

Tutor Professional Development Handbook: B.Ed. in Initial Teacher Education - ICT Year 3 Semester 1

HANDBOOK FOR TUTORS



Wisdom, Knowledge
and Prudence





The Government of Ghana



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Foreword

In Ghana we have made great strides in transforming our teacher education system over the past few years. With each passing year the changes brought about through these reforms are maturing, embedding, and sustaining. Once the first B.Ed. graduates from Colleges of Education enter basic school classrooms from 2022 onwards, I am sure that as a nation, we will truly start to see the benefits of these reforms.

The success of national reforms depends on individual tutors and individual teachers working in classrooms across the country every day. The progress that we want to see will only be brought about through the consistent and regular application of the professional knowledge, professional practice and professional values and attitudes set out in the National Teachers' Standards.

This is where the Tutor Professional Development Handbooks have such an important role to play, and it is very pleasing to see the continued development and use of these handbooks as we enter the 3rd Year of the B.Ed. in Initial Teacher Education.

These Handbooks aim to ensure that tutors in Colleges of Education are reflecting critically on their methods of teaching and learning and supporting each other to implement the B.Ed. in line with the National Teacher Education Curriculum Framework and National Teacher Education Assessment Policy. Assessment is one of the areas where we need to pay particular attention as the teacher education reforms matures and is sustained. The National Teacher Education Assessment Policy sets out the range of formative and summative modes and methods of assessment required to ensure that the B.Ed. is both implemented and assessed as planned. Assessment is a key driver of learner behaviour, and we must all ensure that we are familiar with the National Teacher Education Assessment Policy and applying it consistently to ensure that we eliminate the 'chew, pour, pass and forget' syndrome which has infected our education system. These Handbooks pay particular attention to assessment and are an important tool in ensuring that we are all following national policy guidelines correctly and consistently.

This latest set of Professional Development Handbooks, developed by four mentoring universities (University for Development Studies, University of Education, Winneba, University of Ghana and Kwame Nkrumah University of Science and Technology) and tutors from their affiliated Colleges of Education, are the second set of Professional Development Handbooks to be developed since Transforming Teaching, Education & Learning (T-TEL) became a Ghanaian not-for-profit organisation. I would like to take this opportunity to thank both the Ghana Tertiary Education Commission and Mastercard Foundation for making all this possible.

Robin Todd
Executive Director, T-TEL
September 2021

Year Three Semester One
ICT
Tutor Version of Weekly PD sessions

Lesson Topic:

Database Systems and Software development
Web and Mobile Development in Education

Tutor PD Session for Lesson 1 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none">● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s.● Reflection on previous PD Session (Introduction to the course manual/s)● Introduction and overview of the main purpose of the lesson in the course manual/s● Identification of important or distinctive aspects of the lesson/s● Reading and discussion of the introductory sections up to learning outcomes	<p>Introduction</p> <p>1.1 Write one (1) thing you learnt in the last PD session on Application Development in Education/ Data communication and Networking.</p> <p>1.1.1 share what you learnt with the whole group.</p> <p>1.2 Read through the course manual and identify the main features. E.g., How HTML documents are structured – Web and Mobile Dev.</p> <p>ii. Programming with Objects – Database Systems</p> <p>1.3 Read the introductory sections of lesson up to the learning outcomes and their corresponding indicators individually. e.g., Apply the principles of object-oriented programming constructs and software development (<i>NTS 2b, 2c</i>)</p> <p>Distinctive Aspect</p> <p>1.4 Brainstorm on the distinctive aspect of the lessons on Database Systems /Web and Mobile Development for group discussion. i.e.,</p> <p>Database Systems</p> <p>i. Computer Systems</p> <p>ii. Objects in programming</p> <p>Web and Mobile Dev.</p> <p>i. How to use Websites.</p> <p>ii. Technologies of the Web.</p> <p>1.4.1 Pair-Share your responses taking into consideration GESI issues (Gender, Equality, Social inclusivity). i.e., Asking females to take leading roles where applicable.</p>	<p>20 mins</p>

	<p>1.5 Identify and discuss the relationship between <i>CLOs and LIs of lesson one in the different course manuals</i></p> <p><i>Discuss any point that needs clarification</i></p>	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 Using interactive talk for learning engage yourselves in a discussion on the concepts of:</p> <p>Database Systems</p> <p>i. Introduction to programming language (java/C++)</p> <p>Web and Mobile Dev.</p> <p>i. Concept of web technologies.</p> <p>2.2 Write two (2) possible challenges/misconceptions in teaching the concept above for discussion. (e.g., Identify areas in lesson where stereotypes are enforced and addressing these).</p> <p>NB: Programming is meant for Males rather than both gender</p> <p>2.3 In pairs Identify the needed resources for discussion. I.e., Laptop, Java IDE/C++ IDE, java and C++ compilers, Internet Access for presentation and discussion. (Where appropriate let one male and female lead the discussion)</p>	25 mins
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>Teaching, learning and assessment activities</p> <p>3.1 Read the teaching and learning activities of Lesson 1 from the course manual and identify areas that require clarification.</p> <p>3.1.1 <i>Discuss areas identified after the reading that might require clarification from the manual. E.g., why java/C++ programming Language</i></p> <p>3.2 In groups of two discuss how the different activities would be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson 1.</p> <p>3.3 Watch a GESI Responsive YouTube video on:</p> <p>DATABASE SYSTEMS.</p> <p>i. What is Programming Language https://youtu.be/GtgdHzLv4Q</p>	40 mins

	<p>WEB AND MOBILE DEV.</p> <p>i. Understanding of Objects https://youtu.be/ysEN5RaKOIA Etc. to support their teaching in the class</p> <p>3.3.1 Discuss issues arising from the video. Taking into consideration GESI Issues i.e. <i>“Let non-fun-programmer lead the discussion”</i></p> <p>3.4 Tutors should identify where, and which, core and transferable skills that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities.</p> <p>3.2 Read and identify the continuous assessment activities in the manual(s) on STICKY NOTE PAD and identify areas that require clarification especially on NTEAP related activities. E.g., Weighting of assessment component for a programmed developed</p> <p>3.5.1 <i>tutors should focus on subject project and the subject portfolio of NTEAP document. E.g., Taking videos during STS and keep as backups</i></p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification</p> <p>4.2 Identify a critical friend to sit in your class during lesson and report on observation during next PD session.</p> <p>4.3. Read the PD manual on lesson2 and look for relevant materials for the next session.</p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject</p>		

