

**An exploration of the perceptions and attitudes of Senegalese professors
toward learner-centered instructional strategies in agriculture courses**

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PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

An exploration of the perceptions and attitudes of Senegalese professors toward learner-centered instructional strategies in agriculture courses

Wangui C. Gichane

ABSTRACT

Like many African nations, Senegalese education emphasizes teaching approaches characterized by lecture-driven courses and information memorization. In 2011, USAID launched the Education and Research in Agriculture (ERA) project to strengthen the Senegalese agriculture education sector by working closely with higher-education institutions to provide resources in pedagogical practices. The objective of the study was to assess the needs for employing learner-centered practices and challenges professors' faced in terms of current teaching and learning methods at five Senegalese higher-education institutions. An explanatory mixed method study was designed to assess professors' teaching strategies, attitudes toward learner-centered methods, social climate at the institutions, perceived confidence in effectively incorporating these methods, as well as the challenges faced in current teaching and learning approaches. Results showed professors had positive attitudes towards learner-centered methods and thought they were effective teaching techniques. Professors also indicated that they felt little to no pressure from their peers or institutions in employing other methods and some felt confident enough to use learner-centered strategies properly. Data also revealed that the culture of instruction and the constraints in teaching were the primary obstacles preventing professors from effectively incorporating the methods in their classrooms. The study's findings indicated that: 1) addressing the normative beliefs and social norms toward learner-centered methods requires an understanding of the cultural context of Senegalese instruction and 2) professional trainings can make a marked difference in how professors think about teaching practice, as well

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as increase self-efficacy that can influence their behavior toward more learner-centered strategies.

DEDICATION

To my parents, John G. Ndiritu and Wambui Kirubi: thank you for being my biggest cheerleaders in every milestone in my life. I love you both so much and I honestly do not know what I would have done without your support, encouragement, and love.

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CHAPTER ONE: INTRODUCTION

Recent developments in Senegal showed major challenges in higher education institutions due to insufficient teaching and learning methods (Guilbaud, Abaye, Gueye, & Li, 2012). A series of assessments conducted by the United States Agency of International Development (USAID) in 2011 showed that one of the primary constraints in agriculture was that graduates were entering the agriculture sector without developing necessary critical thinking, practical, and professional skills (USAID, 2011). This was a direct result of the ‘teacher-centered’ methods of instruction prevalent in Senegalese classrooms.

Like many African nations, teacher-centered methods characterized by authoritative teacher figures, lecture-driven courses, and memorizing and recalling information have dominated classroom instruction in Senegal (Brown, 2003; Grunert, 1997). The past decade has seen a push away from teacher-based instructional practices to methods that focus on the individual learners so they can become cognitively, behaviorally, and emotionally engaged to become active learners in their courses (Schussler, 2009; Varvus, Thomas, & Bartlett., 2011).

In 2011, USAID launched the Education and Research in Agriculture (ERA) project to strengthen the education, research, and training in Senegal. The project's primary goal was to assist in creating a more skilled workforce in the agriculture sector by addressing key issues that improve the access of agricultural knowledge (USAID, 2011). Partnering with Virginia Tech and four other higher education institutions, ERA moved forward with its goal to create a more skilled workforce in the agriculture sector with by establishing better agricultural markets that meet the populations demands, increasing human resource capacity, improving the access to agriculture knowledge, and advocating for agriculture sustainability through sound practices (USAID, 2011). The project did so by working directly with higher education institutions,

agriculture training centers, research centers, and extension services (Bravo-Ureta, Maas, Diouf & Ndoye., 2012).

ERA identified the gaps in teaching and learning strategies as a major constraint limiting students' some of which can be associated with teacher-centered approaches abilities (Abaye, Guilbaud, Mbaye, Bocoum, & Guisse, 2013). According to Varvus et al.,(2011) shifting to more learner-centered methods can improve the quality of education for students to ensure a well-skilled, trained, and ready workforce and to do so, instructors must use pedagogical techniques that cater to students needs and foster active learning.

Therefore, this research study examined the developmental needs of professors at Université de Cheikh Diop of Dakar (UCAD); Université Assane Seck de Ziguinchor (UASZ); and Université de Gaston Berger (UGB); Ecole National Supérieure de l'Agriculture (ENSA) and Institut Supérieure de la Formation Agricole et Rural (ISFAR) to identify the needs and challenges they face in their current teaching and learning strategies to shift from teacher-centered to learner-centered methods.

Statement of the problem

Senegal has a high demand for skilled and educated employees and professors need to be equipped with adequate teaching/learning strategies that guarantee a trained workforce (Bravo-Ureta et al., 2012). However, professors were not keen on the learner-centered approach because it directly conflicted with the traditional teacher-centered approach prevalent in most African classrooms (Abaye et al., 2013; Vavrus et al., 2011). And so the problem that remains—what are the challenges professors currently face that prevent them from adapting learner-centered strategies? And how might understanding their attitudes, environments, instructional beliefs, instructional culture, and perceptions be helpful in combating these challenges?

Need for the Study

This research study was based on findings taken from assessments conducted by USAID that revealed constraints in the pedagogical techniques at higher education institutions in Senegal were due to weak curriculum, courses, programs, and resources in the educational system (USAID, 2013). With the ERA project underway, staff and personnel began implementing short term technical training programs to help strengthen and improve instructors skills in teaching and incorporating more learner-centered methods in their classrooms (Tech, 2013). These trainings focused on providing professors with materials, resources, and the knowledge for incorporating more learner-centered approaches by first introducing course syllabi into the curriculum. However, professors did not readily accept these methods because the learner-centered approach conflicted with the more traditional teaching practices in place (Abaye et al., 2013). Their reluctance to accept these new approaches raised some questions on whether there were other challenges and constraints in their pedagogical techniques preventing professors from shifting from teacher-centered to learner-centered methods. And if there were, what were they?

Senegal has a high demand for skilled and educated employees and professors need to be equipped with adequate teaching/learning strategies that guarantee a trained workforce (Bravo-Ureta et al., 2012). To do so, we must identify the challenges professors face at each institution and identify if they are properly incorporating and facilitating learner-centered approach in their classrooms.

Purpose and Objectives

The purpose of this study was to identify the needs for employing learner-centered practices and the challenges professors' face in terms of current teaching and learning methods at five targeted agriculture institutions in Senegal. The specific research objectives were:

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1. Identify the current challenges and constraints professors' face in instructional practices that may hinder/encourage the adoption of new teaching and learning strategies.
2. Understand how institutional environment and social climate affect professors' adaption of learner-centered practices.
3. Understand professors' attitudes and perceptions of using learner-centered approaches in their classrooms.
4. Identify whether professors are incorporating learner-centered methods in their classrooms and examples of ways they are doing so.

Conceptual Framework

The theoretical framework guiding this study was Icek Ajzen (1991) Theory of Planned Behavior. Ajzen's (1991) theory measures an individual's intentions of engaging or performing in certain behavior by looking at three components: attitudes, subjective norms, and the perceived behavioral controls. The first component looks at an individual's positive or negative outlook of engaging in or performing in a certain behavior and is often preceded by the beliefs about the benefits or consequences of a particular behavior (Patterson, 2009; Ajzen, 1991). The subjective norms refer to the social pressures that an individual feels from his/her surrounding environment in engaging in a specific behavior (Patterson, 2009; Ajzen, 1991). Lastly, the perceived behavioral control refers to an individual's perceived confidence in his/her ability to perform the behavior (Patterson, 2009).

One of the purposes of this study was to understand professors' needs for employing learner-centered practices in the classroom. To do so, three components of the framework were used. The first was identifying professors' attitudes and perceptions toward learner-centered approaches. The second component was understating their perceived confidence in successfully

implementing learner-centered approaches in the classrooms and the last component was exploring institutional climates to see how instructional culture played a role in encouraging or discouraging them from adapting these strategies.

According to Ajzen's (1991) theory, a person is likely to perform in a behavior if he or she has a positive outlook on the particular behavior (attitude), has positive reinforcement from the surrounding environment to engage in said behavior (subjective norms), and believes that he or she is capable of effectively performing that behavior (perceived behavioral control). And so, the framework served as a guide in constructing the survey and interview questions that to help understand professors' attitudes, subjective norms, and perceived behavioral control to determine why professors engaged in teacher-centered rather than learner-centered practices.

Definition of Terms

Teacher-centered approach refers to a teaching method that focuses mainly on the transmission of knowledge from the teacher to the student and is often lecture driven with little teacher-student interaction (Grunert, 1997).

Teacher-centered environments refer to classroom environments where the instructors are the authoritative figure in classrooms using their knowledge to facilitate learning and student learning is restricted to the information provided by the teacher (Brown, 2003).

Learner-centered approach is a teaching method that places the student and learning at the center of the teaching experience by accounting for a learner's needs, interests, and abilities (Vavrus et al., 2011; Brown, 2003).

Learner-centered environments refer to classrooms where students are actively engaged with the classroom material, instructors and peers through daily dialogue, communication, and interaction (Brown, 2003).

Assumptions

Prior to this study, USAID/ERA personnel conducted some short-term training workshops designed to teach faculty at ENSA and ISFAR to create learner-centered syllabi and introduce them to some learner-centered approaches. One of the major assumptions was that those instructors present during the workshops had some understanding of learner-centered approaches.

Limitations

1. Time was the biggest limitation for both phases of the data collection process. Data collection was limited to the early summer months to ensure that the professors were present at their respective institutions. The limited time to engage with instructors made it difficult to build rapport with both survey and interview participants.
2. Professors participating in both data collection phases were aware that the study and research team were affiliated with the USAID-ERA project that is heavily involved in providing resources and materials to the institutions. Therefore, a limitation that can be made is that some interview and questionnaire responses were biased toward the program as a way to ensure continued ERA-institution involvement. To negate some of the limitations, professors were assured that their responses were confidential and that any acquired information was for research purposes alone. Participants were also informed that individual responses were only available to the research team only.
3. Lastly, social desirability bias was another potential limitation to the study. This is when participants respond to questions in a way they believe to be socially acceptable, particularly questions pertaining to the ERA program's involvement at the institutions (Ary, 2014).

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CHAPTER TWO: REVIEW OF THE LITERATURE ON SENEGALESE EDUCATION AND THE LEARNER-CENTERED APPROACH

Introduction

In this second chapter will go over the related literature on the instructional practices of higher education institutions in African countries, with a focus on Senegalese instruction. Senegal is the western most country in Africa located with a population of about 14 million people (Agency, 2014). The small francophone country has remained relatively stable since gaining independence from France in 1960 (Agency, 2014). Today, agriculture continues to play a leading role in the Senegalese economy with nearly 70% of its population working in the agriculture sector and 85% using agriculture as a source of income (USAID, 2011).

Yet despite the increase in foreign aid and investments in Senegal's economy, the nation remains plagued with low economic and developmental growth (Agency, 2014; Feed the Future Initiative, 2010). Senegal still falls behind in providing food security, poverty reduction, and economic stability to its citizens (Bravo-Ureta, Maas, Diouf, & Ndoye, 2012). Bravo-Ureta et al., (2012) state that nearly half of Senegal's population, particularly those in the rural environments, continue to live below the poverty line surviving on less than \$1 a day. Paired with low performing macroeconomic sector and challenges in agricultural production, Senegal depends heavily on food-imports and foreign investments (Bravo-Ureta et al., 2012).

Agriculture education, research, and training sector in Africa has increased in the past two decades with over 200 universities and with almost half offering agriculture and natural resources degrees and diplomas (Chakeredza, Temu, Saka, Munthali, Muir-Leresche, Akinnifesi & Sileshi, 2008). In Senegal, students from these institutions are provided with basic and professional training to meet the needs in a variety of fields. However, agriculture education

remains limited in funds, materials, and access to knowledge. Reforms have been in the past two decades to improve the quality and the structure of higher education policies to make students more competitive according to domestic and international standards (Ndiaye, 2003). Bravo-Ureta et al., (2012) claim that despite the increase in overall investments in agriculture, higher and post-secondary agriculture education still falls behind in productivity. This is a result of weak governance and an agriculture sector that is unable to incorporate the “interdisciplinary approaches necessary to produce the professionals that are needed” (Bravo-Ureta et al., 2012).

Therefore, Senegalese agricultural systems require heavy investments in agriculture research and training, as well as reforms in educational practice to prepare graduates for the sector. This chapter gives a brief introduction on the USAID- Education and Research in Agriculture (ERA) project and its mission to help instructors design more learner-centered curricula, followed by an overview of the instructional culture in Senegalese education systems. It will draw on some main ideas to understand the origin and prevalence of the teacher-centered approach and outline a rationale for switching to more learner-centered instructional approaches by looking at the perceived benefits for student learning and instructional practice.

USAID-Education and Research in Agriculture (ERA) in Senegal

In 2011, the United States Agency of International Development (USAID) launched the Education and Research in Agriculture (ERA) project to strengthen the education, research, and training in Senegal (USAID, 2011). Virginia Tech (VT) was awarded the five-year project to move forward with the goal of providing a more skilled workforce in the agricultural sector. It did so by addressing challenges such as meeting market and population demands, increasing human resource capacity, improving the quality and access of agriculture knowledge, and promoting best-practices in agriculture (USAID, 2011).

USAID-ERA did so by focusing on two components. The first included strengthening the applied research and outreach sector to improve food security and economic development in rural areas. This would be done by disseminating the knowledge acquired through research and education to local farmers and producers. The second component was to strengthen the agriculture education and training sectors by revamping curricula, updating knowledge, facilitating access to knowledge, building institutional capacity, and exposing students to information and technology that better prepares them for the agriculture sector (Abaye, Guilbaud, Mbaye, Bocoum, & Guisse, 2013; Bravo-Ureta et al., 2012; USAID, 2011, 2013). To do this, the project worked directly with the Senegalese higher education and research institutions to; 1) redesign content that allows students the opportunity for achieving higher order cognitive skill; and 2) update teaching and learning methods to include more learner-centered and practical approaches (Bravo-Ureta et al., 2013; USAID, 2011)

Initial assessments conducted by USAID-ERA revealed that some constraints in Senegal's agricultural sector were a result of weak content-delivery approaches prevalent in agriculture curriculum (USAID, 2013). Agriculture education was falling behind in providing quality education to its students resulting in graduates entering the workforce without any of the necessary skills needed in the sector (Bravo-Ureta et al., 2012). Bravo-Ureta et al., (2012) continue to state that one of the challenges preventing Senegal from increasing its agricultural sector is the weak educational infrastructure as a result of limited funding, small research and outreach sector, and a lack of educational support and resources for students and educators.

