Report on African University Pilot Sites

PBEA: Professional Learning Communities (PLC)

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Purpose: The purpose of the site visits was to learn first-hand how the PBEA E-modules are being implemented and what teaching approaches are used at each institution. The information will be shared with PBEA staff to assist them with new module development and existing module modifications, updates and guides. The information will also be used to inform the PLC team with incorporating a professional learning community among African plant breeding faculty. The aim of the PLC is to improve overall classroom instruction and curriculum development. The information will also guide the agenda for the 2017 and 2018 Teaching and Learning Symposium and other teaching and learning communication between PBEA-PLC and pilot site faculty.

Site Visit Details:

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<th>Institution</th>
<th>Dates</th>
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<td>University of Kwa-Zulu Natal, Pietermaritzburg, South Africa</td>
<td>February 20-25, 2017</td>
<td>Levings &amp; Clawson</td>
<td>Dr. Julia Sibiyi and Dr. Alfred Odindo</td>
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<td>Makerere University, near Gazoya, Uganda</td>
<td>February 27- March 2, 2017</td>
<td>Retallick &amp; Levings</td>
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<td>Kwame Nkrumah University of Science &amp; Technology, Kumasi, Ghana</td>
<td>March 6-9, 2017</td>
<td>Miller &amp; Levings</td>
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Agenda: Generally, Day 1 included faculty introductions, department tour, review of the week’s agenda, and classroom observations. Day 2 included observing classes, interviewing students and/or faculty. Day 3 included presenting a workshop for students on presentations and a workshop for faculty (either the faculty for the Plant Breeding Department or for a wider audience) and meeting and observing faculty teach. Day 4 and/or 5 included discussions on the week’s observations and information about resources available through the PBEA-PLC website with faculty and PhD students.

The site visits represent only a snapshot of the curriculum and instructional practices used by the African plant breeding academic programs. This report is based upon observations, interviews, and focus groups. What was viewed was a few days out of a 2 year MSc degree program.

University of Kwa-Zulu Natal

The UKZN Plant Breeding MSc is a 2 year program. The first year consists of courses and the second year students are matched up with companies and organizations where they get hands-on practical skills through internships and conduct their research. During the first year three main courses are taught: Plant Breeding Design and Mgmt (1st semester) and Advanced Plant Breeding (2nd semester) and Plant Breeding Internship & Seminars (year-round). The E-modules are incorporated in the last course, as well as other content topics and professional skills. These modules are taught in blocks (i.e. the Plant Genetics module we observed was taught over 2 weeks- 9-1 p.m. each day). Other courses were taught in the afternoon, as well as refresher English, specifically for Portuguese and Kiswahili speaking students. Some of the E-module topics are covered in the other two courses, although the instructors are not using the E-modules. Students are encouraged to use the e-modules for self-study. A PhD program is offered as well, and many of these students were in the E-module
class we observed. The University is requiring instructors set up their courses on Moodle and it is important that instructors can upload the E-modules on this platform.

Faculty and Assistants we observed and or discussed the UKZN program with: Dr. Julia Sibiya and Dr. Alfred Odindo; Dr Cousin Musvosvi (Post Doc), Dr Learnmore Mwadzingeni (Post Doc), Dr. Edmore Gasura (Post-Doc).

We observed the Crop Genetics course each day, two undergraduate courses taught by the program’s faculty members, and conducted interviews with three faculty members, 2 PhD students, 1 Post-doc and asked questions of several MSc students informally.

**General information about the E-modules:** Overall the impression from UKZN interviewees was that the E-modules were helpful, have good coverage and depth, the animations, colors and visuals are very good and they aid instructors and students. Instructors use the visuals, videos and animations in their own lectures. Graduate students refer back to the E-modules in order to better understand concepts, and to help them in writing their research proposals. Concerns about the modules include: spelling and grammar, and inconsistencies in some content with content presented in later modules. The background photo on each module is the same for each module. A suggestion was to change these to photos representing something specific in the modules so students have a visual cue about the topic of that module and can easily go back to it. Another concern was the need for ISU to provide an updated version of the flash drive with the E-modules because of the lack of internet receptivity in many classrooms and the ability to download the new version. The Applied Learning Activities (ALAs) were found helpful to increase interaction and learning between students. They could be improved by providing the instructors an answer key- not with just the calculations, but the reasoning or analysis behind the activity. Many shared that more ALAs need to be provided to reduce their workload in developing their own. Some students shared that ALA or exercises should be used more often by instructors. A suggestion was to have a weekly ALA assigned to students (perhaps on a weekend and have students report back on Monday).