<p>project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>	
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Lesson Topic:

Database Systems and Software Development
 Object Oriented Programming II
 Web and Mobile Development in Education
 Web technologies (CSS)

Tutor PD Session for Lesson 2 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>Introduction</p> <p>Start with an icebreaker.</p> <p>1.1 Reflect on previous PD Sessions with the following guided question:</p> <ol style="list-style-type: none"> i. List any challenges encountered if any. ii. Share your views with the whole group. <p>1.2 Read the introduction, lesson description and the purpose of the lesson in the course manual and indicate how they are related to student teachers' relevant previous knowledge.</p> <p>1.3 In pairs, Identify the important or distinctive aspects of the lesson/s. i.e.</p> <p>DATABASE SYSTEM</p> <ol style="list-style-type: none"> 1. Classes Values and References Structs 2. memory allocation Encapsulation <p>WEB AND MOBILE DEV</p> <ol style="list-style-type: none"> 1. Basic static website 2. Basic syntax of HTML5 <p>1.4 A tutor (both gender) should voluntarily take a leading role by Reading and discuss with the entire group the introductory sections up to learning outcomes of the lesson.</p>	20 mins

	1.5 Take note of issues raised for discussion and how they will address them. <i>E.g., issues with People with visual impairment, and strategies to support learning of these areas in basic schools through STS activities</i>	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 Tutors list the major concepts in the lesson and Share with the whole group:</p> <p>Database System:</p> <ul style="list-style-type: none"> i. Classes Values and References Structs ii. Memory Allocation Encapsulation <p>Web and Mobile Dev.:</p> <ul style="list-style-type: none"> iii. Syntax of HTML 5 iv. Basic HTML tags <p>2.1.1 Discuss the potential misconceptions and barriers with respect to the concepts listed.</p> <p>2.2 In pairs, identify at least two (2) possible challenging areas in teaching of the concepts listed above. Eg., How to write the syntax for HTML 5 in designing a website and Memory allocation Encapsulation in Database for discussion.</p> <p>2.2.1 Explain how these challenges would be overcome.</p> <p>2.3 List the needed inclusive resources for the teaching and learning of the concepts identified in both CoE and basic school classrooms. <i>E.g., a YouTube Video on HTML 5 with a female Instructor presenting, C++ software for Memory Allocation Encapsulation in Database.</i></p>	25 mins
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course 	<p>Teaching, learning and assessment activities for the lesson</p> <p>3.1 Watch these videos on YouTube in pairs on syntax of HTML 5 "https://youtu.be/SmPW4dZuaJY", Memory allocation Encapsulation in Database "https://youtu.be/JFbL5HYQcs8"</p> <p>3.2 Tutors write the syntax down after watching the video and identify areas that requires clarification for group discussion. E.g., Semantics of HTML5</p>	40 mins

<p>assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%)</p> <ul style="list-style-type: none"> Working through one or two activities, 	<p>3.3 <i>Discuss the NTEAP and requirement for course assessment: subject project and subject portfolio.</i> Refer to the NTEAP document and focus on subject portfolio and subject project especially.</p> <p>3.3 Build a professional record (E-Portfolio) on the link watched and the syntax you wrote for future reference.</p> <p>3.4 Tutors discuss how GESI issues i.e., <i>“Female in class appreciating programming”</i> that relate to the teaching and learning activities of the lesson will be addressed.</p> <p>3.5 Identify where, and which, core transferable skills <i>including 21st skills and the use of information technology</i> that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities. <i>E.g., Electronic Portfolio Building.</i></p> <p>3.6 Identify and discuss the resources that will be required for building the Electronic Portfolio. <i>E.g., FOLDER</i> to save the files in.</p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> Identification of any outstanding issues relating to this lesson for clarification Advance preparation In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification</p> <p>4.2 Identify a critical friend who took part in the PD session to sit in your class during lesson and report on observation during next PD session.</p> <p>4.3 Read the PD manual and look for relevant materials for the next session.</p> <p>4.4 Take note of GESI related issues bothering the minds of tutors as well as unanswered questions from the class</p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP</p>	<p>Assessment as Learning: Tutors do a model presentation of their first basic website for students to watch.</p> <p>Assessment as Learning: Student tutors do a presentation of their first basic website after watching the model presentation.</p>	

implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.

NOTE!!

Remind ourselves on *assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions*

Lesson Topic:

Database Systems and Software Development

Object Oriented Programming III

Web and Mobile Development in Education

Cascading Style Sheets (CSS)

Tutor PD Session for Lesson 3 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>1.1 Tell how useful the previous PD session (lesson 2) influenced your teaching, especially the assessment component.</p> <p>1.2 Read through the lesson descriptions, possible barriers, and purpose of the lesson to the whole group.</p> <p>1.3 ‘think, pair and share’ what you consider as the focus of the lesson</p> <p>1.4 ‘think, pair and share’ what they consider as the focus of the lesson. I.e.,</p> <p>Database Systems: i. Encapsulation</p> <p>Web and Mobile Dev: i. Cascading Style Sheet.</p> <p>1.5 Identify and discuss any distinctive aspects of lesson 3</p>	20 mins
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible 	<p>2.1 List the major concepts in lesson 3. E.g.,</p> <p>Database Systems: Object relations with other objects. Web and Mobile Dev: Web interface styling with CSS.</p> <p>2.2 Write out on ‘A4’ sheets, the challenging areas you envisage in teaching the concept(s) identified and</p>	25 mins