In the past five years, ERA has provided resources and support in a variety of workshops and trainings to facilitate curriculum redesign and strengthen the education sector. The most notable curricula enhancement activities were the syllabi construction workshops and course evaluation

trainings for professors to help introduce to more learner-centered approaches into the classroom (USAID, 2011; USAID, 2013).

Teacher-centered vs. Learner-centered approaches

Learning is an active process that requires daily and continuous student-teacher interaction (Grunert, 1997) It allows students to gain new information, practice and develop new skills, alter and shape previous knowledge with new knowledge, while being consciously aware that learning is occurring (Grunert, 1997). This type of learning is what is known as learner-centered.

Traditional teacher-centered methods give instructors complete control over the learning process, leaving students without any responsibility or control over their learning (Weimer 2002). Teachers plan out course objectives, design course content & assignments, and create evaluation methods that assess what and how students learn. Instructors under this approach decide who engages and communicates and maintain strict policies in a highly-structured classroom environment. They maintain control over most, if not all aspects in student learning process (Weimer, 2002; Grunert, 1997). Students are also unable to provide feedback to instructors on their classroom strategies and course content leaving limited opportunities for future improvements. It fails to acknowledge a student's role in the planning, execution, and feedback portion of the classroom experience and results in passive, disengaged students.

Contrary to the teacher-centered approach, the learner-centered approach focuses not just on the students' needs, but makes sure that the curriculum and its content prepares the learner for the field they enter (Grunert, 1997). Brown (2003) articulates that the learner-centered approach is geared to guide students to discover skills and mechanisms needed for critical thinking and problem-solving while simultaneously promoting continuous engagement with the student. An

instructor under this approach serves to encourage learning based on the needs, skills, and interests of his or her students (Brown, 2003).

In these classrooms, students actively engage with the course content, instructors and their peers through dialogue, communication, and interaction. Learner-centered techniques typically include: hands-on learning, integrating outside knowledge and experiences into current classroom materials, diverse set of teaching techniques that caters to students' unique learning styles, increased student involvement in out-of-class as well as in-class activities, cooperative learning methods, integrating the needs of the market and sector into classroom, reflexive inquiry, a greater use of information and technology systems, and a variety of evaluation and feedback mechanisms (Altinyelken, 2010; Brown, 2003; Weimer, 2002).

A common misconception is the notion that all teaching is 'learner-centered' because all class content is inherently designed with the student in mind. Weimer (2002) dispels this idea by distinguishing between practices that are considered 'learner-centered' versus those that are 'student-centered.' Just like learner-centered, student-centered practices are pedagogical techniques that focus on creating content that addresses students' needs (Weimer, 2002). However, learner-centered practices go further by adding the learning component ignored in the former practice: the way students learn, the tools needed for students to learn, the most effective tools to measure learning, and ensure learning is a continuous process (Weimer, 2002). The learner-centered approach allows instructors to construct an environment and curriculum that focuses on the how, what, when, and in what ways students will learn (Weimer, 2002). It also looks at the culture of learning—the contexts and backgrounds of the most effective ways students in that environment learn in order to create environments that fit students' specific needs (Brown, 2003).

The difficulty in transforming from teacher-centered to learner-centered methods is that the process needed to change instructional practices requires more than just a change in curriculum. There needs to be an entire change to the instructional and educational culture (Brown, 2003)—changes that includes the instructors' attitudes toward instructional methods, their perceptions of the environment, confidence in the ability to change current methods, and eventually behaviors in teaching. The push from teacher-centered to learner-centered does more than help students learn. Classrooms that engage in more learner-centered strategies often have students that are self-motivated, empowered, and confident in themselves and the material (Weimer, 2002).

Changing to more learner-centered methods gives students some power and control of the learning process. Students have the opportunity to have agency over their learning and take shift responsibility for learning from instructors to themselves (Weimer, 2002). Weimer (2002) continues to point out that shifting power-balance and allowing students agency over their own learning process can be enough to actively engage them in the content as well as provide them decision-making and problem-solving skills they otherwise would not have. Classrooms under these teacher-centered methods are driven solely by extrinsic motivators that include good grades, points, and marks for good classroom performance (Weimer, 2002). Learning is reduced to rule-based, structured approaches that limit students' choice in task performance, development opportunities, and self-regulated learning and creates passive, unmotivated students (Weimer, 2002; Wolters & Pintrich, 1998).

Weimer (2002) recognizes that an instructor to some degree must maintain control in the classroom to create guidelines that must be followed. However, students need to be given some authority over their own learning so they can develop the ability to think independently, critically, and creatively (Weimer, 2002). Hanrahan (1998) study showed that students'

behaviors and their learning behaviors are affected by the teacher-centered instruction. By positively reinforcing self-learning techniques fostered by learner-centered methods, students are able to have positive effects on their overall learning experience and become fully engaged in the learning process (Hanrahan, 1998). Incorporating more learner-centered techniques at agriculture institutions in Senegal is likely to increase active learning and prepare students to enter the agriculture sector.

Instructional Culture

Teacher-centered strategies are deeply embedded in the instructional practices of many Sub-Saharan African nations, including Senegal. Ball (1983) states that part of the reason that much of Africa is behind in education is partly due to the colonial influences imbedded in current teaching practices. Many of the educational policies and structures in Africa stem from Westernized ideals brought on by former colonial powers (Ball, 1983). Formal schools in Senegal were first established in the early 1890's as a mechanism of spreading Christian ideals to the African natives (Locraft, 2005). Education focused primarily on 'assimilating' and 'civilizing' and served to enforce control and power over students, rather than to educate. This is mainly because schools took on an educational policy of reshaping the traditional African ideology by convincing its students that French ideas, policies, and presence was a necessary good ((Badiane, 2008; Locraft, 2005). Instructors paid little attention to developing problem-solving and critical thinking skills, focusing instead on providing new knowledge and information to students (Vavrus, Thomas, & Bartlett, 2011).

The 1950's ushered an era of independence as many African nations gained sovereignty from their colonizers (Vavrus et al., 2011). Faced with the task of establishing independent nation and governments, new officials found themselves making the decisions in educations; to

either take up or adapt previous curricula and educational legacies long established by Europeans, or to abandon these ways entirely and design new curricula. Unfortunately, much of the new curricula and educational systems in Africa lacked the academic rigor required for students to foster learning and focused on the traditional teaching style approach similar to colonial practice (Bryant & Kelly, 2009; Vavrus et al., 2011).

Traditional teaching styles, better known as teacher-centered methods, were those that required instructors to become vessels of knowledge. Instructors in these environments acquired all the knowledge and designed curricula. Students had little input on how and what they learned, and had few opportunities to engage with the instructor or their peers (Brown, 2003; Bryant & Kelly, 2009).

After gaining independence in 1961, Senegal like most other newfound African states chose to continue following the French higher education system. However in 1971, policy makers made drastic changes in educational policies by creating curricula that addressed the Senegalese identity instead of a more European one. It was an opportunity for Senegal to create quality educational program for students that met the country's needs (Ritter, 2011). Yet student performance was still low on all educational levels.

Spurred by national protests for change, officials met again in 1981 for the *Education and Training Summit* to redesign the previous curriculum and improve education quality at all levels. This new reforms were designed to ensure students “maintain an interactive relationship with their physical, social, cultural, economic, and linguistic environment” which would then instill a spirit of research, analysis, and innovation that transforms the Senegalese society (Gueye, Kane, Babacar, & Sy, 2011) Reforms in educational policy have continued in the past decades, yet “undesirable teaching and learning practices” continue to persist in many classrooms; practices

that create strict and rigid learning environments offering little room for higher order cognitive development and long-term learning for students (Dembélé & Miaro-II, 2003). And so, the question remains: if these methods are so deeply imbedded in the instructional culture of Senegal, how can we introduce the discourse of the learner-centered approach? What are some ways to introduce the learner-centered discourse and facilitate a shift to more learner-centered teaching practices?

Education in Africa has seen vast investment in changing pedagogical practices (Altinyelken, 2010). Since the early 1990's, numerous efforts have been underway to shift from the more tradition 'teacher-centered' to 'learner-centered' approach that ensures all students have access to quality education (Altinyelken, 2010). Yet despite the changes to the formal education curriculum in the past three decades, education in Africa is still deeply rooted in the traditional teacher-centered approach (Kanu, 1996; Vavrus et al., 2011).

Improving the quality of education in the 1990's was at the forefront of every political and national agenda of most Sub-Saharan nations (Kanu, 1996). There was more international concern with providing youth with quality education more than ever before. Unfortunately, quality education became synonymous with increasing students' overall performance in schools—performance that was determined by the enrollment rates of students passing through the system (Kanu, 1996). The United Nations Educational, Scientific, and Cultural Organization (UNESCO) 2005 *Education for All - The Quality Imperative Report* acknowledges that there is extensive research showing the positive effects quality education has on the developmental outcomes of a nation. An educated society leads to “higher rates of innovation, higher overall productivity through firms' ability to introduce new and better production methods and faster introduction of new technology” (UNESCO, 2005). If it is distributed appropriately, education

has the power to produce social, political, and economical benefits that leads to overall societal improvement (UNESCO, 2005). Many view quality education from an economical rather than a societal perspective and disregard the positive effects it has on learners such as producing students with highly developed skills, improved attitudes, and behaviors that all result in a better quality of life (Kanu, 1996).

Yet even with added investments in curriculum changes to provide quality education, there have been little changes in student overall performance (UNESCO, 2005). Reports revealed that students in all fields and levels still exhibited similar test-results before investments in education begun (UNESCO, 2005) indicating that there were other factors contributing to student overall learning and performance. Dembélé & Miaro-II (2003) state that teaching practices may in fact play crucial role in student success. Teaching and learning strategies mirroring teacher-centered methods prevent engagement and interaction amongst students and their material, often leading students to perform at significantly lower levels than those who learn in more engaging environments (Dembélé & Miaro-II, 2003; UNESCO, 2005). Studies on Sub-Saharan teaching techniques show that instruction techniques riddled with, ‘chalk-to-chalk,’ and teacher centered pedagogical practices (UNESCO, 2005) produced passive students with limited critical thinking capabilities. They were also not able to engage with the course material in ways that foster deep learning (Dembélé & Miaro-II, 2003). Because these changes may have the greatest impact on student overall learning, changes must be made in teaching practices to ensure that students are actively engaged in classrooms (Dembélé & Miaro-II, 2003). Partnerships with capacity building institutions like USAID-ERA can help Senegalese institutions in their goals of revamping and improving curricula that meet market demands and shape Senegal’s future.

Studies suggest that changing instructional strategies is a slow and arduous process because many of these practices are embedded in the culture of society of instruction (Altinyelken, 2011; Dembélé & Miaro-II, 2003). Webel & Platt, (2015) continue to state that even though professors may wish to change their methods, their individuals teaching beliefs may not match with the surrounding culture or the available knowledge on alternative teaching approaches. And if the environment does not promote or encourage alternative instructional practices, professors will teach in much the same ways that they were taught.

In her study on the contextual challenges of the learner-centered approach in Ugandan classrooms, Sikoyo (2010) identifies that one of the key challenges teachers face in trying to change to learner-centered teaching is that the culture of instruction in Asian and African cultures does not support this method. Uganda, like Senegal showed a long history of teaching that discourages classroom participation, engagement, and inquiry creating an environment where students are accustomed to passive learning. Teachers' perceptions of a good classroom environment directly contradicted with the learner-centered approaches making it difficult to effectively incorporate them in their classrooms (Sikoyo, 2010). Despite her study focusing more on primary and lower levels of education, her study shows how instructional culture affects instructors as well as students' behavior in classroom, behaviors that are passed on to higher education.

Many of the challenges instructors face in introducing new pedagogical techniques is not just overcoming the instructional culture in place, but in acquiring the resources and tools needed to incorporate them. Instructors do not have the flexibility to design their curricula the way that learner-centered approaches intend due to a variety of limitations. Many pedagogical improvement efforts are met with constraints due to large student populations at higher education

institutions. Enrollment rates at Senegal's oldest University of Cheikh Anta Diop (UCAD) has doubled from 1992-2005, with nearly 100,000 full term students at an institution designed for 30,000 (Mbaye, 2008; Ritter, 2011). This increasing demand by students for higher education has placed enormous pressure on institutions and government to provide adequate services and support to both students and professors. Other major obstacles professors face are the lack of financial resources that create shortages in materials and tools for learning; a lack of pedagogical training and support to facilitate teaching and learning; classroom environments and infrastructure unable to meet the demands of large class sizes; weak research and training capacity for students; and government delays in student stipends that result in various forms of student resistance, the most common being student strikes (Altinyelken, 2010; Teferra & Altbach, 2004) . Instructors are expected to teach according to international standards, yet these constraints along with instructional culture encourage the use of more traditional instructional practices that require fewer materials and resources. Therefore, it is crucial to understand the challenges and culture in an environment before changes can be made in instructional practice.

Change and Agency in Education

Much of the literature on learner-centered methods show the countless of benefits these methods have on both the students and instructor. As stated before, the objective of this study was to identify professors' needs for employing the learner-centered approach by looking at their attitudes, social climate, and perceptions of these new methods. However, it is also important to understand what this change in teaching practice means to professors. Instructors under this approach also gain a form of agency of their own teaching practices.

Agency is described as the conscious ability within individuals to execute their actions according to their own volition. This means that instructors have the power to respond to a

variety of circumstances in their pedagogical environment that exhibit leadership and awareness in their role as an instructor. They are able to do so by using their knowledge, resources and experiences to effectively teach their courses (Dembélé & Miaro-II, 2003; Priestley, 2011).

Altinyelken (2010) voices that a prime concern with using learner-centered methods is that we expect instructors to teach using these methods, yet they face highly structured requirements, policies, and curricula that they must adhere to. It is difficult for them to incorporate new teaching strategies because they do not have agency over their own instructional methods (Altinyelken, 2010). Dembélé & Miaro-II (2003) also makes a point that if change is to occur in teaching strategies, attention must be placed on the environmental, societal, behavioral, and cultural factors that encourage/discourage the adoption of innovative teaching practices. Instructors that do not have agency over teaching practices and need the tools and resources available for teacher development to take place (Dembélé & Miaro-II, 2003).