**Learning and teaching preferences:** Students and faculty were asked to share what their instructors did that helped with student learning:- one student shared that they preferred it when instructors caught your attention in a way that wants you to know why; and others shared when there is more class participation, more practical’s, field visits and application exercises. A student shared that it is important for faculty to find out what students value and show them how the materials are a value to them. A practice a few students voiced as not helpful was “reading from a textbook or the modules.”

All faculty interviewed shared that they did not teach directly from the modules and several shared that they developed powerpoints (PPTs) that further condensed E-module text into bullets. We observed faculty pulling up visuals from the E-modules. “If I can find a way to copy the page with an animation or visual and put it in my PPT it would be helpful.” It was shared that a faculty member did attempt to “flip the classroom” and this method was believed to confuse the students. The reasons cited were the various academic backgrounds, English language fluency, and cultural differences between students. Faculty also shared that many students are unprepared (in writing and presenting; English; basic science; statistics) for their graduate-level experience.

**General Observations of Classroom instruction:** We observed 5 days of a 2 week Crop Genetics modules instructed by a post-doctoral student and two undergraduate courses taught by faculty. In the Crop Genetics course students used the E-module as their text book and the instructor developed a set of PPT slides to lecture from. He pulled up visuals and animations off of a flash drive to use and also used a white board to present concepts (genetics and statistics). He used questioning techniques and although many of the questions were mostly recall, he could assess their understanding and back-up and present the material over or differently to help students get back on track. Twice that week he used a 4-5 question quiz to motivate students to learn the material. After the quiz was submitted he went over the answers with the entire group.

Students were new to UKZN, as they had just started a week before. In that time the instructor established a good rapport with the students and a good rapport was well established between the students. He could call out students by
name, put them on the spot, but used humor when students didn’t respond and other students were quick to help with answers. The instructor appeared to establish a very trusting and open climate for learning.

We also observed an undergraduate biotechnology class and a pasture management class. One was taught more traditionally-using PPT slides and lecture and the other the instructor set up an experiential learning activity where three groups of students were given a problem to solve over the rest of the course semester. Groups were established and the instructor provided guidance but let the groups norm and storm to develop a plan for their projects.

**Conclusions/Recommendations:**

Instructors prefer that ISU provide updated versions of the E-modules on a flash drive so the materials can be accessed when internet is not available. Not all faculty are using the E-modules. In the future it would be good to interview these instructors. Those who are using the E-modules state they are happy with them and believe the modules are ready to share with other Universities. UKZN instructors are using the E-modules in various ways, but the approach they and students prefer is when the instructor lectures from bulleted PPTs, uses the whiteboard to explain and the E-modules are available for students to read before and after the lecture. Students shared they would like more hands-on approaches such as exercises, ALAs, practical’s and field trips as they need more practice with the skills and concepts of plant breeding. The PLC Team recommend instructors continue their overall teambuilding approach with students and incorporate more ALAs, practical’s, and exercises during class lecture time. This will help instructors identify student misconceptions/errors in thinking so they can make changes to future lessons and this will help students by giving them practice with the material.

UKZN has recently changed its promotion and tenure system to include a robust teaching and learning component. Instructors must complete a teaching and learning portfolio that includes presenting and conducting research on student learning. This cultural change will help improve overall instruction, but adds burden to an already taxed faculty. PBEA- PLC could assist UKZN Plant Breeding Faculty with providing a forum for them to present on teaching and learning and assist them in conducting educational research.