<p>challenging areas in teaching of the concept.</p> <ul style="list-style-type: none"> ● Identification of needed resources for the teaching and learning of the concept. 	<p>brainstorm among themselves possible approaches to overcome.</p> <p>2.3 list the needed resources for the teaching and learning of the concepts identified.</p> <p>E.g., Database Systems: Silberschaty, A &Korth, H. F. (2006). Database system concepts (5th ed.). New York: McGraw Hill</p> <p>Web and Mobile Dev.: Saffer, D. (2010). Designing for interaction: Creating smart applications and clever devices. Berkeley, CA: New Riders.</p> <p>2.4 identify and write the crosscutting issues – core and transferable skills, inclusivity, equity and addressing diversity and how the learning outcomes of Lesson 3 apply to the Basic Education Curriculum as indicated by GESI.</p>	
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>3.1 Read through the teaching and learning activities silently. Walk tutors through one or two teaching learning activities.</p> <p>3.2 In pairs, ask tutors to suggest teaching and learning activities for the lesson taking into account GESI issues and refer them to the activities outlined in the course manual after watching these videos on YouTube: https://www.youtube.com/watch?v=6vbgZnQrpbU - Web and Mobile Dev. https://youtu.be/CqIM7JjnAi4 - Database Systems.</p> <p>3.3 Model a presentation of activity using ICT tools and taking into consideration GESI issues (e.g., Both genders taking the leading roles in their groups and the demonstration of the use of ICT tools) in the B. ED and the Basic School Curricula (BSC). NTS 1a, b, c, d, 2b, e, 3b,</p> <p><i>present your findings.</i></p> <p>3.4 Discuss the strategies that must respond to inclusivity and equity- GESI (i.e., ICT as a tool for expanding learning to diverse learners)</p> <p>3.5 Identify where and which, core and transferable skills <i>including 21st century skills and the use of information technology</i> that can be developed or applied in the lesson and how they can help student</p>	<p>40 mins</p>

	teachers to support basic school learners to develop these skills through STS activities.	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>4.1 Individually, identify any outstanding issues relating to Lesson 3 for clarification.</p> <p>4.2 Have a concrete plan for teaching lesson 3</p> <p>4.3 Identify a critical friend who took part in the PD session to sit in your class during the lesson and report on observation during the next PD session.</p> <p>4.4 Read lesson 4 from the PD manual and look for relevant materials for the next session.</p>	5 mins
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>		

Lesson Topic:

Database Systems and Software Development

Understanding Desktop Applications I

Web and Mobile Development in Education

Web technologies (Apache Server)

Tutor PD Session for Lesson 4 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
1. Introduction / lesson overview <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>1.1 Write one (1) thing they learnt in their last PD session on Object-Oriented Programming II/Cascading Style Sheet.</p> <p>1.1.1 Ask tutors to share what they have learnt with the whole group.</p> <p>1.2 Read through the course manual and identify the main features. e.g., lesson description</p> <p>1.3 Read the introductory sections of lesson 4 up to the learning outcomes and their corresponding indicators individually.</p> <p>e.g., Design and develop user interfaces to retrieve and present data and information. (NTS 2b, 2c) – Database Systems / Apply the concepts of web-based systems development – Web and Mobile Dev.</p> <p>Distinctive Aspect</p> <p>1.4 Find distinctive aspect of the lessons on Database Systems /Web and Mobile Development for group discussion.</p> <p>ie. Database Systems:</p> <p style="padding-left: 20px;">i. Web Servers</p> <p>Web and Mobile Dev:</p> <p style="padding-left: 20px;">i. Designing Windows forms</p> <p>1.4.1 In groups (with both gender in each group if possible) and share responses</p>	20 mins

	<p>1.5 Identify and discuss the relationship between <i>CLOs and LIs of lesson 4 in the different course manuals</i></p> <p><i>Discuss any point that needs clarification</i></p>	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 Identify the concepts of lesson 4. I.e., Web Server and Desktop Applications</p> <p>2.1.1 Explore on the concepts.</p> <p>2.2 Write one (1) possible challenges/misconceptions in teaching the concept above for discussion. (e.g., an ergonomic keyboard for typing)</p> <p>2.3 Identify the needed resources for discussion i.e., Software e.g., Adobe Dreamweaver, notepad.</p> <p><i>NB: Make sure the resources are enough, suitable, and installed on all computers for learners (males, females and physically challenged, ergonomic keyboard)</i></p>	25 mins
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>3.1 Read the teaching and learning activities of lesson 4 from the course manual and identify areas that require clarification. E.g., Servers</p> <p>3.2 In groups, discuss how the different activities would be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson 4</p> <p>3.3 Identify where, and which, core and transferable skills that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities.</p> <p>3.4 Read and identify the assessment activities in the manual(s) on a flip chart and identify areas that require clarification especially on NTEAP related activities.</p> <p>3.4.1 Focus on <i>subject project and the subject portfolio of NTEAP document</i></p>	40 mins

<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification. E.g., Difference between multiple document interface and GUI.</p> <p>4.2 Identify a critical friend to sit in your class during lesson and report on observation during next PD session.</p> <p>4.3 Read the PD manual on lesson 5 and look for relevant materials for the next session.</p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>		

Lesson Topic:

Database Systems and Software Development
 Understanding Desktop Applications II
 Web and Mobile Development in Education
 Client-Side Scripting in JavaScript I

Tutor PD Session for Lesson 5 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. (What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>1.1 Write one (1) thing you learnt in the last PD session on Application Development in Education/ Data communication and Networking</p> <p>1.1.1 share what you learnt with the whole group.</p> <p>1.2 Read through the course manual and identify the main features. e.g., lesson description</p> <p>1.3 Read the introductory sections of lesson up to the learning outcomes and their corresponding indicators individually. e.g., Apply the principles of object-oriented programming constructs and software development (<i>NTS 2b, 2c</i>)</p> <p>Distinctive Aspect</p> <p>1.4 Brainstorm on the distinctive aspect of the lessons on Database Systems /Web and Mobile Development for group discussion. i.e.,</p> <p>Database Systems i. Console-Based application</p> <p>Web and Mobile Dev i. Sever Scripts</p> <p>1.4.1. Pair-share your responses taking into consideration GESI issues (Gender, Equality, Social inclusivity). i.e., Asking females to take leading roles.</p> <p>1.5 Identify and discuss the relationship between <i>CLOs and Lis of lesson one in the different course manuals</i></p> <p><i>Discuss any point that needs clarification</i></p>	20 mins