Priestley (2011) points out those instructors who were able to teach in ways beyond teacher-centered practices and those that were able see outside to scope of traditional practices were able to exhibit some level of teacher agency. Agency in this form was boosted partly by the range of available resources they had for teaching, and increase their agency through “dialogue and support” (Priestley, 2011). This type of support, although not exclusively stated in Priestley’s (2011) article can come in the form of professional training and development in learner-centered approaches, such as those offered to Senegalese professors through USAID-ERA. International partnerships can provide professors with an increased network of support and resources in alternative teaching practices and therefore increasing their agency in designing course material.

Conceptual Framework—Theory of Planned Behavior

The theoretical framework guiding this study is Icek Ajzen (1991) Theory of Planned Behavior. Ajzen's (1991) theory measures an individual's intentions of engaging or performing in a certain behavior by looking at three components: an individual's attitude toward a specific behavior (attitude); an individual's belief about what others in his/her environment believe about the behavior (subjective norms); perceived confidence in one's ability to perform the behavior (perceived behavioral control) (Ajzen, 1991; Patterson, 2009). According to Ajzen (1991), these three components to some degree influence an individual's intentions to engage in, perform, or act on the behavior in question. It is important to note that these three factors are each mutually independent concepts and does not guarantee actual behavioral performance. However, knowing one's intentions toward a behavior is the best predictor of actual behavioral performance (Ajzen, 1991).

The Theory of Planned Behavior is an extension of the Fishbein and Ajzen's Theory of Reasoned Action (Ajzen, 1985). This Theory of Reasoned Action only specified the behavioral beliefs that influenced our attitudes to a specific behavior, and our normative beliefs imbedded in the subjective norms. Intention to perform a behavior was simply a result of attitude and the subjective norms. As shown in the diagram below (Fig 1) Ajzen's (1991) revised theory highlighted the importance of perceptions on in individual behavior. He stated that to some degree, our perceived behavioral control has a greater impact on our actual behavioral control because individuals that are confident in effectively performing a behavior are more willing to perform the behavior (Ajzen, 1985, 1991). Perceived behavioral beliefs are made up of control beliefs described as any factors that may facilitate or hinder performance of the behavior. And

so, high levels of perceived behavioral control can lead directly to actual behavioral control, or can simply determine intentions to engage in behavior (Ajzen, 1991; Underwood, 2012).

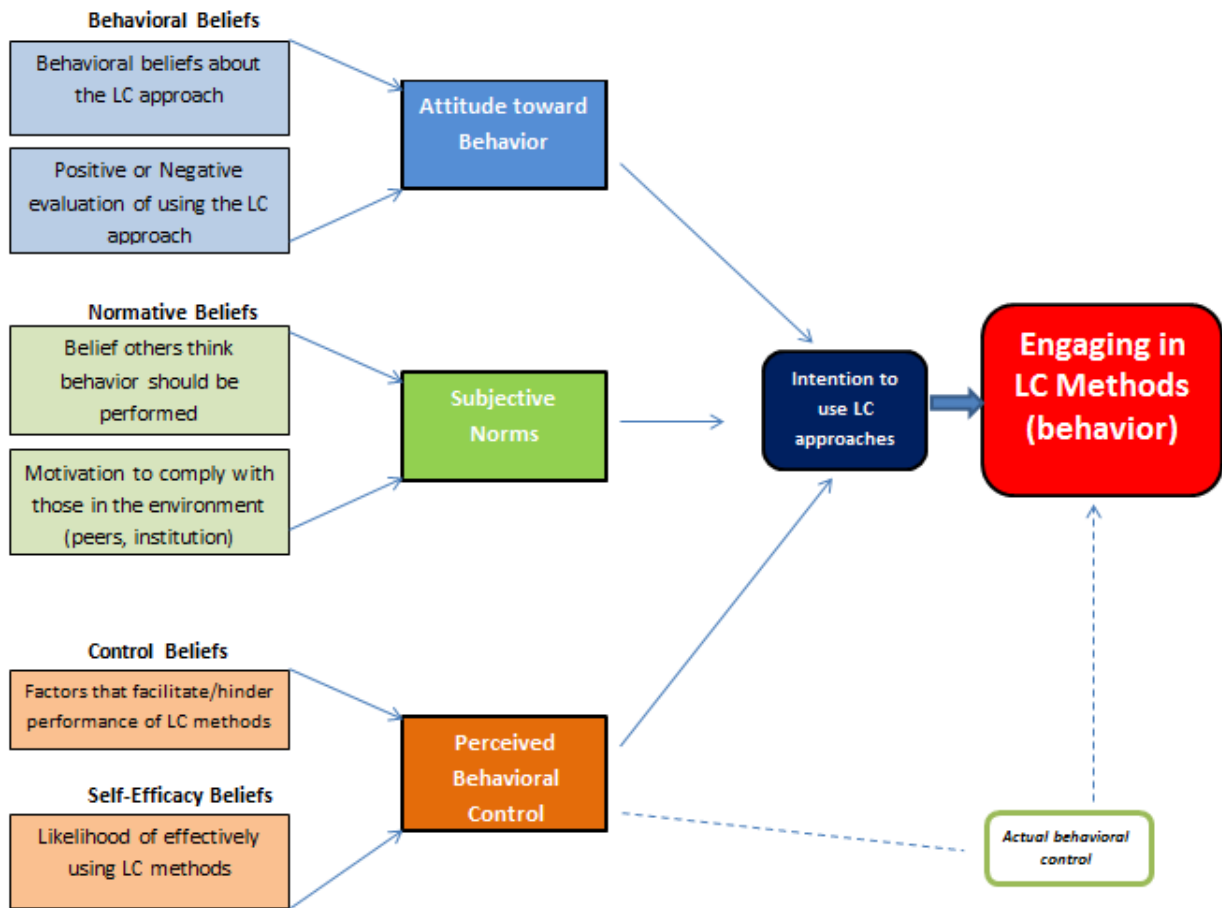


Figure 1. Theory of Planned Behavior and its components parts

Attitude toward a behavior are made up of salient behavioral beliefs. These are defined as personal beliefs an individual creates about the negative or positive outcomes of engaging in a certain behavior that then influences his/her attitude toward the behavior (Ajzen, 1991). If he/she believes that engaging in the behavior will lead to a favorable outcome, then he/she is most likely to have a positive attitude toward it, or vice versa (Ajzen, 1985, 1991). The subjective norms are made up of salient normative beliefs. These are the social factors or influences that

stem from the individual's perception that others have on engaging in certain behavior (Ajzen, 1991).

We used this framework as a guide for both phases of the data collection process in this study. It was deemed a fitting framework for this study because we used the three components of the theory to identify and analyze professors' intentions of engaging in more learner-centered rather than teacher-centered practices. According to the theory, professors will have greater intentions to use learner-centered approaches if they: have positive attitudes toward engaging in learner-centered strategies (attitudes), receive positive reinforcement from their environment to engage in these methods (subjective norms), and believe that they are capable of effectively performing the behavior (perceived behavioral control). The framework will serve as a guide to help identify the challenges in current teaching practices by looking at the three components influencing professors.

Conclusion

Senegal is behind in developing agriculture curricula that provide skills needed in the agriculture sector for its students—practical and conceptual skills that are in high demand (Bravo-Ureta et al., 2012). One of the main challenges in updating course-delivery methods are the barriers professors and institutions face that limit their ability to adapt change. Instructors are all too well forced to use traditional methods due to the limited availability of resources and knowledge on alternative methods. A shift to the learner-centered approach has profound effects on student learning and development. International partnerships with projects such as USAID-ERA can help facilitate the shift to more innovative teaching practices by facilitating access to resources, knowledge, and training. Professional development in this manner can help increase

teacher-agency allowing instructors the power to design courses however best fits the needs of both sector and the students (Dembélé & Miaro-II, 2003).

Instructional practices, although imbedded in much of our culture, environment, and societal norms, can change given adequate resources and time. This study looks at some challenges that professors may be facing in their current teaching practices to identify the needs in instructional practice. It will also look at their attitudes, normative beliefs, and control beliefs to understand what factors may or may prevent, or encourage them from adapting more learner-centered strategies. Lastly, we will explore the impacts international partnerships may have in increasing agency as well as self-efficacy toward more learner-centered teaching strategies.

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CHAPTER 3: METHODOLOGY

Introduction

Like many Sub-Saharan nations in Africa, higher education in Senegal faces a diverse set of challenges affect the quality and efficiency of education (Teferra & Altbach, 2004). One of those challenges included traditional teacher-centered methods of teaching. Teacher-centered approaches emphasize information-memorization and lecture-driven practices that often lead to passive rather than active learning (Brown, 2003; Grunert, 1997). On the other hand, learner-centered approaches involve diverse and active teaching methods that create a more engaging classroom environment. Instructors take the students' needs, abilities, and interests into consideration while constructing a curriculum that ensures active involvement in the learning process (Brown, 2003; Weimer, 2002).

In 2011, USAID-ERA project moved toward with its mission of helping higher-education institutions improve the quality of education and creating curriculum that met the needs of the modern agriculture sector (Bravo-Ureta, Maas, Diouf & Ndoeye., 2012). To do so, ERA conducted short-term technical training workshops with instructors to facilitate in transforming content-delivery methods from traditional teacher-centered to more learner-centered approaches. However, changing to more learner-centered approaches proved a complex task due to the lack of tools, resources, and knowledge for Senegalese instructors on this new approach. Using an explanatory mixed methods research design, data was collected to understanding to help assess the needs for employing learner-centered practices and to understand the challenges agriculture professors face in terms of current instructional methods at three public universities: Cheikh Anta Diop University of Dakar (UCAD), Assane Seck University of Ziguinchor (UASZ), Gaston Berger University of Saint Louis (UGB); and two training institutes affiliated with the University

of Thies: Ecole National Supérieure de l'Agriculture (ENSA), and Institut Supérieure de la Formation Agricole et Rural (ISFAR).

Research Design

This study will use a mixed method design to collect, analyze, and interpret the data results from professors at the five higher education institutions. A mixed method approach was chosen because neither the quantitative nor the qualitative results alone are able to capture the complex dynamics of the study (Creswell & Plano Clark, 2011). Mixing these two methods led to a more rounded analysis of the developmental needs of professors for the purpose of complementarity (Greene, 2007). According to Greene (2007) this purpose “seeks a broader, deeper and more comprehensive social understanding by using methods that tap into different facets or dimensions of the same complex phenomenon” meaning that the results from each strand of the research expand on the overall meaning of the study.

In quantitative research, researchers focus more on numerical data to test relationships between certain variables (Creswell, 2014). It examines variables to answer questions based on grounded theory conducting an unbiased experiment that tries to understand a certain phenomenon. Qualitative research on the other hand focuses on conducting research to explain and understand an individual behavior or actions to understand a social phenomenon (Creswell, 2014). Qualitative research also involves close researcher-participant interaction and produces results that have a much deeper and complex analysis on the proposed problem (Creswell, 2014).

Because both quantitative and qualitative approaches are being used, four key components must be considered: 1) Determining which of the two strands (either the quantitative or qualitative) has a higher priority over the other; 2) The level of interaction between the two strands 2) The timing at which each strand will be collected and; 4) The point at which the two

strands will be integrated i.e. the data collection phase, the analysis phase, etc. (Creswell, 2014; Creswell & Plano Clark, 2011).

This study used an explanatory sequential design that consists of two phases: the first phase was a quantitative data collection and analysis strand in which data was collected using survey questionnaires. The quantitative phase identified the key constraints and challenges professors were facing in their learning and teaching strategies. It also helped identify the factors that were preventing or encouraging them from adopting learner-centered approaches in their classrooms. The survey asked questions about current teaching practices, attitudes and perceptions toward learner-centered approaches, social climate at institutions, and their perceived confidence in effectively incorporating them in the classroom.

The second qualitative phase data collection tool were semi-structured interviews with professors at the institution. This phase was important because it gave further insight on where the gaps in teaching might be occurring. Interviews were deemed most appropriate to explore some of the main points professors highlighted in the former phase such as the challenges in teaching, the influences, and their perceptions of the learner-centered approach.

In regards to timing, the study used sequential timing with data collected at separated times. The quantitative data collection phase was conducted in August 2014 followed subsequently by the qualitative data collection in June 2015. Results from the quantitative survey questionnaires were used to design the qualitative interviews. Results from both phases were then combined to discuss the overall findings, conclusions, and outcomes of the study. Even if the responses from the quantitative data were used to design the qualitative, there was an interactive level of interaction between both data analysis strands. This means that we mixed the results from both phases before conducting a final analysis of both data sets (Creswell & Plano Clark, 2011).

Lastly, there will be equal priority of both strands because both parts will play an equal role in looking at the problem (Creswell & Plano Clark, 2011).

The Theory of Planned Behavior (Ajzen, 1985, 1991) was used as framework to construct the a 4-part survey questionnaire that included ranking questions, 5-pt Likert-type scales that asked professors rank their level of agreement on certain topics on a scale from 1-5, and close-ended questions. The Theory of Planned Behavior and quantitative phase of the study were used as a template to design the 3-part semi-structured interview questions. Results from the survey and interviews were used to design a set of recommendations for future studies, and served as a guide for the five targeted institutions and aid agencies in creating relevant training modules.

The participating institutions

The five participating institutions were chosen to participate in the study. These institutions were selected due to their close involvement with the USAID-ERA project. Established in the 1957, Cheikh Anta Diop University is one of the oldest institutions in West Africa (Ndiaye, 2003). The university has grown in both enrollment rates and programs, offering courses in the humanities, technical sciences, economics, law, medicine and much more (Ndiaye, 2003). Although UCAD does not have a specific agriculture program, participating professors taught courses within the Faculty of Science and Technology that included earth sciences, animal and crop production courses, ecology and many other agriculture related sciences (UCAD, 2012).

Senegal's second oldest university, l'Université Gaston Berger or Gaston Berger University (UGB) is located at the outskirts of Saint-Louis in Northern Senegal. Founded in 1990, the university was created as an extension of UCAD as a school of the Arts and Humanities but became an independent university in 1996 (Bravo-Ureta et al, 2012; University,

N.D). Today, the institution offers a variety of courses in 8 Faculties (similar to colleges) and 4 institutes, along with 2 graduate schools that train students in research, lab, and field activities (University, N.D). Participating professors were from the Faculty of Agronomic sciences, Aquaculture and Food Technology that is made up of four sections (or departments): Aquaculture, Animal and livestock production, Agronomy and crop production and, Food technology.