**Makerere University**

The MSc course in Plant Breeding at Makerere University is a 2-year program, organized as cohorts that are admitted every second year. The first year is dedicated to coursework, and includes some planning and initiation of the student’s research project. For their thesis research during the second year the students are connected to a national breeding program in Uganda or an International Agricultural Research Center, gaining hands-on practical skills and experience within a major breeding program. The first semester courses include: Plant Breeding/Genetics, Statistics, Basic Molecular Biology, Plant Breeding Practical Methods, and Foundations in English. Second-semester classes emphasize Quantitative Genetics applied to plant breeding, Seeds Science and Systems, Crop Agronomy & Physiology, Biopolicy, Biosafety & Bioethics, Project Management, Plant Protection (pathology, mycology, insect and weed control), English for Scientific Writing, and sometimes Agricultural Marketing.

Classes are interactive, with new material covered in morning lecture sessions, from 8 AM to 1 PM. Afternoons (2 PM-6 PM) are occupied with tutorial sessions, research methods/proposal development, and English lessons. Classes are held Monday-Thursday, with Friday usually devoted to practical breeding exercises in the field.

The E-modules are used as a resource for lectures, especially for Genetics and Statistics, and are available as a resource for students’ self-directed learning. Afternoon tutorials sometimes have involved ALA’s.
Faculty and Assistants we observed and or discussed the MAK program with: Dr. Richard Edema, Dr. Paul Gibson, Dr. Patrick Ongom, Boris Alladassi, and Bruno Awio.

We observed the Plant Breeding course each day, the Basic Molecular Biology course (one day) and conducted interviews with three faculty members, 2 Assistants, and informally asked questions of several MSc students.

**General information about the E-modules:** Overall MAK faculty and students find the E-module helpful. The E-modules are used as the primary textbook in many classes and students review the E-modules when they are designing their experiments. One instructor uses the E-modules to help with planning his lessons, and he shared that more modules are needed on the basics. Faculty shared that some E-modules are missing foundational elements and the lesson sequence is not always intuitive. The bookmarks within the module slides are needed to quickly access specific slides, visuals and videos. Quantitative Genetics is believed to be too advanced for MSc students. Even with these concerns we observed faculty assigning various parts of the E-modules as homework to prepare for the next day’s lecture, even when the lecture did not follow the E-modules. Teaching assistants shared they use the ALAs during their afternoon sessions to reinforce concepts presented in the lectures. Students worked together on the ALAs during the class period. Downloading the E-modules was a bit problematic in Uganda, as shared by faculty because of transcontinental streaming issues. The modules can only be downloaded early in the morning (5 a.m. Professors can put on a flash drive for students, but it is not easy.

Faculty questioned “who are the intended users of the modules.” and “how did the designers intend for the E-modules to be used?” Answers to these questions could assist in updating current modules, creating new modules and in achieving success in instruction. It was suggested that the focus be on plant breeders and not the development of breeding biologists. The students need technical knowledge and skills to run a PB program so they know how to and when to make good decisions. There was also a discussion on the Seed Science E-module that MAK faculty are working on, but there was no specific ideas on how they would be different than the current modules. A concern is trying to get the modules right and what needs to be done to improve the existing modules. A suggestion was to provide a supplemental teaching aid such as a written Professors Guide or a Toolkit and an introductory video that can guide faculty on how to effectively use the E-modules so they are set up success. This could include such things as: 1) PBEA materials 2) Background on learning and teaching 3) Sample copies of syllabi 4) Links to other learning (videos/visuals)5) Other resources 6) Details on how to effectively use the modules.7) how to sequence topics/courses

The faculty shared the critical need for the E-modules. The reason for this need includes: 1) making sure instructors have up-to-date information to share with students because when they graduate they will and are promoted to very important roles in their respective countries; 2) that soon many PB professors in Africa will be retiring and we need to provide new instructors/faculty with good material to make their jobs easier and effective; and 3) there is an need for existing African Plant Breeding professional development to help keep graduates and PB personnel up-to-date.