<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 List and share the major concepts in the lesson.</p> <p>2.1.1 Discuss the major concepts i.e.,</p> <p>Database Systems:</p> <ul style="list-style-type: none"> i. Windows Service ii. Console & Graphical User Interface (GUI) applications <p>Web and Mobile Dev:</p> <ul style="list-style-type: none"> i. Scripting <p>2.3 Write two (2) possible challenges/ misconceptions in teaching the concept above for discussion. (e.g., Identify areas in lesson where stereotypes are enforced and addressing these).</p> <p>2.3 In pairs Identify the needed resources for discussion i.e., Laptop, Java IDE/C++ IDE, java and C++ compilers, Internet Access for presentation and discussion. (Let one male and female lead the discussion)</p>	<p>25 mins</p>
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>Teaching and Learning Activities</p> <p>3.1 Read the teaching and learning activities of Lesson 1 from the course manual and identify areas that require clarification.</p> <p>3.1.1 <i>Discuss areas identified after the reading that needs clarification. E.g., Why choose console program over graphical program.</i></p> <p>3.2 In groups of two discuss how the different activities would be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson 5.</p> <p>3.3 Watch a YouTube video on:</p> <p>Web and Mobile Dev.</p> <ul style="list-style-type: none"> i. JavaScript: https://youtu.be/c-I5S_zTwAc <p>Database Systems:</p> <ul style="list-style-type: none"> i. Java https://youtu.be/jUEOWVjnIR8 <p>3.3.1 Discuss issues arising from the video. Taking into consideration GESI Issues i.e. <i>“Let non-fun-programmers lead the discussion”</i></p> <p>3.4 Identify where, and which, core and transferable</p>	<p>40 mins</p>

	<p>skills that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities.</p> <p>3.5 Read and identify the assessment activities in the manual(s) on STICKY NOTE PAD and identify areas that require clarification especially on NTEAP related activities. E.g. How to assess a console programmed developed.</p> <p>3.5.1 focus on subject <i>project and the subject portfolio of NTEAP document</i></p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification. E.g., Which IDE to use for program development.</p> <p>4.2 Identify a critical friend to sit in your class during lesson and report on observation during next PD session.</p> <p>4.3 Read the PD manual on lesson 6 and look for relevant materials for the next session.</p>	5 mins
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>		

Lesson Topic:**Database systems**

Database Concepts and Design I

Web and mobile development

Client-side scripting in JavaScript II

Tutor PD Session for Lesson 6 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>Introduction: <i>Begin with an Icebreaker:</i></p> <p>1.1 Write two (2) things as a recap on the previous lesson on lesson 5 for discussion in your small group:</p> <p>Database systems</p> <p>i. Desktop Applications II</p> <p>Web and Mobile Development</p> <p>i. Basic JavaScript syntax</p> <p>1.2 Read through the course manual and identify the main features of the course description.</p> <p>e.g., Integrated development tools, software development kits</p> <p>1.3 Individually read the introductory sections of lesson 6 up to the learning outcomes and their corresponding indicators.</p> <p><i>Distinctive Aspects</i></p> <p>1.4 Indicate into writing the distinctive aspects the lessons. E.g.,</p> <p>Database Systems</p> <p>i. The concepts and Uses of Databases as well as File-based approach vs. Database Approach.</p>	20 mins

	<p>Web and Mobile Applications</p> <p>i. Explain Loops, Functions, Browser objects, Events in JavaScript.</p> <p>1.5 Share your responses with the small group taking into consideration GESI issues. i.e. <i>Where appropriate let females take leading roles.</i></p> <p>1.6 Identify and discuss the relationship between CLOs and LIs of lesson 6 in the different course manuals.</p> <p><i>Discuss any point that needs clarification</i></p>	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 interactively, Identify and discuss the concepts in the two course manuals. i.e.</p> <p>Database Systems</p> <p>i. Uses of Databases as well as File based approach vs. Database Approach</p> <p>Web and Mobile Dev.</p> <p>i. Loops, Functions, Browser objects, Event.</p> <p>2.2 Write at least one possible challenge/ misconception in teaching the concept above for discussion, (e.g., Identify areas in lesson where stereotypes are enforced) and address them.</p> <p>2.3 Identify the needed resources for the topics in lesson 6 for discussion i.e., Laptop, compilers, Internet Access for presentation and discussion.</p>	<p>25 mins</p>
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: 	<p>Teaching, learning and assessment</p> <p>3.1 Read the teaching and learning activities of lesson 6 from the course manuals and identify areas that require clarification. E.g., loops.</p> <p>3.2 Discuss in groups how the different activities identified would be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson.</p> <p>3.3 Watch a GESI Responsive YouTube video on:</p>	<p>40 mins</p>

<p>subject project (30%), subject portfolio (30%) and end of semester examination (40%)</p> <ul style="list-style-type: none"> ● Working through one or two activities, 	<p>DATABASE SYSTEMS</p> <p>i. Uses of Databases as well as File based approach vs. Database Approach https://youtu.be/4apzdDa6MoM</p> <p>WEB AND MOBILE DEV</p> <p>i. The concepts of Loops, Functions, Browse, objects, Events. https://youtu.be/EI7sN1dDwcY</p> <p>3.4 Discuss issues arising from the videos. Taking into consideration GESI Issues i.e., <i>“given equal opportunities to both males and females to share their views if applicable”</i></p> <p>3.5 In pairs, identify where, and which core and transferable skills, including 21st century skills and the use of information technology tools can be developed or applied in the lesson and demonstrate how they can help student teachers to support basic school learners to develop these skills through STS activities</p> <p>3.6 Identify the assessment activities in the manual(s) on a flip chart and identify areas that require clarification especially on NTEAP related activities.</p> <p>The focus should be on subject project and the subject E-portfolio of NTEAP document</p>	
<p>3. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Identify any outstanding issues relating to the lesson for clarification. E.g., Objects.</p> <p>4.2 Identify a critical friend in your related discipline to sit in, observe your lesson and report on observation, during next PD session.</p> <p>4.3 Read the PD manual on lesson 7 and find relevant materials for the next session.</p>	<p>5 mins</p>

Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.

