity 1: Using the Action Research Cycle (40 minutes)

- Read the article below and identify a suitable research problem(s).
- Formulate research questions that could be used to address the problem(s).
- What processes would you go through to collect relevant information? (Identifying respondents, sample size of respondents, getting access to respondents, etc.).
- Indicate how you would get evidence to convince others that the question(s) raised was/were addressed. This is concerned with the evidence you need to answer the research questions.
- How would you ensure that any conclusions you arrive at are reasonably fair and accurate?

Arguments for Using the First Language

By definition, most Ghanaian students are English language learners (ELLs) in that they speak a local dialect at home, but English is the only mode of instruction in the schools (Nguyen, 2009). Research has shown that the use of a child's first language in education enhances linguistic, cognitive, and academic achievement (Baker, 2001; Owu-Ewie, 2006).

The National Association for the Education of Young Children (2010) reported that the loss of children's home language might result in the disruption of family communication patterns. An experiment in bilingual education in Mozambique demonstrated that children benefited greatly from the use of the first language in terms of classroom participation, self-confidence, bilingualism, and literacy in the second language (Kamwangamalu, 2004). Such findings may indicate that the poor academic performance in Ghanaian schools, especially in English proficiency, might be due to a lack of foundation in the child's first language for transfer to the second language (Owu-Ewie, 2006). In the early stages of school, most reading tasks are performed by listening and, as a result, children develop strong listening skills and tend to hold on to those skills even in the later stages of schooling. It is difficult for the Ghanaian child, who is not proficient in English to begin with, to develop such listening skills to aid in reading comprehension proficiency. In addition, young children lacking English language vocabulary can lose interest in education at a critical point of their life.

In Ghanaian society, children who speak English language at home fare better academically than students encountering English at the start of school. This is because the latter group must overcome deficiencies in English while simultaneously maintaining academic progress with students already proficient in English, and many do not succeed (Fry, 2007). However, children who speak a first language other than English at home can have a positive effect on children's English literacy development, and bilingual language skills can positively affect children's educational achievement when the student's linguistic and cultural strengths are not overlooked. Current research indicates that speaking a native language at home in the elementary school years has positive effects on high school completion.

In Ghana, lack of proficiency in reading has been erroneously attributed to constant use of the student's first language. In 1994, the study of Ghanaian languages as a core subject in senior high school was abolished because it was perceived as contributing to the abysmal performance of students in reading and other courses that involve the use of reading comprehension (Edu-Buandoh, 2006). This abysmal performance led to the upgrade of all sectors of education. The educational investment produced high-quality educational facilities and instructors but has not yielded returns in high academic standards, as over 64% of all students read significantly below their grade level (Ghana Education Service, 2010).

Activity 2: Preparing for Curriculum Implementation (40 minutes)

In your group:

a. Discuss and list reasons for curriculum reform in teacher education.
b. Identify the steps taken so far towards the development and implementation of the new Initial Teacher Education (ITE) curriculum.
c. What, in your opinion, is left to be done to make the development and implementation of the new ITE curriculum complete?

REFLECTION (5 MINUTES)

- What impact will action research have on your teaching and trainee teachers' learning?

UNIT 8 - ANNEXES

ANNEXE 8.1 INTRODUCTION TO RATIONALISATION AND OVERVIEW OF THE CURRICULUM FRAMEWORK FOR TEACHER EDUCATION

1. Background

In the past 20 years, there have been numerous minor reforms in teacher education in Ghana, which have had very little impact on children's learning outcomes.

- The DBE curriculum has not adequately responded to the lack of improvement in learning outcomes at the basic school level, strengthening the need for reforms in the teacher education sector in Ghana.
- The Ministry of Education launched the Pre-Tertiary Teacher Professional Development and Management (PTPDM) Policy, which is aimed at streamlining the professional and career progression of teachers in the pre-tertiary sector.
- Additional policy reform initiatives include the development of National Teaching Standards for Pre-service Teacher Education led by the National Teaching Council (NTC).
- The development and delivery of comprehensive programmes of training and materials for college principals, tutors, mentors and students. These programmes are still ongoing and being adapted to take account of the new policy initiatives.
- The development of the Draft National Teacher Education Curriculum Framework (NTECF) was led by the National Council for Teacher Education (NCTE).
- The Curriculum Framework supports system change in teacher education and ultimately education in Ghana to ensure every child's entitlement to effective, engaging and inspirational teachers.