L'université Assane Seck Ziguinchor or Assane Seck University of Ziguinchor (UASZ) is Senegal's newest public university located in the Casamasnce region in southern part of Senegal. Established in 2007, the university is made up of 4 faculties of research and 3 research labs (Bravo-Ureta et al., 2012; USAID, 2011; 2013). The two professors from UASZ taught in the Faculty of Science and Technology with specialization in agro-forestry.

L'Ecole Nationale Supérieure de l'Agriculture (ENSA), and Institut Supérieure de la Formation Agricole et Rural (ISFAR) are two agricultural advanced training schools that train professionals and students in agriculture, animal managements, forestry and water systems (Ndiaye, 2003). Both are part of the University of Thies and are much smaller in terms of student population and professors.

Previously known as the l'Ecole Nationale des Cadres Ruraux (National School of Rural Studies, ISFAR was established in the 1965 to provide knowledge, research, and practical skills necessary for those wishing to succeed in the rural and agricultural sciences. It offers a variety of course within 3 different engineering degree programs (Crop Production, Animal Production, and Water & Agroforestry), 2 professional Masters degrees (Agriculture and rural development and Management of protected areas and wildlife) and 1 professional degree in Rural and Agricultural council ("Université de Thiès ", 2011)

Established in the 1981 under the name of d'Institut National de Developpement Rural (*INDR*), ENSA became part of the University of Thies in 2007. ENSA provides training to agricultural engineers and students wishing to understand the agriculture development by looking at the scientific, technical, and social aspects involved in the agriculture sector (ENSA, 2013). The institution offers engineering diplomas in crop production, animal production, rural engineering, and economics and rural sociology, as well as professional licenses in Natural resources management, Crop production and Agro-resources, and Animal industry & production. It also offers students with professional Masters Degrees in Forestry, Sustainable management of natural resources. There are currently 23 professors teaching at the institution (ENSA, 2013; "Université de Thiès ", 2011)

Data collection tools

For the quantitative phase, the primary data collection tool was a 4-part survey questionnaire containing 5-Likert type scales questions that asked professors rank their level of agreement on certain topics on a scale from 1-5; dichotomous “yes” and “no” questions; ranking questions; and close-ended responses.

We constructed the questionnaire using Icek Ajzen's (1985, 1991) “Theory of Planned Behavior” with each section focusing on a component in the theory: professor's attitudes toward learner-centered approaches; influences from their social environment about teaching strategies; current teaching practices; and their perceived confidence in effectively incorporating new proposed methods.

The first section asked participants about their demographic and teaching background. It included ranking questions that determined professors' role at their respective institutions; close-ended questions on courses they currently taught; average class sizes; and teaching experience.

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The second section focused on dichotomous “yes” and “no” and close-ended questions to identify current teaching and learning strategies. The survey also asked about evaluation methods, frequency of evaluations, teaching techniques, as well as major challenges (pedagogical or material) currently faced. This section also included 5-type Likert scales that assessed professors’ attitudes toward current and new learning methods by asking them to indicate their level of agreement on a scale from 1-Good to 5-Bad.

The third section measured participants’ social pressures felt from their peers, administration, and institution in incorporating new learner-centered practices. They were asked to indicate the level of agreement with statements about their social environment from 1-Strongly agree and 5-Strongly disagree. The last section of the questionnaire looked at professors’ perceived confidence in applying new methods into their curriculum. Responses were measured on a scale from 1-Strongly disagree to 5-Strongly agree.

Professors were asked about evaluation methods based on the levels of Bloom’s Cognitive Domain. The six hierarchical categories are arranged in increasing degrees on difficulty to show the levels at which students develop higher levels of intellectual skills and abilities (Felder & Brent, 2004). The six domains from the lowest to highest include: knowledge, comprehension, application, analysis, synthesis, and evaluation. We asked professors to indicate evaluation frequency per module to understand and determine where gaps in teaching might occur.

For the qualitative phase of the study, the primary data collection tool was the responses conducted from semi-structured interviews conducted with key informants at the institutions. Semi-structured interviews are a form of data collection in which the data is collected by asking participants to give a one-on-one account of their feelings, opinions, and experiences about a

certain phenomenon (Ary, 2014). Semi-structured interviews are used when the interviewer chooses a certain number of questions to ask the participant but leaves room for modification and changes of the questions during the interview process (Ary, 2014).

Findings from the quantitative phase and The Theory of Planned Behavior were used to design the interview questions. These questions were intended to expand on the key components and characteristics identified in the survey, as well as providing new insights on the challenges, the influences, and attitudes/perceptions professors had on the learner-centered approach. The interview was divided into four main sections. The first section was the demographic information was to glean insights on professors' demographic information, their identity as instructors, and the knowledge on current and new teaching practices. Responses helped frame professors' roles and how they self-identified within their respective institution. Questions included what classes they taught, class sizes, administrative duties, their own educational background, etc.

The second section was on professors' attitudes, thoughts, and beliefs about teaching and gave a brief description of the current teaching practices being used in the classrooms. Questions included course preparation and delivery techniques, practices found to be the most/least effective to facilitate learning, expectations from students, learner-centered practices being used in the classroom, and challenges they currently faced in teaching students. The last section asked questions on the social normative beliefs that informed the subjective norms professors had about teaching. The questions also touched on the perceived social pressures professors felt while engaging in certain teaching practices. Some of the questions asked about any support systems in place for professors, trainings on the learner-centered approach, factors that helped implement new teaching strategies in the classrooms, any influences in their teaching strategy, and ease of changing their teaching practice.

Data collection protocol and analysis

For the first phase of the study, data collection took place in August of 2014. The location, date, and the time for conducting the survey-questionnaires were determined in July 2014 with the help of ERA staff and the institutions. All data collection took place at the institutions, except for participants from UASZ who met at the USAID-ERA office in Dakar to partake in the survey-questionnaire. To ensure that the language and questions were appropriate for the targeted audience, two ERA staff translated both the survey questions and consent forms from English to French.

Prior to taking the survey, professors were given a short presentation on the study's purpose and objectives, the survey-questionnaire sections, details on survey participation, and the informed consent procedure. This ensured that all participants had a clear understanding of the study and the data collection procedure. Professors were asked to sign and date the consent form, but they did not provide any other identifying information. The questionnaire took an hour to complete and all the data provided was kept confidential but not anonymous. Codes were created for each questionnaire mainly to identify if there were certain needs specific to institutions. The 6 digit-code included the first and last initial, institution number (U1-U5), and a random number. All responses were stored in a password protected computer and consent forms were stored in separate but locked and secured environment. Data was analyzed using a mode frequency analysis to measure the frequency of responses for each question within the sections.

The qualitative portion of the study took place in June 2015. Professors were contacted prior to the interview process to inform them of the interviews. The interviews were held at each professor's office at an agreed time. Before beginning the interview process, participants were given a brief description of the study's purpose and objectives, the structure of the interview

process, and the informed consent. After signing the informed consent form and agreeing to partake in the interview, participants were asked a number of questions on their teaching practice. The interviews were recorded using a Samson Zoom H2 audio recorder and notes were taken to record additional behaviors and responses. Almost all the interviews were conducted in French.

Interview responses were later translated and transcribed with the help of Express Scribe Transcription Software. The software's main use was to slow down recordings to be transcribed and translated. For reliability and triangulation, all interview recordings were reviewed and translated by a third-party French-speaking Senegalese to ensure that transcriptions were appropriate and correct. All identifying information was kept confidential. ATLAS.ti software was used to analyze the interview data. Selective coding using the Theory of Planned Behavior was used to analyze all interview data. According to Corbin & Strauss (1990), selective coding is a coding process in which certain categories related to a main central category are used to give an in-depth explanation of the phenomenon of study. Categories typically represent the main ideas or behaviors being studied and allow researchers to relate certain categories to others in order to understand the relationships or the variations that may occur between other categories during the analysis (Corbin & Strauss, 1990). Categories were organized based on the responses that fit within the theoretical framework, but other themes such as instructors' role in the courses, evaluation strategies, etc. emerged through the analysis process. This type of coding was beneficial because it helped identify the key themes, while allowing for an expansion on some specific components that arose during the analysis process.

Target population

Participants in the first phase of the study were selected using comprehensive sampling techniques. Comprehensive sampling was chosen due to the limited number of full-time professors in agriculture related fields. Data collected from the sample would be used to provide relevant insight about the general population concerning learner-centered approaches (Ary, 2014). Two general criteria were used to determine if participants were eligible to partake in the survey-questionnaire. First, participants had to be full-time professors teaching in at least 1 of the 5 institutions. This was especially important because higher education institutions frequently rely on part-time professors known as *vacataires*¹ to teach specific subject areas in their courses. The second criterion was that participants had to be teaching (or recently taught) and agriculture related course in a formal classroom environment.

As shown in Table 1, thirty-five male and five-female professors participated in the questionnaire with most of the survey participants from UCAD and ISFAR. Student populations greatly varied between the institutions with UCAD reporting average class sizes of more than 200 students, while the ENSA and ISFAR reported average classes of 37 students.

¹ Vacataire professors are individuals from higher-education or private sector contracted to teach specific topics in which full-time professors lack expertise. They serve an important teaching role in Senegal's higher education system due to the shortage of full-time professors at the institutions. Teaching assignments vary in length (from 1 week to a whole semester) and most teach at multiple institutions at a time. For this reason, they face different sets of challenges and constraint than full-time professors teaching at just one institution.

Table 1.*Demographic information for survey questionnaire, August 2014*

Characteristic	UCAD	UGB	Assane Seck	ENSA	ISFAR
Gender					
Male	10	4	2	7	12
Female	3	1	0	1	0
Avg. Teaching Years					
Male	21.5	12.5	4.5	15	23.3
Female	13.3	10	-	11	-
Avg. class sizes (students)	238	75	50	37	37
Total participants (n = 40)	13	5	2	8	12

For the qualitative phase, 3 to 4 professors were selected from each institution to participate in the one-on-one semi-structured interviews. Professors had to be full-time professors at one of the five institutions teaching (or previously taught) at least one agriculture related course. The specific selection criteria included at least one professor who was:

1. Late adapter of change—a faculty member who needed more information and resources prior to making any changes in their teaching strategies. It was important to understand why he/she may resist change and information or resources he/she may need before choosing to incorporate innovative teaching practices in their curriculum.
2. Early adapter of change—a faculty member who is easily persuaded to make changes in their teaching strategies or overall practices. It was important to understand why he/she may wish to adapt learner-centered methods and in what ways he/she intended to facilitate the methods in the classroom.
3. ERA representative—faculty member who served as the liaison between USAID ERA and his/her institution. He/she was most involved in workshops, activities, and events hosted by

ERA and served to as a representative of his/her institution. We made the assumption that this individual was likely to be aware of the situation, needs, and constraints facing his/her institution.

4. A change agent—faculty member described as the person most likely to bring change within the department/institution. The change agent can also take on one of the previous roles mentioned before.

This selection criterion was chosen because it allowed for insight on the reasons why certain professors may or may not choose to adapt new teaching and learning strategies. Professors were recruited based on previous interactions with ERA project staff. Those that fit the criteria were contacted and given information about the study and the interview process. As seen in Table 2, a total of 16 professors participated in the one-on-one interviews.

Table 2.

Demographic information for semi-structured interviews, June 2015

Characteristic	UCAD	UGB	Assane Seck	ENSA	ISFAR
Gender					
Male	3*	4	2	2*	4
Female	-	-	0	1	0
Avg. class sizes (students)	>400	~230	60	50	55
Total participants (n=16)	3	4	2	3	4

*One of the participants did not have a recorded interview

Professors were asked to give small introductions to help frame their identities and roles within the institutions. They were also asked about their class sizes, the courses they taught, responsibilities within their institutions, educational background and years of teaching

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experience. No other identifying information was collected. Names and other identifying information were changed in the analysis portion to maintain anonymity.

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CHAPTER FOUR: PERCEPTIONS AND ATTITUDES OF SENEGALESE PROFESSORS TOWARD LEARNER-CENTRED INSTRUCTIONAL STRATEGIES

Introduction

Agriculture in Senegal plays a leading role in the Senegalese economy employing nearly 70% of its population (Agency, 2014). Unfortunately, agriculture productivity and development still fall behind and has remained stagnant in the recent decades. Efforts to increase agricultural productivity require substantial improvements in the agriculture sector, with continuous investments in agriculture education and research institutions (Bravo-Ureta, Maas, Diouf, & Ndoye, 2012; Chakeredza, Temu, Saka, Munthali, Muir-Leresche, Akinnifesi, & Sileshi, 2008).

In 2011, the USAID Education and Research in Agriculture (ERA) project in Senegal was implemented to help strengthen the nation's agriculture education, research, and training sector to produce a skilled and ready workforce entering the agriculture sector (USAID, 2011; 2013). Initial assessments showed some constraints in higher education institutions that included instructional practices that focused more on knowledge acquisition (Guilbaud, Abaye, Gueye, & Li, 2012). One of the challenges addressed were the traditional teacher-centered methods that dominated many higher-education classrooms. These were methods characterized by an authoritative teacher-figure and lecture-driven courses (Brown, 2003; Weimer, 2002). And so, USAID-ERA began conducting short-term trainings for professors to assist in implementing more learner-centered methods of instruction in their courses (Tech, 2013).

Since the early 1990's, many efforts have been implemented to shift from content-delivery approaches that are more 'teacher-centered' to those centered around the learner's interests and needs. Learner-centered approaches allow students to acquire new information, practice and develop new skills, while being consciously aware that learning is occurring

(Grunert, 1997). However, changing from teacher-centered to more learner-centered approaches requires a more than just curriculum changes—there needs to be a change in instructors attitudes and perceptions toward an instructional approach, confidence in the ability to change current methods, and understanding the factors that may facilitate or hinder the process (Brown, 2003).

Professional trainings and development can facilitate instructor-agency in allowing professors to design and deliver courses that fit the needs of the agriculture sector and that promote student learning (Dembélé & Miaro-II, 2003). The purpose of this study was to understand professors' attitudes and perceptions toward these new methods, identify their needs for them, and some challenges they faced in terms of current teaching and learning methods at Cheikh Anta Diop University of Dakar (UCAD), Assane Seck University of Ziguinchor (UASZ), Gaston Berger University of Saint Louis (UGB), Ecole National Supérieure de l'Agriculture (ENSA), and Institut Supérieure de la Formation Agricole et Rural (ISFAR).