Lesson Topic:**Database systems**

Database Concepts and Design II

Web and mobile development

Writing mobile Applications

Tutor PD Session for Lesson 7 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
1. Introduction / lesson overview <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	Introduction <p>1.1 Write on a flipchart your experiences (Successes and challenges) as you taught Lesson6 after the PD Session and present your views.</p> <p>1.2 Tutors who observed lesson 6 share their experiences and how these experiences influenced their teaching.</p> <p>1.3 Read through the course manual and identify the main features of lesson 7. <i>e.g., Design, create, implement, and query a database. (NTS 2b, 2c, 3b, 3c, 3d, 3e, 3h, 3i, 3k, 3n, 3p NTECF: Pillars 1, 2 & 3 crosscutting issues; Core skills, Assessment, Professional values, and attitudes</i></p> <p>1.4 Read and discuss the introductory sections (up to Learning Outcomes (LOs) and their corresponding indicators in pairs. <i>E.g., Build a professional record to reflect student teacher’s accomplishments, skills, experiences, learning and attributes NTS: 1a, 1d, 2c,2e / NTECF: Pillar 1& 3</i></p> <p>1.5 Identify the distinctive aspects of the lessons for group discussion including the vocabulary and fundamental concepts related to the components of the front matter and how the students' relevant previous knowledge can help them.</p> <p>i.e. Database System</p> <p>i. Explain Data Normalization</p>	20 mins

	<p>Web and Mobile</p> <ul style="list-style-type: none"> i. XCode ii. Playground iii. Variables iv. Constants 	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 list the major concepts in the lesson from the manual and share your list with the small group. e.g., Explanation to the below concepts with examples</p> <ul style="list-style-type: none"> i. Relational database ii. Variables iii. Constants <p>2.2 Using Interactivity, write one (1) possible challenge or misconception in teaching the concept above for discussion. (e.g., Identify areas in lesson where stereotypes are enforced and addressing these).</p> <p>2.3 list the needed inclusive resources for the teaching and learning of the concepts identified in both CoE and basic school classroom. E.g., gender-responsive video from YouTube on the concepts Java software, laptop.</p>	<p>25 mins</p>
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>Teaching, learning and assessment</p> <p>3.1 Read silently the teaching and learning activities of lesson seven from the course manual and identify areas that require clarification and discussion. <i>NB: Lead tutors to discuss areas identified after the silent reading that needs clarification.</i></p> <p>3.2 Discuss how different activities would be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson 7.</p> <p>3.3 Watch videos to build an understanding of Database Systems/Web and Mobile Dev.</p> <ul style="list-style-type: none"> i. Data Normalization. ii. The xCode Playground <p>3.4 Please discuss issues arising from the video. Taking into consideration GESI Issues (using mixed abilities)</p>	<p>40 mins</p>

	<p>3.5 Discuss how you will ensure that all the teaching and learning activities are GESI responsive. And how would these activities be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson</p> <p>3.6 Read to identify where, and which, core and transferable skills <i>including 21st skills and the use of information technology</i> that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities.</p> <p>3.7 Identify the assessment activities in the manual(s) on flip chat and identify areas that require clarification especially on NTEAP related activities.</p> <p><i>The focus should be encouraging the students to build subject project and the subject portfolio in line with NTEAP document.</i></p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review</p> <p>4.1 <i>Identify any outstanding issues relating to the lesson for clarification. E.g., XCode</i></p> <p>4.2 <i>Invite a critical friend from the same related area to sit in your class during lesson and report on observation during next PD session.</i></p> <p>4.3 <i>Read the PD manual on lesson 6 and find relevant materials for the next session.</i></p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring subject project, subject portfolio preparation and development are explicitly</p>		

addressed in the PD sessions.	
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Database System

Database Concepts and Designs III

Web and Mobile Development

App Development in Swift I

Tutor PD Session for Lesson 8 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none">● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s.● Reflection on previous PD Session (Introduction to the course manual/s)● Introduction and overview of the main purpose of the lesson in the course manual/s● Identification of important or distinctive aspects of the lesson/s● Reading and discussion of the introductory sections up to learning outcomes	<p>Introduction: <i>Begin the lesson with an Ice Breaker.</i></p> <p>1.1 Interactively, review and reflect on the previous PD Session Lesson7 and how useful it was on lessons taught. <i>i.e., data normalization and understanding on the XCode Playground, Variables and Constants</i></p> <p>1.2 Tutors who observed Lesson7 to share their experiences and the impacts when facilitating in class.</p> <p>1.3 Read the introduction, lesson description and the purpose of lesson 8 in the course manual and indicate how they are related to student teachers' relevant previous knowledge</p> <p>1.3 Identify the distinctive aspects of the lesson/s. i.e.</p> <p>Database System</p> <ul style="list-style-type: none">i. Modelled database in a Database Management System. <p>WEB AND MOBILE DEV</p> <ul style="list-style-type: none">i. Decision Structuresii. Loops <p>1.4 A female tutor (if any) should take a leading role by Reading and discuss with the entire group the introductory sections up to learning outcomes of the lesson.</p>	20 mins