Faculty believe that the curriculum matrix and core competencies need revisiting at the Symposium. They suggested providing time to tweak them. A need for Information on Technical writing and Leadership was identified

**Learning and Teaching Preferences:** Faculty shared their perception that there is a preferred or expected way they are to teach or use the E-modules. They shared that there should not be a “one-size fits all approach.” Faculty and instructors shared that the approach that works best for them is to have the instructor go over the material and then have students look at the modules to review what they did not understand from the lecture. One professor shared that he prepares PPT slides and makes reference to the E-modules. We did ask about lesson plans and instructors did not state that they have created them. They did think it would be helpful, especially for others who will be teaching their courses in the future. It was difficult to speak with students during the MAK visit, as students were in class almost all day. Therefore we did not get information about the type of instruction the students preferred.

Dr. Retallick provided an interactive session for students and faculty on learning styles. The session included students completing a questionnaire to determine their learning style.
visual, auditory and tactile learners). The majority of MAK students were divided between visual and auditory learners with only 2 showing a preference for tactile learning. This session built awareness of the need for faculty to teach across learning styles and not to assume that way they learn or have been taught is the preferred way of others.

Dr. Levings provided an interactive session on developing effective presentations that modelled use of group work within a lecture/presentation format.

**General Observations of Classroom instruction:** We observed three and ½ days of instruction. During this time we observed the Plant Breeding general course from 9-12 or 1 p.m. We also observed a .5 hour session Biotechnology course session. Generally MAK instructors were lecturing using the chalk board and white board or they were using PPT slides with use of the white board to share examples or to elaborate upon ideas. We did observe professors sharing a few specific E-module slides with visuals to the class. Instructors lectured and then asked questions. The questions were mostly of the recall type, but both instructors also asked students to interpret and to predict. They waited for student response and either corrected faulty thinking by further explaining or clarifying the material. Students could not always come up with an answer. Students appeared attentive and were taking notes. The teaching assistants were at the back of the room with the E-module up on their computer, but we could not tell if they were following the lecturer or preparing for their afternoon session. The instructor broke up the lecture by having students do calisthenics and preparing a group fun activity (usually a song or dance). The classroom was set up in a traditional style.

**Conclusions/Recommendations: General Observations of Classroom instruction:**

Instructors are attentive to students and have done much to create a safe and trusting environment. Faculty recognize student’s deficiencies and work hard by providing remedial lessons to get students up to speed. They use good questioning techniques in concert with their lectures. The E-modules are used. In one class the primary use is as a text book and in the other class the professor uses it as a guide to create PPT slides and to sequence his course, as well as a text book. The ALA’s are used, but it was difficult to say how often and in certain classes or all of them. Based on what we saw and the questions we asked we would recommend to local faculty to explore using more learner-centered techniques to give students practice with the material during the 8-1 p.m. lecture. Going through the material in class does not guarantee that students can perform calculations or learn concepts adequately. The faculty use good questioning techniques (a range of lower to higher order questions on Bloom’s Taxonomy) and use of wait time, but rely on responses from volunteers which does not help assess all student’s understanding of the material. We do recommend instructors use a wider variety of instructional techniques and we recommend faculty have a more robust set of assessment tools to measure student understanding.

Flash drives of the updated E-modules for instructors to copy for their students would be helpful.

**Kwame Nkrumah University of Science & Technology**

The Plant Breeding MSc is a 2 year program. The first year is courses (2 semesters) and the Maize breeding pipeline practical during the major growing season. Year 2 is fully devoted to research projects on selected topics, leading to the preparation of student theses, under the joint supervision of faculty members and research scientists from the Crops Research Institute and the Savannah Agricultural Research Institute. The last 6 months of the 30-month program is devoted to Internships. The 1st cohort underwent three-month internships at the Crops Research Institute in Kumasi (October to December) and then were posted to selected seed companies in their respective home countries for 2 months (January and December) to complete for their degree. (This year they were not able to do 4 months at the Crops Research Institute as intended, because they were late for thesis defenses in September). Courses include: Phys. Of Crop Genetics; Adv. Plant Breeding; Population & Quantitative Genetics; Host Pest Interactions; and Plant Water & Soil Relationships; Seminar, Advanced Plant Breeding; Quantitative Methods; Crop Genetics; Crop Improvement; Molecular Plant Breeding and Communication.
Faculty assigned students the E-modules as a primary text for several of the courses we observed (Crop Genetics, Quant. Methods, Quantitative Genetics & Molecular Plant Breeding). At least one faculty member chose not to use the E-module as the primary text. One faculty member lectured directly from the E-module. Others used the E-modules to prepare their lectures. Students were encouraged to use the E-modules for self-study.