Methodology

Guided by The Theory of Planned Behavior (Ajzen, 1985; 1991), an explanatory mixed method study was conducted consisting of a quantitative survey-questionnaire and qualitative semi-structured interviews. The survey questionnaire was conducted in August 2014 and the semi-structured interviews conducted in June 2015. Both data collection tools were used to assess professors' teaching strategies, attitudes toward learner-centered methods, social climate at the institutions, perceived confidence in effectively incorporating these methods, as well as the challenges faced in current teaching and learning approaches. Participants for both the survey and interviews were full-term professors, currently teaching (or recently taught) at one of the five institutions in a formal classroom environment. A total of 40 professors participated in the survey-questionnaire and 16 professors in the interviews.

Results from both phases captured professors' teaching strategies, their attitudes and perceptions of these new teaching strategies, factors that facilitated/hindered their adoption of these methods, and highlighted some of the challenges that they faced in teaching.

Frequency analysis was used to interpret survey data. Findings from the survey data and the theoretical framework were used to design and analyze the interview. ATLAS.ti software using selective coding was then used to analyze interview data.

Results

Current teaching strategies

One of the primary objectives of the study was to identify whether professors were using some learner-centered approaches in their courses as well identifying what teaching methods were currently in place. In regards to teaching strategies, survey data revealed that the primary teaching tools professors used were hands-activities ($n = 39$), visual aids such as charts, graphs and maps ($n = 39$), and lecture/PowerPoint presentations ($n = 38$). As shown in Table 4, professors also used a variety of other teaching strategies to accommodate the different learning styles such as discussions, role-playing, course summaries, and much more. In addition, many indicated using many other teaching approaches in conjunction with the lectures/PowerPoint presentations to facilitate the student learning.

Overall, survey data revealed that professors were using some LC approaches in their courses. And so, professors were asked about their specific teaching techniques in the interview portion of the study to get a better understanding on specific methods currently in place. Each professor gave a brief description of their typical teaching day including any course planning, preparation, delivery, and evaluation techniques in use.

Table 3.Teaching tools used by professors to accommodate different learning styles ($n = 40$)

Teaching tools	Yes	No	N/A
Hands-on activities	39	1	0
Charts/graphs/maps	39	0	1
PowerPoint Presentation	38	1	1
Discussions	37	1	2
Field-trip	29	7	4
Oral summaries by yourself after lectures	25	8	7
Using bold colors	24	8	8
Oral summaries by students after lectures	17	13	10
Multi-media presentation	13	15	11
Audio lectures	10	19	11
Role-play scenarios	4	21	15

Course preparation was both an individual and collaborative process that involved individual professors, their peers, professionals in the field, and students. At the beginning of every academic year, professors at UGB met and assembled their syllabi, their course content, and agreed on the major topics to be discussed through the course. Preparing the lab and practical portion of the courses was also a collaborative process particularly at UCAD. One professor stated that it was a way to ensure that all students were learning the same material, as well as gaining similar skills needed to succeed in the sector. Some professors, particularly those at the training institutions (ENSA and ISFAR) received input from former students working in the field that would help them design courses that incorporated the knowledge and skillset demanded by professionals. Others professors used books, journal articles, and online sources to prepare their courses while some included material based on the topics and information they felt

to be the most relevant. Professors also used online resources from other international institutions teaching similar courses as a preparation guide to design and plan their courses. Another teaching strategy used by nearly all professors was the course syllabus. UCAD, ENSA, ISFAR and ENSA mandated that every professor create and distribute a course syllabus to students. Most stated that their syllabi included the course objectives, main concepts/topics to be discussed, evaluation methods, and additional bibliographic support/references and served as important teaching tools for their students.

Interview data also revealed that the primary teaching tool used to deliver course material and information were PowerPoint and lecture presentations. All 16 professors used PowerPoint presentations in their courses. One professor stated that “*we first prepare the lectures, what’s called the PPT. It is the main point—main line of the subject we are talking about and we deliver [the lecture material] to the student*” indicating that content-delivery approaches focused on lectures and providing students with information. However, they all expressed in addition to the lectures, other methods such as visual aids, charts, graphs, illustration, asking students’ questions, and elaborating key points on the board were included in every class. These techniques not only helped students better understand the material, but gave students a chance to interact and engage with the material and each other and creating an active class environment.

Prior to starting their lectures, some professors indicated that they conducted small review sessions as a tool to refresh previous knowledge and give students the opportunity to answer any questions they had on the last course. Participatory methods that encouraged student engagement were techniques used by nearly all professors. The most common approaches mentioned were in-class discussions and asking students questions on the material. One

professor stated that it allowed students to feel comfortable communicating in front of peers and build on their communication skills needed in the workforce.

During the survey and interviews, instructors at ENSA and ISFAR mentioned that they utilized case studies and anecdotes to provide context on how the class material applied in the real world. Students found these methods to be particularly effective because it allowed them to make real-world connections with the theoretical material. Professors at Assane Seck incorporated movies and video clips into their courses, stating that these techniques were especially useful in making up for lost teaching time during periods of strikes. Not only is it easier on instructors, but on the students as well; *“students appreciate it [films/short clips] because they say, they prefer to see rather than to hear [the lectures].”*

Other teaching techniques mentioned in both the surveys and interviews were field-trips and outdoor work. During the interview, a professor from ISFAR stated that he attempted to have at least one field-trip with students to the various research stations and centers around Senegal. It was an opportunity for his students to gain hands-on experience and skills not afforded in the classrooms, as well as interact with the professionals in the agriculture sector. Students at ISFAR also worked in vegetable gardens and nurseries as a way to practice their knowledge. In addition, interview data revealed that professors had students prepare part of the course material to present to their peers to have students take some responsibility of their learning, as well as having students learn from their peers. Other techniques mentioned included take-home activities and homework, written reports, providing illustrations, individual as well as group projects, and many other activities.

Professors were also asked about what teaching tools they felt were the most effective in facilitating the learning process for students. This allowed for a comparison between techniques

most frequently used versus those perceived to be the most effective to see if there were any potential gaps in teaching that were occurring. Table 4 shows that of the 40 participants who took the survey, 19 felt that lectures/PowerPoint presentations were the most effective teaching tool, followed by group problem solving and discussions ($n=15$), and practical work ($n=9$).

Table 4.

Professors’ perceptions on effective teaching techniques

Teaching techniques	Number of professors
Lecture/tutorial presentations	19
Solving problems in groups	15
Discussions	15
Practical work	9
Problem based learning	4
Case studies	2
Mentoring/coaching	2
Group work	2
Individual research	2
Videos and video presentations	1
Individual research on a topic/subject	1

However, when professors were asked during the interviews about the methods they found to be the most and least effective, professors unanimously agreed that LC methods (those that were active and engaging) were the most effective and that PowerPoint presentation and lectures were the least effective methods. Students succeeded and understood material when the course and content-delivery methods were learner-centered methods. PowerPoint/ lecture presentations

that included little interaction with the students – those that involved the professor giving notes and students listening—were the least effective because students became passive learners who were not interested or motivated in the course material. Students enjoyed active teaching methods like practical work, field-trips, case-studies discussions, etc. that encouraged classroom interaction and disliked methods that limited or restricted opportunities for classroom interaction. They elaborated that traditional lecture-driven courses were effective only when used in conjunction with learner-centered methods. They also expressed that the learner-centered paradigm, although effective, was not always practical given the many constraints and limitations they faced in teaching.

Results from both interviews and surveys showed that there were LC methods being incorporated into the classroom. Professors expressed interest and enthusiasm in the new approaches and felt that they were beneficial in enhancing student learning. In fact, nearly 80% of all the professors ($n = 34$) stated that given the proper resources and teacher training, they would make a marked shift to improve their current teaching strategies.

Attitudes toward learner-centered approaches

Interview and survey data indicated overall positive attitudes and perceptions toward the LC approach. In the survey-questionnaire, 80% reported having positive attitudes towards the learner-centered methods ($n = 35$) and 92% stated that incorporating them in classrooms would be good ($n = 37$). Nearly all professors stated that they used some form of learner-centered approach in their courses and felt that they were beneficial in encouraging student learning. Over half ($n = 23$) felt confident enough to use LC strategies in their own classrooms but only 20 professors felt that they would be using these methods in the correct manner. Their primary

concern was the lack of training and information on LC pedagogical practices because it was a new teaching practice in Senegalese instruction.

Interview responses were similar. Professors had positive attitudes toward teaching techniques that focused on students' interests and those that promoted an active learning environment. However, despite feeling that these methods were good and beneficial, many expressed that it was difficult to fully incorporate in courses for a variety of reasons: First, the learner-centered approach was new and different and instructors that were unfamiliar with the approach were reluctant to change their teaching practice. Unlike traditional methods that required little preparation and execution time, the learner-centered approach needed more in-and-out of class time. Professors had to be able to incorporate different teaching techniques and design content that fits different learning styles for each course. Second, learner-centered approaches required additional resources to implement. One professor at UASZ expressed that even though videos and films were extremely helpful for students, the lack of speakers and projectors made it hard for him to add into the curriculum. The lack of materials to facilitate LC approach was difficult. Finally, some professors felt that students were resistant to these new approaches and preferred traditional teaching practices. This was also because they were unfamiliar with the approach and were hesitant to engage in the different in-and-out of class activities. Yet despite the difficulties, most, if not all professors had positive attitudes and perceptions toward LC methods.

Institutional environment and social climate

In regards to the social climate, survey results indicated that professors felt their university was a good place to work and felt little to no pressure from administrations or peers about changing their teaching strategies. However, 45% of professors ($n = 18$) admitted that their

administration rarely discussed innovative teaching techniques and 50% ($n = 20$) stated that there were few, if any, available resources for developing learner-centered teaching. As with the survey results, interview participants added that they felt comfortable discussing new and innovative methods with their peers and felt relatively comfortable teaching in the manner they felt was most appropriate. Subjective norms were relatively positive, indicating that most professors felt their peers and others within their institutions would approve of engaging in LC behavior. However, responses from both the interviews and surveys showed that engaging in LC behavior was not quite customary in Senegalese instructional practice and that more traditional teaching practices were still prevalent in classroom instruction

Peers and colleagues

Interview results also revealed several factors that influenced professors' current teaching strategies and determined if they would engage in learner-centered approaches. The first was the influence of peers and colleagues. Professors were asked whether their peers or colleagues affected the way they planned or delivered their courses to identify some current subjective norms in place. Overall, professors felt at ease discussing with each other about new teaching strategies. As mentioned earlier, course planning at UCAD, UASZ, and UGB was a collaborative effort. Professors expressed that the continued and close interaction with others helped nurture positive and open relationships with their peers. They indicated that they frequently exchanged advice, main points, ideas, and new information on different pedagogical techniques and ways to improve their current practice. Some believed that their colleagues had the ability to positively influence teaching behaviors toward more learner-centered approaches. However, professors from UGB and UASZ shared that even though there was discussion amongst themselves on new pedagogical techniques (i.e. e-learning), discussions that were specific to the learner-centered

approach were not common. At ISFAR, three professors felt comfortable discussing teaching methods with their peers but one was still apprehensive about discussing the approach.

Professors frequently engaged in informal exchanges on new teaching techniques especially after the USAID-ERA trainings.

Overall, professors stated that their peers had some influence on their teaching habits. Professors were at liberty to design their courses without intrusion from others. Professors welcomed input from their peers as a self-improvement strategy to help them update their courses accordingly. Their peers and colleagues influence also allowed opportunities for instructors to self-reflect on way to improve their courses.

Pedagogical support and training

Interview results revealed that the presence of pedagogical support and training influenced whether professors engaged in LC practices. At UCAD, the primary support system mentioned by professors was the *Plateform de la Pedagogie Universitaire de l'UCAD or PPU*. Senegal's Ministry of Education has undertaken some key initiatives to prepare and enable higher education professors to effectively carry out teaching. One of those initiative included PPU. Its main objective is to provide trainings, resources, and support to instructors at all levels of higher education on the best practices in instruction (Camara, 2013). PPU served as a key support system for professors looking to improve their instructional practices, learn about new methods, or those who need additional information about any aspect of teaching and learning. Professors at UCAD felt that it was influential resource because it functioned to serve and meet professors' needs in pedagogical practice. However, because it was still a relatively new institution, some expressed that not all professors at the university were aware of its purpose and function and that it played a small role in influencing teaching strategy. Overall, participants

from UCAD felt that PPU had a positive impact and influence in instructional strategy and served as an excellent support system for other professors (especially recently hired professors).

Another pedagogical support system mentioned by professors was the *Center for University Pedagogy (CPU)* at UGB. Established in 2014, CPU functioned to assist new professors to teach according to university standards. One professor explained that the center hired pedagogical specialists who worked in partnership with ERA staff and personnel to organize training workshops on different curriculum and curriculum-delivery approaches. Professors agreed that CPU was a great support system even though its impacts were yet to be felt by all.

Many professors that we interviewed expressed that their time at the *École Normale Supérieure*, now referred to as the *Faculté des Sciences et Technologies de l'Education et de la Formation (FASTEF)* had a profound impact on their current teaching practice and served as a beneficial support system. One professor explained that many of his current pedagogical techniques and teaching styles, including creating a course syllabus, were a direct result of his time at the *École Normale Supérieure*. Another expressed that the *Ecole Normale Supérieure* played an important role on how he taught his courses and helped him develop a profound understanding on teaching best practices such as distributing course evaluations; *“I tried to apply these techniques in my classes. So sometimes, when I finish a class or a program, I give students paper for evaluation for the teaching, and how they think I can improve.”* One other professor indicated the institution introduced him to LC and interactive teaching approaches, giving him first-hand experiences on how effective it was in helping students learn. Interestingly enough, after graduating from the institute and taking a few years away from teaching, one professor

admitted to reverting back to using more using more traditional methods when he returned as a professor.

“The first influence [on teaching] was what I was training [at the École Normale Supérieure]. In these trainings, I was convinced that that was the right way to do it. And not everyone does. But after, I spend many years doing my PhD, doing my research. So I was away from teaching. So when I came back, it was easy to do [teach] like others. Come and lecture and let them [students] take notes.”