	<p>1.5 Take Note of issues that may arise for discussion and how you will address them. <i>E.g., When a student shows no interest in programming as a course of study.</i></p> <p>And, strategies to support learning of these areas in basic schools through STS activities.</p>	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1. Identify the major concepts in the lesson for whole group discussion. i.e.,</p> <p>Database System</p> <p>i. Entity Relationship Diagrams.</p> <p>WEB AND MOBILE DEV</p> <p>i. Decision Structures ii. Loops</p> <p>2.2 Identify the possible challenging areas in teaching of the concept above.</p>	<p>25 mins</p>
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>Teaching, learning and assessment activities</p> <p>3.1 Watch these gender-responsive videos, and guides student teachers to write and present in groups afterwards.</p> <p>Database Systems https://youtu.be/obb7SIUmKQE</p> <p>Web and Mobile Dev https://youtu.be/21l11_9Osd0</p> <p>3.2 Write down the syntax after watching the video and identify areas that requires clarification for group discussion.</p> <p>3.3 <i>Discuss the NTEAP and requirements for course assessment: subject project and subject portfolio.</i></p> <p>3.3.1 Build a professional record (E-Portfolio) on the link watched and the syntax they wrote for future reference.</p> <p>3.4 Discuss how GESI issues like “equal distributing of question to both genders” will relate to the teaching</p>	<p>40 mins</p>

	<p>and learning activities of the lesson will be addressed.</p> <p>3.5 In pairs, identify where, and which, core transferable skills including 21st century skills and the use of information technology that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities. E.g., Electronic Portfolio Building.</p> <p>3.6 Identify and discuss the resources that will be required for building the Electronic Portfolio. E.g., Folder to save files in.</p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification.</p> <p>4.2 Identify a critical friend who took part in the PD session to sit in your class during lesson and report on observation during next PD session.</p> <p>4.3 Read the PD manual and look for relevant materials for the next session.</p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>		

Lesson Topic:
Database Systems and Software Development
 Database Implementation I
Web and Mobile Development in Education
 App Development in Swift II

Tutor PD Session for Lesson 9 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>1.1 Write one (1) thing you learnt in the last PD session on Application Development in Education/ Data communication and Networking</p> <p>1.1.1 share what you learnt with the whole group.</p> <p>1.2 Read through the course manual and identify the main features. e.g., lesson description</p> <p>1.3 Read the introductory sections of lesson up to the learning outcomes and their corresponding indicators individually. <i>e.g., Apply the principles of object-oriented programming constructs and software development (NTS 2b, 2c)</i></p> <p>Distinctive Aspect</p> <p>1.4 Brainstorm on the distinctive aspect of the lessons on Database Systems /Web and Mobile Development for group discussion. <i>i.e., Database Systems</i> <i>i. Structured Query Language</i></p> <p>Web and Mobile Dev <i>i. Swift programming language</i></p> <p>1.4.1. Let tutors’ pair-share their responses taking into consideration GESI issues (Gender, Equality, Social inclusivity). <i>i.e., Asking females to take leading roles.</i></p> <p>1.5 Identify and discuss the relationship between CLOs and LIs of lesson one in the different course manuals <i>Discuss any point that needs clarification</i></p>	20 mins

<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 List and share the major concepts in the lesson.</p> <p>2.1.1 Discuss the major concepts.</p> <p>2.2 Write two (2) possible challenges/ misconceptions in teaching the concept above for discussion. (e.g., Identify areas in lesson where stereotypes are enforced and addressing these).</p> <p>2.3 In pairs Identify the needed resources for i.e., Laptop, XCode, My SQL, Internet Access for presentation and discussion. (Let one male and female lead the discussion).</p>	<p>25 mins</p>
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>Teaching and Learning Activities</p> <p>3.1 Read the teaching and learning activities of Lesson 1 from the course manual and identify areas that require clarification. E.g., Structured Query.</p> <p>3.1.1 <i>Discuss areas identified after the reading that needs clarification.</i></p> <p>3.2 In groups of two discuss how the different activities would be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson 5.</p> <p>3.3 watch a YouTube video on:</p> <p>Web and Mobile Dev. i. Swift: https://youtu.be/dWQuOj1bnN8</p> <p>Database Systems: i. SQL https://youtu.be/27axs9dO7AE</p> <p>3.3.1 Discuss issues arising from the video. Taking into consideration GESI Issues i.e. “Let non-fun-programmers lead the discussion”</p> <p>3.4. Identify where, and which, core and transferable skills that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities.</p>	<p>40 mins</p>

	<p>3.5 Read and identify the assessment activities in the manual(s) on <i>sticky note pad</i> and identify areas that require clarification especially on NTEAP related activities.</p> <p>3.5.1 focus on subject <i>project and the subject portfolio of NTEAP document</i></p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification</p> <p>4.2 Identify a critical friend to sit in your class during lesson and report on observation during next PD session.</p> <p>4.3. Read the PD manual on lesson 10 and look for relevant materials for the next session.</p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>		

Lesson Topic:
Database Systems and Software Development
 Database Implementation II
Web and Mobile Development in Education
 User Interactions

Tutor PD Session for Lesson 10 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>1.1 Write one (1) thing you learnt in the last PD session on Application Development in Education/ Data communication and Networking</p> <p>1.1.1 share what you learnt with the whole group.</p> <p>1.2 Read through the course manual and identify the main features. E.g., lesson description</p> <p>1.3 Read the introductory sections of lesson up to the learning outcomes and their corresponding indicators individually. <i>e.g., Apply the principles of object-oriented programming constructs and software development (NTS 2b, 2c)</i></p> <p>Distinctive Aspect</p> <p>1.4 Brainstorm on the distinctive aspect of the lessons on Database Systems /Web and Mobile Development for group discussion.</p> <p>i.e., Database Systems</p> <p style="padding-left: 20px;">i. Stored Procedures</p> <p>Web and Mobile Dev</p> <p style="padding-left: 20px;">i. Number formatters (Swift)</p> <p>1.4.1. Let tutors pair-share their responses taking into consideration GESI issues (Gender, Equality, Social inclusivity). i.e., Asking females to take leading roles.</p>	20 mins