We observed two classes each morning from 9-1 p.m in the Agra Building. After the morning sessions, students left for lunch and later returned for afternoon classes. We did not observe the afternoon classes. English classes were held for French speaking students in some or most afternoons.

Faculty and Assistants we observed and or discussed the KNUST program with: Prof. Richard Akromah, Dr. Ben Banful, Dr. Stephen Amoah, and Dr. O.S. Olympio. We formally interviewed faculty members as a group and conducted a focus group with students. We informally interviewed individual faculty and asked questions of several MSc students.

**General information about the E-modules:** The impression gleaned from KNUST interviewees was that the E-modules are helpful and are an aid to instructors and students. Instructors use the modules to build their lectures- as one professor shared “I go through the module myself and use my own professional knowledge to create my lectures. The students go back to the E-modules (after the lecture) and get what they need.” Faculty shared that the some of the material isn’t available in traditional texts. The new E-modules appear to be very helpful- not only to student study but for professor professional development as well. A concern expressed was a need for the E-module reference material (located at the end of the modules) to be provided. Another concern was the need for ISU to provide an updated version of the flash drive with the E-modules because of the difficulty in downloading the E-modules. The ALA’s were found helpful to increase interaction and learning between students. Faculty shared ALA’s could be improved by providing the instructors an answer key- not with just the calculations, but the reasoning or analysis behind the activity. It was shared that sometimes the ALAs explain small points too much and go in circles. A suggestion would be to update and edit existing ALAs. Many shared that more ALAs need to be provided to reduce their workload in developing their own.

Faculty were asked if they use Facebook or Twitter. Faculty shared that they don’t usually use these social media platform, as they usually use “What’s Up.” This social media platform allows each user can create their own social group and each receives messages from their own group.

**Learning and Teaching Preferences:** As described earlier, faculty at KNUST use a variety of approaches in using the E-modules. We observed one faculty member using the module text while they lectured, one had students read ahead, lectured, then do the ALAs, another used the modules as the text book and another didn’t use them. Faculty could look at the PBEA site on their Smart phones. Several faculty could not remember their passwords. One or two had requested a new password. They found the SMART phone version a bit difficult to navigate.

Students voiced their desire to embed more practicals (interactive elements such as labs, exercises, ALAs) in the first year courses. Students indicated that they liked and wanted more hands-on opportunities, laboratories, interactions with other researchers, and more assignments “to find out for themselves-to make mistakes and see what they did wrong.” Students also valued concrete examples and consistent instructor preparation. Faculty were asked if they visited the PBEA-PLC site and if they looked at the newsletter. Some had and some had not. We could not bring up the PBEA site in the classroom because of internet issues.

Dr. Miller conducted an interactive workshop for faculty within the department on how to build better multiple-choice questions. The session engaged faculty on writing effective questions to assess student learning.

Dr. Levings provided an interactive session on developing effective presentations that modelled use of group work within a lecture/presentation format.
General Observations of Classroom instruction: We observed three and ½ days of instruction. Generally KNUST instructors were lecturing using the chalk board or white board or they were using PowerPoint slides with use of the white board to share examples or to elaborate upon ideas. Instructors lectured and then asked questions. The classroom was set up in a traditional style. The questions were mostly of the recall type, but instructors also asked students to interpret. They waited for student response and either corrected faulty thinking by further explaining or clarifying the material. Students could not always come up with an answer. We observed class presentations for one of the courses. Students were divided into three groups and each group presented on a different concept in the Crop Genetics course. It was clear students used the E-Modules to help them in developing their slides. The instructor questioned students on content knowledge as they presented and voiced high expectations for students by asking one group to present again later that week using the presentation skills he shared. The faculty member in the Molecular course also assigned group presentations. In all courses we observed that some students were more vocal than others, some students took notes during lectures and some did not, and some students had their computers open to the E-modules as faculty lectured and others did not.