He felt that the École Normale Supérieure was a useful resource in introducing instructors to active teaching methods, but instructors also needed to have continuous pedagogical training to utilize the new methods in their courses.

Nearly all the professors indicated that their institutions worked directly or indirectly with the École Normale Supérieure to provide trainings, workshops, and seminars on different aspects of pedagogy. ENSA worked closely with specialists to provide a two-week training program to new and current professors on basic pedagogy and evaluation techniques. It served as an important support system for professors that need additional assistance or new knowledge on teaching methods.

Experiences as a student

One other factor highlighted in the interview results were professors’ experiences as students to identify if it had any influence on the way instructors designed or delivered their courses. According to Webb and Platt (2015), teaching practices and methods are often imbedded in instructional culture and practice that they were taught under. Nearly all the professors stated that their former instructors influenced their current teaching practices to some degree.

Reflecting on their experiences as students, most professors indicated that instruction was primarily teacher-centered, with professors dictating the course material and lectures while students took notes. There were few opportunities for student-teacher interaction resulting in passive learning environments and bored students. Instructors simply presented the lecture to students who in turn memorized the information for an exam at the end of the course. As one professor explained, “*what I can tell you was there [were] some teachers that I did not really appreciate; (laughs). I am really sorry for that. They were hard with students, and they did not want to answer some questions. I’m not—I do not have time, and they were going fast with the classes [course material]. It was very difficult to get the message [that] they wanted to deliver.*”

Almost all professors expressed that the teacher-centered approach was the least effective method. In fact, many disliked the method all together, stating that there was rarely ever a relationship between instructors and students. One professor reasoned that this teaching approach was the most practical because professors were unfamiliar with other teaching approaches due to a lack of pedagogical training. “*I think that when I was a student, professors did not receive pedagogy learning [training]. Yeah, so I think the teaching at the university when I was a student focused mainly on knowledge. There was little interaction between students and teachers.*”

However, not all approaches were bad. Practical and hands-on teaching approaches were the most effective and left the biggest impression in their learning. Another recalled a former professor who was able to make the material more interesting by making it relatable and relevant to their lives. Some appreciated methods that involved student-teacher interactions and small-group activities that promoted interaction outside the classroom. Others felt that the internships, practical work, and fieldwork were the most useful in facilitating learning as well as giving them the opportunity to apply theoretical knowledge to real-world approaches.

Responses also indicated that professors that had good learning experiences attempted to incorporate some of the methods they acquired from their former teachers into their own courses. One professor expressed that there were former instructors whose teaching methods greatly impacted his learning motivating him to include similar strategies into his own curriculum. In fact, professors that provided detailed explanations of class material in ways that facilitated learning process were so helpful in learning that one professor admitted to still using his notes as teaching references. However, professors agreed that their experiences as students affected the ways that they engaged and interacted with students.

International partnerships

According to professors, partnerships with international institutions played the most influential role in providing resources, training, and support in their teaching practices. The USAID-ERA project was mentioned by professors at every institution as being an important and beneficial support system in encouraging the adoption of new teaching approaches. Workshops/trainings conducted by the ERA staff on syllabi development, e-learning, evaluation methods, and international trips hosted by the project were extremely beneficial in receiving resources on pedagogical practices. In fact, one professor stated that prior to the ERA involvement at ISFAR, there was little discussion on instructional practice.

ERA also provided material resources like as computers for computer labs, laptops for instructors, and school buses that eased transportation on field-trips and out-class activities. Additionally, professors were able to attend workshops, trainings, study-groups both domestically and internationally with the support of other international partnerships. These international trips were helpful for acquiring new knowledge, networks, and resources to facilitate their instructional practice.

Partnerships between institutions and The World Bank also served as crucial support systems. According to professors at UGB, The World Bank Assistance Program with the Department of Food Sciences at UGB helped in providing resources (desks, chairs, etc.) to improve and create a comfortable classroom environment.

Institutions influence over teaching strategy

Another important factor that influenced instructors' teaching strategies was the institutions. Even though the universities and institutes did not play a significant effect on their how they taught or planned their courses. Professors at UASZ, ENSA, and ISFAR simply expressed the institutions mandated all professors to create and distribute a course syllabus to students. ISFAR also organized training and workshops on various teaching and learning techniques for any professors wishing to gain new knowledge, skills, or information on sound pedagogical practices. ENSA also had program that funded professors to travel abroad for conferences, workshops, or trainings allowing professors to gain international exposure to new knowledge and information. However, when asked if they felt pressure from their departments, their faculties, or from the university on how to structure and deliver their courses, all professors felt at liberty to do what they felt was the most appropriate.

Government influence

Professors felt that decisions from the Government, particularly from the Ministry of Education, indirectly affected their course planning and ability to engage in LC approaches. As of 2013, departments at UGB, UASZ, and UCAD no longer determined how many students were accepted into the programs. The Ministry of Education controlled enrollment rates of each department/faculty and as one professors expressed "[...] is a very big challenge [for professors]

in giving lectures to them [students]; it is very difficult because we have... it is very disproportionate to the number of professors by department or by the faculty."

Decisions by the Ministry of Higher Education affected class sizes, the number of available classrooms for students, as well as the available resources for labs and classrooms that often discouraged professors from adapting more LC approaches.

Government also controls how funding is allocated to the institutions as well as how much money student receive in stipends and scholarships. The irregularities of payments often led to outbreaks of student strikes and protests—strikes that affected teaching hours and professors' instructional strategies. At UGB, professors indicated that the primary reason for the frequent and prolonged strikes was due to the delayed scholarships and stipends payments for students, and salaries for professors. The government allocation of financial resources to institutions also meant that institutions are limited in what they can and cannot do. One professor stated his institution needed large financial investments to allow for infrastructural improvements that will create additional teaching and classroom spaces. However, the government is unable to finance such large-scale projects, and institutions are forced to function at overcapacity. In addition, the government also partnered with international institutions (i.e. The World Bank) that would invest resources and information to the schools. Results indicated that government decisions had indirect impacts on whether or not they could engage in LC approaches, and in some cases, determine what types of teaching techniques could be used.

Hierarchical culture of instruction

One of the main themes that emerged in the interview responses was the hierarchical organization of Senegalese instruction. Professors particularly those at UCAD, expressed that there was a clear distinction between the roles of younger, newer professors and the senior

professors with more years of teaching experiences. This gave a more holistic understanding on the instructional culture at Senegalese institutions, and how it might affect teaching practices.

One of the main things noted was that newer professors all served under a much senior professor who took on the role of a mentor. Newer professors were often in charge of the lab and practical work sections while senior professors taught the lecture portion of the courses. Newer professors could not design and deliver their lab/practical-work course curriculum without approval from the senior professors. And so, there were some limitations for newer professors on how and what they taught students. One of the younger professors stated that because senior professors were very well respected within the institution, some of the younger instructors felt intimidated and did not express themselves when it came to changing teaching practices. Although not all senior instructors used traditional methods, many were resistant to changes in teaching practice out of habit—they wanted to continue teaching in the same way they taught before.

Interestingly, most of the pedagogy workshops and trainings provided by the institution were geared to newer professors rather than the older professors. One professor felt that it was because newer professors were more inclined to use traditional practices due to the enormous time constraints, the pressures of teaching large class sizes with multiple sections, and their lack of teaching experience. The younger generation of professors were being encouraged to enroll in PPU as part of the training and professional development on pedagogical practices and consequently, there were far less senior professors attending these pedagogical workshops and trainings.

Constraints in teaching

In both survey and interviews, professors were asked about some current factors or challenges that prevented them from adopting new strategies. Survey data showed that professors

at ENSA and ISFAR felt the primary constraint was the lack of equipment and materials (projectors, microscopes, etc.) to facilitate learning ($n = 10$). Nine reported that electricity outages and poor internet connection was a challenge, and three indicated that the course structure and class schedules were a constraint and 2 reported a lack of pedagogical materials.

At UCAD, UGB, and UASZ, 9 professors stated that the primary constraint in learner-centered methods was a lack of adequate materials and resources to facilitate learning. Eight professors, mostly from UCAD, stated that large class sizes were a big issue in teaching students, although professors from the other two mentioned class sizes as a problem. Professors from both UCAD and UGB expressed that a lack of classrooms for students was limiting factor. Seven professors from all three institutions addressed that the lack of pedagogical material was a constraint in using learner-centered practices.

Like the survey responses, interview participants from all institutions a variety of constraints/obstacles they faced in their current teaching practices, as well as challenges in employing the LC approach. As shown in Table 5, the primary constraints professors faced at UCAD, UASZ, and UGB were overcrowded classrooms, frequent student strikes, and the lack of materials to facilitate teaching and learning strategies. Student strikes were especially problematic because they affected nearly all every aspect of instruction. In Senegal and much of Sub-Saharan Africa, student activism is prevalent due to a variety of reasons that include poor learning environments and conditions, lack of students services, delays in scholarship or stipend payments and much more (Teferra, 2004). In Senegal, government delays in stipend/scholarship payments led to frequent and prolonged strikes that resulted in less in-class time with students. Professors expressed that this not only forced them to rush through the course material, but it was often difficult to plan different activities or use learner-centered methods due to the lack of

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time professors. Professors are unable to give their final evaluations until completing all the course material, extending the academic year into the next. In an attempt to make up for the lost teaching time, professors were forced to teach using lectures and PowerPoint presentations. They stated that it compromised teaching quality and learning for students because it was difficult to plan and reschedule certain class activities like practical work, group-work, and field-trips. Instructors were forced to forgo learner-centered activities beneficial to student learning.

Table 5.

Challenges and constraints in current teaching practice at the five institutions

Institution	Challenges and Constraints	
University of Cheikh Anta Diop (UCAD)	<ul style="list-style-type: none"> • Large class-sizes • Lack of infrastructure (classrooms, lab rooms) • Frequent student strikes • Inadequate time allocated to teaching • Shortage of full-time professors • Lack of teacher and course evaluations 	<ul style="list-style-type: none"> • Inefficient student assessment techniques • Lack of materials and tools to facilitate teaching and learning • Poor internet connection • Few pedagogical workshops and trainings instructional practices
Gaston Berger University (UGB)	<ul style="list-style-type: none"> • Frequent student strikes • Few materials and tools to facilitate teaching • Few field-sites and demonstration plots • Few library resources on agriculture-sciences • Large class-sizes • Shortage of full-time professors 	<ul style="list-style-type: none"> • Lack of student participation during courses • Lack of pedagogical training workshops and seminars • Lack of teaching, lab, and office space • Poor internet connection • Limited funds to purchase materials
Assane Seck University	<ul style="list-style-type: none"> • Frequent student strikes • Lack of materials and equipment to facilitate teaching • Few available classrooms to teach or conduct LC methods 	<ul style="list-style-type: none"> • Large class sizes • Poor internet connection • Lack of teacher evaluations • Tardy or absent professors who do not
National Advanced School for Agriculture (ENSA)	<ul style="list-style-type: none"> • Teaching time • Lack of materials to facilitate teaching and learning • Lack of classrooms (infrastructure is limited) • Lack of transportation to field sites 	<ul style="list-style-type: none"> • Large class sizes • Frequent power outages • Limited funds to buy resources and materials • Shortage of full-time professors
Institute for Advanced Rural and Agricultural Training (ISFAR)	<ul style="list-style-type: none"> • Lack of materials to facilitate teaching and learning • Unmotivated students 	<ul style="list-style-type: none"> • Resistance of students to LC approaches • Lack of available classroom space

Results from both phases of the study revealed that the large student populations were another challenge at UCAD, UASZ, and UGB. . Student enrollment has increased exponentially in the past decade. Instructors from UGB and UCAD expressed that the high student to professor

ratio made it more difficult to teach, mentor, and advise students. Large classes also made interaction and classroom activities much more challenging to execute. As a result, there were limited teaching spaces to accommodate the large classes, creating overcrowded and uncomfortable learning environments. At UASZ, one professor stated that it was often a challenge to find large lecture classes; *“It is a real problem [...] It is a gymnastics to have a class, a small class [...] sometimes you can begin [teaching] a class, and another professor comes to tell you that it is my class. You [have] to go out—to leave. You have to go with your students and leave.”* Large student populations also meant that professors had to take on the additional responsibility of teaching more class and lab sections—a task that was extremely time-consuming. This also created difficulties in evaluating assignments and exams for all the students. Professors at UGB and UCAD explained that it took weeks for final exams to be graded, meaning that the overall student grades are delayed. Large class sizes paired with outdated evaluation methods caused long delays in grading exams; *“Because, for example, I have a large group for example 1,300 students. If I have 1,300 copies to correct and mark... you see how much time that should take (chuckles) [...] It takes too much time! [...] I'm supposed to do it alone. Yeah, by myself only and it takes too much time to do it-- because we are still evaluating in the old way.”*

The lack of lab materials and tools/resources to facilitate teaching and learning was another major challenge. Many felt that it made lab and in-class instruction extremely difficult due to the few materials/tools to facilitate teaching. These included video projectors, speakers to show movies, writing boards for instructors to use, microscopes for the lab and much more. Additionally, there were few agriculture books and resources at the library for students and

professors to use. Educational support in agricultural sciences was not enough, leaving students and professors with limited access to knowledge.

Professors at ISFAR and ENSA felt that there were few, if any, tools to conduct more advanced and technical work. This was especially problematic because students were not receiving the proper training to compete with the international standards. Another challenge at both training institutions was the limited teaching time allocated for the lecture and practical portion of the class. One professor expressed that it was difficult scheduling classes because course were typically 4 hours in duration [and could only be scheduled in the mornings or afternoons]. There were also not enough credit hours dedicated to the lab portion of class, meaning that students were unable to practice their skills. “It would be really good if there was more practice. [...] I find that the credit hours— how do you say it, the credit hours which [are] assigned to the discipline what we teach. But in fact, the number of credit hours dedicated to this field is very, very small. It is insufficient.” Another professor expressed that the course schedule/course catalogue must be revised to include more time for hands-on work into the curriculum. The limited time forced instructors to rush through material, a disadvantage to students because they do not learn. Combined with the lack of practice, students are unable to keep up with the technological and scientific innovations, and are left without the skills needed in the sector.