	<p>1.5 Identify and discuss the relationship between <i>CLOs and Lis of lesson one in the different course manuals</i></p> <p>Discuss any point that needs clarification</p>	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 List and share the major concepts in the lesson.</p> <p>2.1.1 Discuss the major concepts</p> <p>2.3 Write two (2) possible challenges/ misconceptions in teaching the concept above for discussion. (e.g., Identify areas in lesson where stereotypes are enforced and addressing these).</p> <p>2.3 In pairs Identify the needed resources for i.e., Laptop, XCode. (Let one male and female lead the discussion)</p>	<p>25 mins</p>
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>Teaching and Learning Activities</p> <p>3.1 Read the teaching and learning activities of Lesson 1 from the course manual and identify areas that require clarification.</p> <p>3.1.1 Discuss areas identified after the reading that needs clarification.</p> <p>3.2 In groups of two discuss how the different activities would be carried out in both CoE and basic school classroom to achieve the Los and the Lis of the course manual for lesson 10.</p> <p>3.3 Discuss in groups:</p> <p>Web and Mobile Dev.</p> <p>i. Swift number formatters</p> <p>Database Systems:</p> <p>i. Stored Procedures</p> <p>3.3.1 Present your results taking into consideration GESI Issues i.e. <i>“Let non-fun-programmers lead the discussion”</i></p> <p>3.4 Identify where, and which, core and transferable skills that can be developed or applied in the lesson</p>	<p>40 mins</p>

	<p>and how they can help student teachers to support basic school learners to develop these skills through STS activities.</p> <p>3.5 Read and identify the assessment activities in the manual(s) on sticky note pad <i>and</i> identify areas that require clarification especially on NTEAP related activities.</p> <p>3.5.1 focus on subject <i>project and the subject portfolio of NTEAP document</i></p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification</p> <p>4.2 Identify a critical friend to sit in your class during lesson and report on observation during next PD session.</p> <p>4.3 Read the PD manual on lesson 11 and look for relevant materials for the next session.</p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>		

Lesson Topic:
Database Systems and Software Development
 Database Implementation III
Web and Mobile Development in Education
 Advanced UI Interactions

Tutor PD Session for Lesson 11 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>1.1 Write one (1) thing you learnt in the last PD session on Application Development in Education/ Data communication and Networking</p> <p>1.1.1 share what you learnt with the whole group.</p> <p>1.2 Read through the course manual and identify the main features. e.g., lesson description</p> <p>1.3 Read the introductory sections of lesson up to the learning outcomes and their corresponding indicators individually. <i>e.g., Apply the principles of object-oriented programming constructs and software development (NTS 2b, 2c)</i></p> <p>Distinctive Aspect</p> <p>1.4 Brainstorm on the distinctive aspect of the lessons on Database Systems /Web and Mobile Development for group discussion.</p> <p>i.e., Database Systems</p> <p style="padding-left: 20px;">i. Database connection</p> <p>Web and Mobile Dev</p> <p style="padding-left: 20px;">i. User interface</p> <p>1.4.1. Let tutors pair-share their responses taking into consideration GESI issues (Gender, Equality, Social inclusivity). i.e., Asking females to take leading</p>	20 mins

	<p>roles.</p> <p>1.5 Identify and discuss the relationship between <i>CLOs and LIs of lesson one in the different course manuals</i></p> <p>Discuss any point that needs clarification</p>	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 List and share the major concepts in the lesson.</p> <p>2.1.1 Discuss the major concepts</p> <p>2.2 Write two (2) possible challenges/ misconceptions in teaching the concept above for discussion. (e.g., Identify areas in lesson where stereotypes are enforced and addressing these).</p> <p>2.3 In pairs Identify the needed resources for discussion i.e., Laptop, Java IDE/C++ IDE, java and C++ compilers, Internet Access for presentation and discussion. (Let one male and female lead the discussion)</p>	25 mins
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>Teaching and Learning Activities</p> <p>3.1 Read the teaching and learning activities of Lesson 1 from the course manual and identify areas that require clarification.</p> <p>3.1.1 Discuss areas identified after the reading that needs clarification.</p> <p>3.2 In groups of two discuss how the different activities would be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson 11.</p> <p>3.3 Discuss how GESI issues that relate to the teaching and learning activities of the lesson will be addressed.</p> <p>3.4. Identify where, and which, core and transferable skills that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities.</p>	40 mins

	<p>3.5 Read and identify the assessment activities in the manual(s) on sticky note pad and identify areas that require clarification especially on NTEAP related activities.</p> <p>3.5.1 focus on subject project and the subject portfolio of NTEAP document</p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification</p> <p>4.2 Identify a critical friend to sit in your class during lesson and report on observation during next PD session.</p> <p>4.3 Read the PD manual on lesson 12 and look for relevant materials for the next session.</p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>		

Lesson Topic:**Database Systems and Software Development**

Verification and Systems Testing

Web and Mobile Development in Education

Advanced UI Interactions – View Controllers II

Tutor PD Session for Lesson 12 in the Course Manual

Focus: the bullet points provide the frame for what is to be done. The guidance notes in italics identify the prompt the SL/HoD needs and each one must be addressed	Guidance Notes on Tutor Activity during the PD Session. What PD Session participants (Tutors) will do during each state of the session)	Time in session
<p>1. Introduction / lesson overview</p> <ul style="list-style-type: none"> ● Overview of subject/s age phase/s to be covered in this PD session and how it will be organised. Including guidance on grouping tutors according to the subject/s, age phase/s. ● Reflection on previous PD Session (Introduction to the course manual/s) ● Introduction and overview of the main purpose of the lesson in the course manual/s ● Identification of important or distinctive aspects of the lesson/s ● Reading and discussion of the introductory sections up to learning outcomes 	<p>1.1 Write one (1) thing you learnt in the last PD session on Application Development in Education/ Data communication and Networking</p> <p>1.1.1 share what you learnt with the whole group.</p> <p>1.2 Read through the course manual and identify the main features. e.g., lesson description</p> <p>1.3 Read the introductory sections of lesson up to the learning outcomes and their corresponding indicators individually. e.g., Apply the principles of object-oriented programming constructs and software development (<i>NTS 2b, 2c</i>)</p> <p>Distinctive Aspect</p> <p>1.4 Brainstorm on the distinctive aspect of the lessons on Database Systems /Web and Mobile Development for group discussion.</p> <p>i.e., Database Systems</p> <p style="padding-left: 20px;">i. Debugging</p> <p>Web and Mobile Dev</p> <p style="padding-left: 20px;">i. View Controllers</p> <p>1.4.1. Let tutors pair-share their responses taking into consideration GESI issues (Gender, Equality, Social</p>	<p>20 mins</p>