2. Rationale for the Curriculum Framework

- T-TEL was commissioned by the Ministry of Education to lead the process of review of Teacher
- Education in Ghana.
- The core rationale for the Curriculum Framework is that it concentrates on the essential elements a pre-service teacher education curriculum needs to focus on to produce the best teachers, and against which all teacher education curricula, including the DBE, can be reviewed.
- Feedback from key stakeholders from the writing of the Teachers' Standards onwards pointed to a number of issues with the DBE. Specifically, it needs revision in order to:
    - ◊ Fully prepare trainees to teach the basic school curriculum, in particular English, mathematics and science, concentrating on relevant subject and pedagogic knowledge;
    - ◊ Equip trainees to develop pupils' languages (Ghanaian and English) and literacy so all can access the curriculum;
    - ◊ Give higher status to practical teaching experience through supported and assessed teaching in school;
    - ◊ Widen the focus of assessment to include in school learning and assignments as well as examinations; with trainees being assessed against the Teachers' Standards;
    - ◊ Deepen trainees' curriculum knowledge through introducing level specialisms – K-P3, primary, JHS;
    - ◊ Emphasise a more interactive, learner-focused approach to training, modelling good teaching;
    - ◊ Be explicit in addressing vital cross-cutting issues: equity and inclusivity, assessment, core skills, professional values, action research and reflection.
- These essential issues have shaped the National Teachers' Education Curriculum Framework,

which is underpinned by the National Teachers' Standards as the determinant of what a 'good' teacher is:

- ◊ The goal is to ensure that every child's right to teachers who are able to support learning and progress is fulfilled.

3. Creating the Framework

- The National Teacher Education Curriculum Framework (NTECF) has been written by experts in the Teacher Education Community and through National Consultation with all stakeholder groups. The process has been driven by the idea that fundamental change is most likely when there is a shared imperative for change coupled with sustained engagement of stakeholders. There have been three cycles of National Forums coupled with other national events underlying the refining of the Framework by the expert group.
- This process is on-going to include tutors, district officers and others.
- The Third National Forum achieved overwhelming endorsement for the Framework to drive the revision of the Teacher Education Curriculum. Participants were asked - Do you endorse the Framework overall as the appropriate direction to achieve the vision for education? In a written response 98.8% gave their endorsement.
- Who contributed to and endorsed the Framework?
  - ◊ The Technical and Expert committees, Chair Prof. Mohamed Salifu, incl. experts from: MoE, GES, UCC, UEW, UG, UDS, NTC, NCTE, NAB, NCCA, Colleges of Education, USAID Learning Project, and co-opted Civil Society representatives.
  - ◊ Through the National Forum: teachers, trainee teachers, pupils, DEO, Regional Directors of Education, DPs, teacher unions, academics, NGOs.
  - ◊ Thirty-nine out of 40 CoE leaders fully endorsed the Framework.

4. Stakeholders' Shared Vision for the Teacher Education Curriculum

The vision for the teacher education curriculum is as follows:

- To increase numbers of effective, engaging, inspirational teachers who are fully prepared to teach the basic school curriculum, including English, Mathematics and Science;
- To develop all pupils' languages (Ghanaian and English) and literacy, so that they can access the curriculum;
- To provide life-long learning opportunities;
- To offer inclusive, equitable, high quality education.

5. How Can We Achieve this Shared Vision?

- Raise the profile of practical teaching experience through supported and assessed teaching in school.
- Focus on subject knowledge for teaching and pedagogy.
- Focus assessment of trainees on the Teachers' Standards through professional portfolios including evidence from in-school learning; assignments and examination results.
- Move from generalist to level-specific specialism for teacher education.
- Emphasise a more interactive, learner-focused approach to training.
- Be explicit in addressing critical cross-cutting issues: equity and inclusivity, assessment, core skills, professional values, action research and reflection.
- Require high quality CPD for tutors, mentors, and school and college leaders.

(Excerpts from MoE, n.d.)

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ANNEXE 9

PD SESSION - TUTOR SURVEY

Questionnaire Code: 015

A. Answer the questions	Fill in your answers:
1. Please enter your college ID number *Answer must be the Identification Number of the coe you are reporting on*	
2. Please enter the date of the session *Answer must be a date in the following format: day.month.year. Example: 25.01.2018*	
3. Did today's session take place? a. Yes b. No *Choose 1 answer from the list. Example: a*	
4. What subjects do you teach at your institution? a. Mathematics b. Science c. English d. Methodology e. Other *Choose 1 answer from the list. Example: a*	
5. How would you rate the content of today's topic/unit? a. Not at all relevant or useful b. Indifferent about it c. Somewhat relevant and useful d. Very relevant and useful e. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	
6. How likely are you to try the teaching strategies you learned today in class? a. Not likely b. Somewhat likely c. Very likely d. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	

A. Answer the questions	Fill in your answers:
7. How much impact do you think the session will have on the learning of students? a. Very good b. Good c. Minimal d. No Impact e. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	
8. How do you rate the performance of the PDC on how well he/she facilitated the session? a. He/she was not prepared b. He/she was somewhat prepared c. He/she was very prepared d. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	
9. How likely are your students to model these teaching strategies if you use them in class? a. Not likely b. Somewhat likely c. Very likely d. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	
10. In your opinion, what was the level of participation in today's session? a. 75-100% of the tutors were engaged b. 50-75% of the tutors were engaged c. 25-50% of the tutors were engaged d. 0-25% of the tutors were engaged e. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	

B. Prepare your SMS

Enter all your answers. Use a space to separate them.

Example: 015 answer1 answer2 answer3 answer4 answer5 answer6 answer7 answer8 answer9 answer10

C. Send your answers using SMS
Send your SMS to the telephone number: 7000 for MTN users only and 1904 for Airtel, Vodafone & Expresso users (If you have done the training, these numbers should already be saved in your phone).