Professors at UGB, ENSA and ISFAR expressed that there was a lack of transportation (vans and buses) to take students to field sites and research stations. This meant that field-trips were often postponed or cancelled, robbing students of the opportunity to gain hands-on experience in the field. One professor expressed that it was especially problematic for students in soil sciences who needed to be out in the field to truly apply their classroom knowledge.

The shortage of professors was another constraint felt by nearly all the professors, particular at UCAD, UASZ, and UGB. Most professors stated that they taught more hours and had more students due in an effort to teach the growing student population. Vacataire professors were hired to make up for the shortage of instructors, but the limited financial resources made it difficult for some departments to hire them.

Other constraints mentioned included poor internet connection at the schools and frequent power outages that disrupted the teaching process. The poor internet connection made it difficult for professors to use the web as a resource and conduct general functions of teaching that require internet. Professors at UGB stated that the shortage of spaces meant that many professors shared office spaces, which becomes problematic when conducting office hours or talking to students. *We don't have space—you see this office? [Indicating to the office space] We are three in this office for example [...] when you receive a student, you cannot work very well. Because if I receive one [student], and my colleague receives one, the other colleague receives... sometimes it is difficult."*

Professors at UASZ, UCAD, ISFAR, and UGB stated that there were no systems in place for professors to receive student feedback/evaluation on their teaching. At UCAD, professors addressed the importance of teacher-evaluations, stating that a primary challenge in instructional practice was that instructors had no way of knowing if their methods were sound due to the lack of accountability systems in place for professors. Without any feedback or follow-up systems, professors have few ways of knowing what methods are effective versus those that are not, as well as what methods students enjoy and what changes must be made to teaching to ensure that they are learning.

Nearly all interviewed professors from expressed that there were difficulties in using the learner-centered and innovative teaching methods. Many believed that higher level students (mostly those at the Masters level) found it easier to engage in LC practices than students in the first and second years. Another challenge addressed by professors at UCAD, UASZ, and UGB was that LC practices were easier in smaller rather the large lecture courses. Smaller classes gave students more opportunities to interact with each other, complete in-class activities, engage during the practical portion of class, and engage in activities considered to be LC.

Another limitation to this approach was reluctance from instructors to change their current teaching practice. This was primarily due to the fact that LC methods directly contradicted the traditional teaching practices in Senegalese instruction. One professor also expressed instructors may resist embracing such methods because they felt that LC approaches threatened the traditional classroom environment and power balance. Other professors felt that students may also resist or have difficulties embracing the LC approach because it gives them too much responsibility over their learning process. Students under the TC approach simply memorize information and take an exam. However, this LC approach calls for more involvement and engagement in and out of class and students may not be accustomed to.

Another challenge in the approach was that preparation, design, and implementation of learner-centered material was time-intensive. This is especially problematic for professors at UGB, UCAD, ENSA and UASZ that have shortened teaching hours due to the existing constraints (course scheduling, strikes, etc.) present at their institutions. Professors expressed that instructors were less likely to incorporate techniques that took up additional time, and would rather continue using more traditional teaching practices to teach students.

Discussion and conclusion

Findings from the survey and interviews identified that professors were incorporating some LC methods in their courses and were interested in using more methods. The main teaching tool at all institutions was lectures/PowerPoint presentations however, data also showed that professors used a variety of other teaching techniques in their classrooms to accommodate different learning styles and keep their students interested in the course. Hands-on activities, visual aids, discussions, and group activities were practices nearly all professors used in their courses.

There were some key constraints preventing professors from adapting learner-centered approaches in their classrooms. The primary constraints included lack of materials/equipment to facilitate teaching and learning, a weak technological infrastructure, and the lack of pedagogical materials to support the new teaching methods that included learner-centered approaches. Professors also felt that the high student-teacher ratio and few classrooms prevented them from moving forward with more innovative teaching techniques.

However, there were discrepancies between the pedagogical techniques currently being employed versus techniques thought to be the most effective. Professors that had some training in learner-centered methods agreed that there were more approaches to teaching rather than lectures/PowerPoint presentations yet nearly all still used this method in their classrooms. This again was because they lacked the materials to facilitate such methods, or faced other constraints such as overcrowding in classrooms, lack of in-class time to incorporate new methods, or inadequate teaching spaces (small classrooms).

One reason for this finding was the way professors' defined learner vs. teacher-centered approaches. Some professors expressed concerns that they were unable to distinguish between

the two methods. Others felt that the teacher-centered approach incorporated most, if not all the components of learner-centered methods, because learning continued to be the main priority in the teacher-centered methods. A few others articulated that they understood the value in the learner-centered approaches, but had doubts in successfully implementing them due to the culture of instruction in Senegal. Low perceived confidence in successfully engaging in the behavior and the societal norms decreased their intentions to use these methods. They did not feel that they could confidently use these methods well with their students, discouraging them from engaging in the actual behavior. Because Senegalese, like much of Sub-Saharan instructional practice was grounded in traditional teaching practices (societal norm), instructors felt that more traditional methods were the best (Sikoyo, 2010).

Another explanation of the discrepancies may stem from the daily constraints and obstacles professors face. In response to whether he/she would change the current teaching practices given the appropriate resources, one professor replied that he/she would simply improve current methods to make them more efficient, but only if the constraints on professors abated. It is clear that the challenges they face in teaching are a contributing factor in whether they are willing and able to switch to more learner-centered approaches.

This study also supports Ajzen's (1991) theoretical framework in showing how an individual's intentions to perform a certain behavior are influenced by their attitude toward a behavior, the social norms, and perceived confidence in engaging in a behavior. The participating professors indicated positive attitudes towards engaging in learner-centered methods and felt little to no pressure by their peers, administrations, or institutions in engaging in other teaching techniques. However, professors reported that their institutions provided few (if any) resources for using learner-centered teaching and over half ($n = 32$) felt that their

Results revealed that challenges in teaching played had the largest contributing factor in whether or not instructors were able to engage in more LC approaches. Higher education in Africa faces a variety of challenges that range from limited access to the institutions, a strict and structured curriculum that leaves little room for teaching agency, student activism, and much more (Teferra, 2004). Findings showed that some of the major challenges included student strikes, overcrowded classrooms, inadequate teaching spaces, and the lack of materials to incorporate new and different teaching techniques all of which determined whether they could effectively engage in LC approaches.

Second, professors were more likely to engage in LC approached if there were positive influences supporting and encouraging new teaching strategies. Professors felt that intentional partnerships with institutions such as ERA, and pedagogical support and training had the largest positive influence in their teaching strategy. However, ERA and the Ecole Normale Superiure were the only two that explicitly discussed the learner-centered approach. Professors that received training in LC approaches stated that they attempted to incorporate them in their current teaching practice. Interestingly enough, one professor showed that despite having a background in effective teaching strategy and the LC approach, many professors preferred using traditional methods. Traditional approaches are favored they require very little preparation and execution time, unlike the LC approach. It revealed that the environment and peers to some effect influence the teachers design and deliver their courses. It also showed that regular professional development is helpful in encouraging professors to adapt and continue using new teaching strategies. If there are no resources to support instructors in improving their methods, it is easy to revert back to more traditional teaching approaches. Most professors felt comfortable talking to their peers on new teaching approaches and felt that instructors were engaging in conversation on

pedagogical techniques. Professors at the UCAD, UGB, and UASZ felt that the government's delays in the allocation of funds to the institution and the delayed salary and scholarship payments affected to some degree, whether they were able to use more LC approaches in the classrooms. It was mainly because they were limited on in class time.

Lastly, professors had positive attitudes and perceptions on the learner-centered approach. A few professors still indicated that they were unclear about the distinctions between the two approaches, and felt that TC methods could still include LC components. They all defined LC methods as those that included the students' needs, interests, and abilities in the course design process.

Senegalese instructional culture, especially at UCAD, was very hierarchical with senior professors having a strong influence over the newer, younger professors' teaching. Newer professors also received more training in teaching approaches than senior counterparts. Senior professors also felt less inclined to change their teaching approaches. However, professors expressed that it was newer and less experienced professors who were more likely to engage in traditional teaching strategies due to teaching pressures (lack of time, too many students, etc.).

This changing the culture of instruction to more learner-centered approaches requires addressing the three main components of the framework: a positive shift in professors' attitudes toward using new teaching approaching, addressing the challenges in instruction that professors experience, an understanding of the social norms prevalent at the institutions; understanding all the major influences that impact their teaching practices.

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CHAPTER FIVE: CHANGING TO LEARNER-CENTERED APPROACHES

Introduction

Higher education in agriculture plays an especially important role in spreading development in African nations. Agriculture education in particular continues to fall short, and there needs to be dramatic investments in improving the quality of higher education (Bravo-Ureta, Maas, Diouf, & Ndoeye, 2012). In fact, studies show that investing in education not only improves the human capital in a nation, but has the potential to increase a nation's overall productivity and capacity in of citizens. One of the main concerns the USAID-ERA project attempted to address was create a more skilled workforce in the agriculture sector by improving agriculture curricula and the curricula-delivery methods in place (USAID, 2011; Bravo-Ureta et al, 2012). This was especially important because students entering the workforce were not prepared or trained with the "soft-skills" needed in the professional sector: skills that include critical thinking, problem-solving, communication, decision-making skills, etc. (Tech, 2013; Bravo-Ureta et al., 2012).

One of the main concerns the USAID-ERA project attempted to address was providing trainings for professors to improve the curricula and the curricula-delivery methods in Senegalese higher education institutions (USAID, 2011). Weimer (2002) stated that students today enter higher-education with very few of the basic skills needed to succeed in the professional environment and instead focus on gaining knowledge to find a career. They often lack the confidence in themselves as learners and are dependent on the teachers to make the learning decisions (Weimer, 2002). Traditional teacher-centered (TC) approaches prevalent in many classrooms today, including Senegal limit student participation and involvement in the learning process, resulting in under-performing students who do not develop higher order skills

(Dembélé, & Miaro-II, 2003; UNESCO, 2005). Therefore, immediate changes must be made in shifting content-delivery method to becoming more learner-centered. Results from the 2-part study conducted on Senegalese professors at 5 higher-education institutions revealed that professors had positive perceptions and attitudes toward the new approach. In fact, they were engaging in some learner-centered (LC) practices within their own classrooms. There were certain factors that influenced their teaching practice and whether they would engage in LC behavior, the most important one being partnerships with international organizations. However, the limitations they faced in current teaching practice prevented them from engaging in more LC practices. This chapter will explore ways in which professors can mitigate these factors to incorporate more LC approaches, as well as understanding how international partnerships can facilitate in providing more pedagogical support and training. It will provide a few set of recommendations for implementing more LC approaches in Senegalese classrooms.

Recommendations

International partnerships

Professors at the five institutions all felt that the presence of international organizations was influential in their teaching practices. One of the primary factors preventing instructors from engaging in LC methods were the challenges presented in their learning environments. In virtually all schools, instructors expressed a number of direct and indirect factors limiting them from engaging in more LC behaviors: factors that included lack of physical infrastructure to engage in LC practices, the lack of resources and information pertaining to the new approach, and uncontrolled factors such as student strikes that played a significant role in their teaching

practices. The presented challenges not only affected their ability in engaging in LC behavior, but it also greatly influenced their perceived confidence in effectively performing them.

According to the Ajzen's (1991) Theory of Planned Behavior, an individual's perceived behavioral control is the biggest determinant in actual behavioral control. If professors had fewer factors that hindered performance of LC behavior, and increased self-efficacy in using the methods correctly, there is a higher likelihood that LC behavior will be performed. And so the question remains—how can one mitigate these challenges, and can international partnerships like USAID-ERA and others facilitate this process of change?

International aid agencies have contributed in the diffusion of more learner-centered and student-centered approaches, by providing financial resources, support, and extensive trainings that include follow-ups, evaluations and support on the LC approach to push instructors toward these new approaches (Altinyelken, 2010; Dembélé, & Miaro-II 2003,). Results from the study showed some professors reverted back to traditional teaching practices even after receiving adequate teacher-training in LC approaches from the Ecole Normale Supérieure. International agencies like USAID-ERA are instrumental in providing the necessary tools and support needed to improve pedagogical practice. Ongoing professional support facilitated by these institutions can become a scaffold for the change needed to transform teaching practice to becoming more learner-centered.

One of the study's major findings indicated that organizations such as USAID-ERA provided support in the form of trainings and material resources. Professors were eager to engage in LC approaches and practices but were limited by material resources as well as a lack of expertise in innovative teaching techniques. Simply providing short-term technical trainings may not be enough to help promote LC behaviors. Altinyelken (2010) states that pedagogical

trainings are often inadequate because trainings are rushed and overloaded with information, leaving instructors without time to process the new information or find value in it. If organizations such as ERA can work in collaboration with these support systems, support when necessary that encourages long-term sustainability rather than meeting short-term results, then pedagogical renewal for Senegalese instructors is possible. This means providing knowledge, encouraging partnerships with interactions universities and institutions to facilitate knowledge transfer, serve as a platform where institutions meet with government officials and other organizations working toward the same goals. International agencies should not be charged with full responsibility of designing and creating trainings in pedagogical practice or attempting to mitigate all the challenges instructors face (Dembélé & Miaro-II, 2003). Instead, they should first work directly with the specialists at the new pedagogical institutions at UCAD and UGB to provide them with the support and expertise needed to continue training instructors. Second, they must work toward connecting collaborative networks and partnerships with other institutions and organizations in which both parties benefit and exchange with each other. Partnerships with Senegalese institutions and others abroad must be collaborative so that both parties benefit from. For example, Senegalese instructors wishing to learn about pedagogical practice learn from international institutions and experts, and in exchange international programs can create study abroad programs for students. This can therefore create lasting projects in which instructors can continue long after programs like USAID-ERA are finished.

Methods of incorporating LC methods

The study's findings also recommend understanding the cultural context and climate of Senegalese education prior to developing learner-centered pedagogical trainings. Professors that participated in the study revealed that they felt at ease changing their methods from TC to LC

practices. However, there were indications that the hierarchical structure of Senegalese instruction, particularly at UCAD made it more difficult for the newer, inexperienced professors to change their teaching practice without approval from the more senior-level instructors. Senior-level professors served with more teaching experience served primarily as mentors to their less experienced counterparts. Findings revealed that many of the pedagogical trainings in Senegal were focused on the more inexperienced professors, yet it was more experienced professors that were more likely to engage in traditional teaching practices. This is because instructional practices are deeply embedded in teaching culture, experience, and practice (Dembélé & Miaro-II, 2003).