	<p>inclusivity). i.e., Asking females to take leading roles.</p> <p>1.5 Identify and discuss the relationship between CLOs and LIs of lesson one in the different course manuals</p> <p>Discuss any point that needs clarification</p>	
<p>2. Concept Development (New learning likely to arise in this lesson):</p> <ul style="list-style-type: none"> ● Identification and discussion of concepts ● Identification of possible challenging areas in teaching of the concept. ● Identification of needed resources for the teaching and learning of the concept. 	<p>Concept Development</p> <p>2.1 List and share the major concepts in the lesson.</p> <p>2.1.1 Discuss the major concepts</p> <p>2.2 Write two (2) possible challenges/ misconceptions in teaching the concept above for discussion. (e.g., Identify areas in lesson where stereotypes are enforced and addressing these).</p> <p>2.3 In pairs Identify the needed resources for discussion i.e., Laptop i.e., Laptop, XCode. (Let one male and female lead the discussion)</p>	25 mins
<p>3. Teaching, learning and assessment activities for the lesson</p> <ul style="list-style-type: none"> ● Reading of teaching and learning activities and identification of areas that require clarification ● Reading of assessment opportunities and ensuring they are aligned to the NTEAP and required course assessment: subject project (30%), subject portfolio (30%) and end of semester examination (40%) ● Working through one or two activities, 	<p>Teaching and Learning Activities</p> <p>3.1 Read the teaching and learning activities of Lesson 1 from the course manual and identify areas that require clarification.</p> <p>3.1.1 <i>Discuss areas identified after the reading that needs clarification.</i></p> <p>3.2 In groups of two discuss how the different activities would be carried out in both CoE and basic school classroom to achieve the LOs and the LIs of the course manual for lesson 12.</p> <p>3.3 watch a YouTube video on:</p> <p>Web and Mobile Dev. i. Swift: https://youtu.be/AiKBxiHdFYo</p> <p>Database Systems: i. Java https://youtu.be/lj5nnGa_Dlw</p> <p>3.3.1 Discuss issues arising from the video. Taking into</p>	40 mins

	<p>consideration GESI Issues i.e. <i>“Let non-fun-programmers lead the discussion”</i></p> <p>3.4 Identify where, and which, core and transferable skills that can be developed or applied in the lesson and how they can help student teachers to support basic school learners to develop these skills through STS activities.</p> <p>3.5 Read and identify the assessment activities in the manual(s) on sticky note pad and identify areas that require clarification especially on NTEAP related activities.</p> <p>3.5.1 focus on subject <i>project and the subject portfolio of NTEAP document</i></p>	
<p>4. Evaluation and review of session:</p> <ul style="list-style-type: none"> ● Identification of any outstanding issues relating to this lesson for clarification ● Advance preparation ● In the case of unresolved issues 	<p>Evaluation and review of session</p> <p>4.1 Individually, identify any outstanding issues relating to the lesson for clarification</p>	<p>5 mins</p>
<p>Course assessment in accordance with the NTEAP: SWL need to review assessment in the course manual to ensure it complies with NTEAP implementation and the 60% continuous assessment and 40 % End of semester examination. This means ensuring: subject project, subject portfolio preparation and development are explicitly addressed in the PD sessions.</p>		

The PD session check list: supporting B.Ed. implementation.

In some cases, to support implementation the PD sessions may need to add more detail to what is in the course manuals

What to Include in PD sessions: Check list	Checked and In Place.
<p>Course introductions and conclusions</p> <ul style="list-style-type: none"> • The first PD session of each semester introduces the course manual/s and course expectations to student teachers. • The final PD session provides the opportunity to review student teachers learning from the course 	
<p>Prior knowledge: Points for tutors on assessing or activating student teachers' prior knowledge.</p>	
<p>Basic School Curriculum: when topics for student teachers are from the Basic School Curriculum the PD session makes explicit links.</p>	
<p>CLO: relevant to the session to be introduced</p>	
<p>Lesson Learning outcomes and indicators. PD sessions provide opportunities for tutors to model interactive approaches to teaching and learning they will use to support student teachers</p>	
<p>Integration of subject specific content and subject specific pedagogy. This is modelled in PD sessions through activities for tutors. Any potentially new or challenging concepts are explored with tutors</p>	
<p>Subject Specific Training. Where subjects have been grouped together for the PD sessions, tutors are guided to activities in the subject course manuals to ensure the PD is not generic. Where appropriate there is direct page or point references to activities in each of the relevant subject course manuals.</p>	
<p>Integrating GESI: each PD session explicitly highlights at least two (2) teaching and learning activities from the course manual/s which should be used to promote student teachers' understanding of GESI responsiveness and support the inclusion of all pupils.</p>	
<p>Assessment. Integrating and embedding NTEAP practices PD sessions include at least two continuous assessment opportunities which will support tutors in developing student teacher's understanding of and ability to apply assessment for or as learning.</p>	
<p>Phase Specific Training. Tutors are guided to specific activities in the relevant phase course manuals for EG, UP and JHS. Tutors are advised to group student teachers according to the phase they are training for specific activities.</p>	
<p>Building in STS. STS tasks are integrated into the PD sessions. Preparing for work in school and opportunities for tutors to draw on what student teachers are learning in school by, for example, targeting observations linked directly to the themes in the course manuals.</p>	

<p>Building in activities which support the development of 21c skills in particular the use of ICT. The development of these is integrated into the PD sessions including the use of ICT to support learning. Each PD session should include at least two (2) examples of students being required to use ICT to extend their learning.</p>	
<p>Resources /TLM. Where specific resources are required, it is clear where tutors can access them e.g., videos, online resources, or readings.</p>	

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