Conclusions/Recommendations: During this time we observed several instructors teaching various subjects. We observed occasional internet reliability issues and the loss of electrical power. Updated versions of the E-modules should be available on a flash drive to facilitate use offline. UKZN faculty used a wider variety of teaching methods than what Judy observed at the other Universities. Like the others they relied on a traditional lecture and used questions to check student understanding. Our observation suggests that instructors could benefit from additional questioning strategies to engage learners and assess learning. We observed some faculty breaking students into groups and asking them to prepare a section of the lecture as an assignment. What we did not observe was the use of worksheets or ALAs, asking students to solve problems, or the use of case studies, scenarios or exercises. Instructors need a variety of approaches to encourage students to apply the material. Because several faculty had not visited the PBEA site for a while and few or none had looked at the PLC portion of the site we recommend providing time during the Symposium to get all faculty connected with the resources on the site. We also recommend that the PBEA staff follow-up to see if “What’s UP” should be added as a social media option for African faculty. We did not know to ask if UKZN or MAK faculty use this platform or not. We also recommend that all resources found at the end of each of the PBEA E-modules be provided to faculty (funding may be needed to purchase these copyright research papers).

Overall Conclusions/Recommendations

Learning & Teaching

Overall instructors believe their primary role is to serve students and at each University we observed a culture of creating safe and trusting environments with the students. The classroom climate although good can always be better. Some students voiced concerns with instructors who are not adequately prepared, and when instructors share their religious values. Almost all students identified a need for instructors to offer more in-class work/exercises that help them practice the skills and use of concepts taught during class time in the first year. Instructors point out that practicums come during the second year. It is our recommendation that instructors build more time for exercises/hands-on activities during the lecture/classroom period the first year to ensure students are understanding concepts before building on new concepts. Instructors need knowledge and practice creating their own lesson plans that they can use in the future and tweak. By creating lesson plans instructors are more likely to incorporate more learner-centered techniques. Breaking up long lectures by doing this may create more work in the short term for instructors, as it will initiate more planning (creating lesson plans) and may include changing their grading scheme. But the pay off in better student learning is worth the time investment.

Instructional Methods
• Provide faculty with face-to-face professional development at the Symposium and at IMCDA meetings and other venues on the following:
  o How to enhance lectures using learner-centered teaching techniques. Rationale: All faculty/instructors are relying on lecturing as their preferred teaching method. This is a long standing traditional and will be difficult to change. Hence we believe to change the culture we need to start with small steps. These small steps include adding learner-centered approaches to how they lecture. Information on how to do this is included on the PLC site, but faculty are not visiting it and don’t have practice using these new techniques.
  o How to create lesson plans and have them share them on the PLC discussion forums with their colleagues. Rationale: It appeared that faculty were not acquainted with or prepared formal lesson plans. Creating lesson plans and sharing with their colleagues can help to create a space for inclusion of learner-centered practices. By sharing these with their colleagues a more robust set of materials will be available at little cost and holds promise to improve overall instruction.
  o How to effectively assess student understanding and assessing their own teaching. Rationale: As faculty change their teaching practices to learner-centered approaches there will be a need to learn how to assess students using this approach (i.e. use of rubrics and portfolios). Faculty also voiced concerns on how to effectively ask good multiple choice questions to assess for higher order understanding. For faculty to improve their instruction they need guidance on how to critique their own performance.
  o How to improve their questioning techniques and how to assess learning from this technique. Rationale: Faculty are using questioning as a technique and some are more fluent with asking good questions than others.
  o How to incorporate professional skills listed in the PBEA Core Competencies. Rationale: Many of these skills can be strengthened by having faculty plan assignments and lesson plans that incorporate these skills (i.e. writing, communications, leadership, team-building, etc.)
• Encourage the use of various learner-centered techniques by including information about them in PBEA Professor Guides and in the development of new E-modules and ALAs. Rationale: Professional development can occur not only through workshops, but through documents (guides, lesson plans, exercises). If we want faculty to improve their instruction good instructional practices need to be reinforced in numerous ways.
• Provide faculty opportunities to present professional development on learner-centered teaching and learning. Rationale: In the case of UKZN this will meet a need for faculty promotion and tenure documentation and will increase future use of new techniques if they are teaching them to others.
• Continue providing the PBEA Teaching Professor Newsletter. Rationale: Faculty are opening up the Newsletter and several shared they are reading it.