D. Wait for our reply SMS
You will receive an SMS confirmation or specific error message.

PD SESSION - TUTOR SURVEY

Questionnaire Code: 015

A. Answer the questions	Fill in your answers:
1. Please enter your college ID number *Answer must be the Identification Number of the coe you are reporting on*	
2. Please enter the date of the session *Answer must be a date in the following format: day.month.year. Example: 25.01.2018*	
3. Did today's session take place? a. Yes b. No *Choose 1 answer from the list. Example: a*	
4. What subjects do you teach at your institution? a. Mathematics b. Science c. English d. Methodology e. Other *Choose 1 answer from the list. Example: a*	
5. How would you rate the content of today's topic/unit? a. Not at all relevant or useful b. Indifferent about it c. Somewhat relevant and useful d. Very relevant and useful e. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	
6. How likely are you to try the teaching strategies you learned today in class? a. Not likely b. Somewhat likely c. Very likely d. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	

A. Answer the questions	Fill in your answers:
7. How much impact do you think the session will have on the learning of students? a. Very good b. Good c. Minimal d. No Impact e. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	
8. How do you rate the performance of the PDC on how well he/she facilitated the session? a. He/she was not prepared b. He/she was somewhat prepared c. He/she was very prepared d. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	
9. How likely are your students to model these teaching strategies if you use them in class? a. Not likely b. Somewhat likely c. Very likely d. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	
10. In your opinion, what was the level of participation in today's session? a. 75-100% of the tutors were engaged b. 50-75% of the tutors were engaged c. 25-50% of the tutors were engaged d. 0-25% of the tutors were engaged e. N/A - The session did not happen *Choose 1 answer from the list. Example: a*	

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Enter all your answers. Use a space to separate them.

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D. Wait for our reply SMS
You will receive an SMS confirmation or specific error message.

LIST OF COLLEGES

Name of College of Education	What is the new CoE Unique ID Number
ABETIFI PRESBYTERIAN COLLEGE OF EDUCATION	coe4
ACCRA COLLEGE OFEDUCATION	coe6
ADA COLLEGE OF EDUCATION	coe8
AGOGO PRESBYTERIAN WOMEN'S COLLEGE OF EDUCATION	coe38
AKATSI COLLEGE OF EDUCATION	coe9
AKROKERRI COLLEGE OF EDUCATION	coe34
ATEBUBU COLLEGE OFEDUCATION	coe35
BAGABAGA COLLEGE OF EDUCATION	coe21
BEREKUM COLLEGE OF EDUCATION	coe29
DAMBAI COLLEGE OF EDUCATION	coe15
E.P. COLLEGE OF EDUCATION, AMEDZOFE	coe14
E.P. COLLEGE OF EDUCATION, BIMBILLA	coe20
ENCHI COLLEGE OF EDUCATION	coe24
FOSO COLLEGE OF EDUCATION	coe28
GAMBAGA COLLEGE OF EDUCATION	coe39
GBEWAA COLLEGE OF EDUCATION	coe22
HOLY CHILD COLLEGE OF EDUCATION	coe26
JASIKAN COLLEGE OF EDUCATION	coe10
KIBI COLLEGE OF EDUCATION	coe1
KOMENDA COLLEGE OF EDUCATION	coe23
MAMPONG TECHNICAL COLLEGE OF EDUCATION	coe30
MOUNT MARY COLLEGE OF EDUCATION	coe5
NJAHMADIYYA COLLEGE OF EDUCATION	coe16
OFFINSO COLLEGE OF EDUCATION	coe33
OLA COLLEGE OF EDUCATION	coe27
PEKI COLLEGE OF EDUCATION	coe13
PRESBYTERIAN COLLEGE OF EDUCATION, AKROPONG	coe7
PRESBYTERIAN WOMEN COLLEGE OF EDUCATION, ABURI	coe2
SDA COLLEGE OF EDUCATION	coe3
ST. AMBROSE COLLEGE OF EDUCATION	coe40
ST. FRANCIS COLLEGE OF EDUCATION	coe11
ST. JOHN BOSCO COLLEGE OF EDUCATION	coe19
ST. JOSEPH COLLEGE OF EDUCATION	coe31
ST. LOUIS COLLEGE OF EDUCATION	coe32
ST. MONICA COLLEGE OF EDUCATION	coe37
ST. TERESA COLLEGE OF EDUCATION	coe12
TAMALE COLLEGE OF EDUCATION	coe17
TUMU COLLEGE OF EDUCATION	coe18
WESLEY COLLEGE OF EDUCATION	coe36
WIAWSO COLLEGE OF EDUCATION	coe25

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West African Wisdom: Adinkra Symbols & Meanings

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Production Team

Theme 8 - which is on The Tutor as a Researcher - draws on the Teachers' Standards and the National Teacher Education Curriculum Framework developed under the consultancy of Transforming Teacher Education and Learning (T-TEL) as part of the process of transforming teacher education and learning in Ghana.

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