E-Modules

Universities are constrained by their overall curriculum structure to fit in the E-modules. Future versions and updates of the E-modules need to reflect the varied curriculum structures between Universities, the access to internet, and be flexible enough to accommodate instructor teaching styles. There seems to be some concern that the modules need to be perfect before introduced to other colleagues, yet many others recognize that what is perfect for one instructor is not perfect for another. The modules need to be flexible but the content must be easy to understand and yet cutting edge. This means that the curriculum must continue to be updated and the presentation of the E-modules should be flexible enough that faculty can choose from use a variety of instructional methods to teach the E-module content.

ALAs
• Provide more ALAs and update existing ones so they all have a similar format. Some want more of them, some say there are enough and they can create their own
• Provide answer keys to all ALAs and add analysis not just calculations. Rationale: Requested by several faculty.

Technology

• Need to provide faculty with any updates of PBEA on a memory stick. Rationale: Internet is unreliable in classrooms and other locations were the materials are need. There are difficulties when downloading materials.
• Look into adding What’s Up as a social media platform. Rationale: In the case of Ghana this is the preferred social media platform used over Facebook and Twitter.
• Provide time for all faculty to access the PBEA and PBEA-PLC site at the Symposium. Rationale: All faculty do not remember how to access the PBEA and PLC materials, or have not done so.
• Provide time for all faculty to upload their lesson plans, ALAs, questions on the PLC discussion forums on the PBEA site. Rationale: For faculty to become a Professional Learning Community they need to know how to upload and have experience and the confidence to share their materials and ideas.
• Assist faculty by having page numbers on the E-modules that faculty can directly access. Also help them with the ability to copy animals and visuals directly on the E-modules to insert in the PPT presentations. Rationale: Direct request from faculty.
• Change the background photo on each module so they are not the the same for each module. Rationale: Visual cues help students locate information easier.
• Create bookmarks within the modules for easy access to content and visuals. Rationale: To reduce time spent by faculty and students flipping through the entire module to get to the slide they need.
• Create a new professor video that will inform professors about the purpose of the project and what they need to know to deliver high quality instruction to students using the E-modules. This should include where materials are, overview of the PBEA and PLC website, various ways the E-modules can be used to create learner-centered environments, and how instructors can contribute to the future development. Rationale: As the project is picked up by new Universities instructors need knowledge of how the materials are intended to be used.

Create a Professors Guide to Each E-Module/Toolbox for faculty and instructors that includes the following:

• Learning Objectives & Core Competencies
• Rationale on the PBEA E-module sequence and pre-requisites
• Preparation- materials to order, length of module/lessons
• Background on learning and teaching
  o Learner-centered teaching
  o Use of ALAs, Field Trips, Labs, Practicals, case studies
• Sample copies of syllabi, lesson plans, PPTs, Assessments
• Additional Materials/References Links to other learning
• How to modify materials- different approaches.
• Support – Contacts & emails

Other:

• Provide open access research articles (at least those provided as resources at the end of each E-module and a few easy articles to use in their teaching). Rationale: African libraries do not appear to be purchasing
subscriptions to journals in the field of plant breeding. There is a need help students learn how to read research literature and start to critique experiments.

- Provide access to text books – Rationale: Presently at least 2 of the 3 Universities were they purchasing textbooks and are copying for themselves (their library) or copying for each student. They would like someone to compile existing good open access resources that are not copyright protected.