If pedagogical trainings, support, and resources are designed to cater to more experienced professors, there is a higher chance of encouraging their inexperienced mentees to adapt to more LC approaches and integrate it into their current teaching practice. As the Theory of Planned Behavior indicates, more positive social norms surrounding LC practices can result in overall higher intentions in engaging in a behavior (Ajzen, 1991). Therefore, if more senior professors engage in more LC behavior, there is a higher likelihood that their newer counterparts would engage in LC practices.

Mitigating the challenges in LC approach

One of primary factors that discouraged professors from incorporating more LC approaches were the constraints they faced in current teaching. Many indicated that despite having positive attitudes and perceptions, and subjective norms that encouraged behavioral control, there were many factors preventing their performance in engaging in innovative teaching practices. However, for LC pedagogical practices to be implemented effectively and correctly, the culture, environment, and needs must be taken into account (Tabulawa, 2003).

Contrary to common belief about the LC approach, incorporating these methods does not require additional resources or tools, but can include alternative approaches that account for some of the challenges in teaching practice. Schweisfurth (2011) states that one of the main barriers in changing teaching practices is ensuring that LC pedagogy is understood in different contexts rather than in more “Westernized” construct of teaching. Training and pedagogical support given to instructors must be appropriate to the needs of the instructional culture of Senegal as well as the needs of each individual institution.

Additionally, alternative approaches considered to be LC can be used in different classrooms. Discussions, asking students questions, case-based studies may work better in larger classrooms rather than showing films and movies. Anecdotes and using cell-phones apps may also be alternative LC approaches that instructors can consider.

Conclusion

The learner-centered approach, although new shows promise in Senegal. This study’s findings indicate that professors are not only willing to use these methods, but are actively involved in knowing about new teaching techniques. International partnerships are crucial in supporting professors in Senegal, but it is also important to consider the cultural context of instructional practices, as well as the needs and challenges professors face in their current teaching practice.

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Jossey Bass Ltd.

APPENDICES
APPENDIX A: IRB Approval Letter for Survey-Questionnaire



Office of Research Compliance
Institutional Review Board
North End Center, Suite 4120, Virginia Tech
300 Turner Street NW
Blacksburg, Virginia 24061
540/231-4606 Fax 540/231-0959
email irb@vt.edu
website <http://www.irb.vt.edu>

MEMORANDUM

DATE: July 21, 2014
TO: A. Ozzie Abaye, Wangui C Gichane, Patrick Trail, James C Anderson II, Donna Westfall-Rudd
FROM: Virginia Tech Institutional Review Board (FWA00000572, expires April 25, 2018)
PROTOCOL TITLE: Need Assessment for Faculty Development Program in Senegal & Teacher Education Matters
IRB NUMBER: 14-726

Effective July 21, 2014, the Virginia Tech Institutional Review Board (IRB) Chair, David M Moore, approved the New Application request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Exempt, under 45 CFR 46.110 category(ies) 2**
Protocol Approval Date: **July 21, 2014**
Protocol Expiration Date: **N/A**
Continuing Review Due Date*: **N/A**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

APPENDIX B: Survey-Questionnaire for Professors

SECTION 1: Identity and Demographic Background

1. Please rank the following nouns that identify you in order from 1- DESCRIBES YOU BEST to 4-DESCRIBES YOU LEAST

Scientist _____
Teacher _____
Mentor _____
Administrator _____

2. Please rank the amount of time you spend doing the tasks in order from 1-MOST AMOUNT OF TIME to 4 - LEAST AMOUNT OF TIME

Time spent being a scientist _____
Time spent being a teacher _____
Time spent being a mentor _____
Time spent being an administrator _____

3. Please rank the amount of time you would prefer to spend on the following in order from 1-STRONG PREFERENCE to 4- NO PREFERENCE

Time being a scientist _____
Time being a teacher _____
Time being a mentor _____
Time being an administrator _____

4. What level do you teach? (mark all that apply)

Baccalaureate _____
Licensee _____
Master's Degree _____
Doctorate _____

5. How long have you been teaching? _____ years

6. Are you ___ Male ___ Female

7. What is your average class size? _____ students

8. What courses are you currently teaching? (List all)

SECTION 2: Teaching and Learning Strategies

1. Please indicate what teaching tools you use to accommodate differences in learning styles

PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

TEACHING TOOLS	YES	NO
PowerPoint Presentation		
Charts/graphs/maps		
Using bold colors		
Discussions		
Hands-on activities		
Field-trip		
Audio lectures		
Oral summaries by students after each lecture		
Oral summaries by yourself after each lecture		
Role-play scenarios		
Multi-media presentation		

1. What techniques do you currently employ to evaluate student current knowledge of the course content? (for example: multiple choice exams, short and long answer examinations, writing reports or papers, completing group projects and assignments.
2. How often do you question your students during each **lecture**?
 Never ____
 1-2 times a lecture _____
 3-5 times a lecture _____
 5+ times a lecture _____
3. How often do you allow students to use prior knowledge in their assignments, activities and projects?
 Never _____
 1-10 times per module _____
 10-20 times per module _____
 20+ times per module _____

PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

4. How often do you allow students to work together (for example: group activities, group work, group projects)?

Never _____
1-10 times per module _____
10-20 times per module _____
20+ times per module _____

5. How often do you require your students to recall information during or after lecture?

Never _____
1-10 times per module _____
10-20 times per module _____
20+ times per module _____

6. How often do you allow students to explain lecture material in their own words?

Never _____
1-10 times per module _____
10-20 times per module _____
20+ times per module _____

7. How often do you allow students to apply concepts they learn in the classroom to their assignments and assessments?

Never _____
1-10 times per module _____
10-20 times per module _____
20+ times per module _____

8. How often do you allow students to break down class content and analyze relationships between what they are learning to other outside experiences?

Never _____
1-10 times per module _____
10-20 times per module _____
20+ times per module _____

9. How often do you allow your students to construct, develop, and create experiments and/or projects that involve taking apart concepts learned inside the classroom and synthesizing it with old and new knowledge?

Never _____
1-10 times per module _____
10-20 times per module _____
20+ times per module _____

10. How often do you allow your students to present and defend their opinions by making judgments about information and knowledge you provided them?

PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

Never _____
 1-10 times per module _____
 10-20 times per module _____
 20+ times per module _____

11. How often are students evaluated in your course?

Never _____
 1-3 times per module _____
 3-5 times per module _____
 5+ times per module _____

12. How do you test your students? List all that apply (for example: multiple choice exams, short and long answer exams, written reports or papers, group assignments, projects, etc.)

13. What do you do to determine students' current knowledge in a subject at the beginning of a course?

14. For the following section below, please indicate if you use the following pedagogical techniques. If marked YES, please describe how you facilitate the techniques in the classroom?

PEDAGOGICAL TECHNIQUES	YES	NO	HOW DO YOU FACILITATE TECHNIQUES IN CLASSROOM?
Group problem solving			
Problem-based learning			
Discussions			
Case-based strategies			
Role-playing			
Coaching or mentoring			
Lecturing or teacher directed activities			
Other			

PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

15. Which of the above pedagogical techniques do you find to be most effective in your classrooms? (List all that apply)
16. What are some techniques to you employ to stimulate the learning process? (List all that apply)
17. Approximately how many hours a WEEK do you dedicate to teaching?
18. Approximately how much time do you spend preparing your lesson plans in a WEEK?
19. What are some constraints (limits or restrictions) in your teaching strategies that affect teaching and learning? List all.
20. Given proper resources and teacher training & support, would you make a marked shift to improve the gaps in teacher strategies?

Please indicate your level of agreement with the statements below about your institution on a scale from 1-GOOD to 5-BAD

21. Employing different teaching techniques to teach students would be
Good 1 2 3 4 5 Bad
22. Collaborating with other faculty members at my department and institution would be
Good 1 2 3 4 5 Bad
23. Given the necessary training and support, using different teaching and learning styles in my course would be
Good 1 2 3 4 5 Bad
24. Allowing students to take control and responsibility for their learning would be
Good 1 2 3 4 5 Bad
25. Shifting from teacher-centered teaching to learner-centered instruction would be
Good 1 2 3 4 5 Bad
26. Changing the way agriculture is taught in this institution would be
Good 1 2 3 4 5 Bad
27. Including more learner-centered teaching strategies in my classrooms would be
Good 1 2 3 4 5 Bad
28. Requiring mandatory teacher-training workshops to all faculty members at my institution would be
Good 1 2 3 4 5 Bad

SECTION 3: Subjective Norms

PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

Please indicate your level of agreement with the statements below about your institution on a scale from 1- STRONGLY AGREE to 5- STRONGLY DISAGREE

1. My university is a good place to work
Strongly agree 1 2 3 4 5 Strongly disagree
2. I am treated with respect at my university
Strongly agree 1 2 3 4 5 Strongly disagree
3. I have the opportunity to collaborate with colleagues and faculty at my university who share my interest
Strongly agree 1 2 3 4 5 Strongly disagree
4. My university welcomes free and open input from faculty members
Strongly agree 1 2 3 4 5 Strongly disagree
5. My administration's approval of my teaching strategies is important to me
Strongly agree 1 2 3 4 5 Strongly disagree
6. My university supports efforts from faculty to develop learner-centered teaching strategies
Strongly agree 1 2 3 4 5 Strongly disagree
7. My administration provides faculty with resources for developing learner-centered teaching strategies
Strongly agree 1 2 3 4 5 Strongly disagree
8. My administration discusses innovative teaching strategies
Strongly agree 1 2 3 4 5 Strongly disagree
9. I am treated with respect by other members in my administration
Strongly agree 1 2 3 4 5 Strongly disagree
10. I feel pressure from other faculty members to change my teaching strategies
Strongly agree 1 2 3 4 5 Strongly disagree
11. I feel free to express my opinions about my teaching strategies without worrying about the negative results from faculty members
Strongly agree 1 2 3 4 5 Strongly disagree
12. I feel free to express my opinions about my teaching strategies without worrying about the negative results from my administration
Strongly agree 1 2 3 4 5 Strongly disagree

SECTION 4: Perceived Behavioral Control

PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

Please indicate your level of agreement with the statements below on a scale from 1- STRONGLY DISAGREE to 5- STRONGLY AGREE

1. I am confident that I can incorporate more learner-centered strategies of teaching in my curriculum

Strongly disagree 1 2 3 4 5 Strongly agree

2. I know enough about learner centered-teaching techniques to implement them in my own curriculum

Strongly disagree 1 2 3 4 5 Strongly agree

3. I am currently doing an excellent job implementing learner-centered techniques in my teaching

Strongly disagree 1 2 3 4 5 Strongly agree

4. The decision to use different teaching and learning styles is out of my control

Strongly disagree 1 2 3 4 5 Strongly agree

5. Designing my teaching/learning techniques is entirely up to me

Strongly disagree 1 2 3 4 5 Strongly agree

6. My institution makes it easy for me to use other teaching styles

Strongly disagree 1 2 3 4 5 Strongly agree

7. I feel free to express my opinions about teaching styles in my administration without worrying about negative consequences

Strongly disagree 1 2 3 4 5 Strongly agree

APPENDIX C: Survey Questionnaire Consent Form

Need Assessment for Faculty Development Program in Senegal –
Survey Consent Form

Dear Sir/Madam:

The survey questionnaire in which you are about to participate in will ask you to answer questions about your teaching and learning strategies, your institutional environment, your attitudes toward your teaching strategies, and how confident you feel in your teaching strategies . The purpose of this research study is to understand the gaps in teaching and learning strategies by exploring the factors that might affect professors’ behaviors in agriculture programs. By understanding and identifying these gaps in teaching and learning strategies, we hope to design faculty training modules that address these key challenges and better prepare teachers to teach agriculture.

The survey will take about an hour to complete and your responses will be confidential. We will ask you to provide us your name, but only to link your responses to the survey questionnaire. We will not ask you to provide any further personal information such as your address, telephone number, email address, etc.

Your confidentiality is our priority and all data will be stored and protected in a secured environment. The results of this study will be used for research and scholarly purposes only. They will not be shared with anyone not affiliated with the Education and Research in Agriculture (ERA) program or the Virginia Tech representatives.

Participation in this study is voluntary and you are free to decline to participate. If you decide NOT to participate in this survey, you may withdraw at any time. Your answers and any data collected will be destroyed and will not be used.

If you have any questions about your participation in the research study, please contact **Wangui Gichane** - wangicha@vt.edu

By signing below, you have:

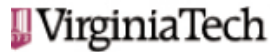
1. Agreed to reading the information above and,
2. Consent to voluntarily participate in the survey

NAME (PLEASE PRINT): _____

SIGNATURE: _____

Thank you

APPENDIX D: IRB Approval Letter Interviews



Office of Research Compliance
Institutional Review Board
North End Center, Suite 4120, Virginia Tech
300 Turner Street NW
Blacksburg, Virginia 24061
540/231-4606 Fax 540/231-0959
email irb@vt.edu
website <http://www.irb.vt.edu>

MEMORANDUM

DATE: June 9, 2015
TO: A. Ozzie Abaye, Wangui C Gichane, James C Anderson II, Thomas Greig Archibald
FROM: Virginia Tech Institutional Review Board (FWA00000572, expires April 25, 2018)
PROTOCOL TITLE: Need Assessment for Faculty Development Program in Senegal & Teacher Education Matters
IRB NUMBER: 15-604

Effective June 9, 2015, the Virginia Tech Institution Review Board (IRB) Chair, David M Moore, approved the New Application request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Expedited, under 45 CFR 46.110 category(ies) 5,6,7**
Protocol Approval Date: **June 9, 2015**
Protocol Expiration Date: **June 8, 2016**
Continuing Review Due Date*: **May 25, 2016**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

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PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

IRB Number 15-604

page 2 of 2

Virginia Tech Institutional Review Board

Date*	OSP Number	Sponsor	Grant Comparison Conducted?
06/04/2015		US Agency International Development	Compared on 06/09/2015

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

APPENDIX E: Interview Questions for Professors

Section A: Demographic Information:

- 1) Can you please tell me a little bit about the courses that you are currently teaching? (what subjects, how long do you teach, average class size)
- 2) Please tell me a little bit about your history as a professor.
Things to think about:
 - ✓ When did you begin to teach?
 - ✓ How long have you been an instructor at this institution?
 - ✓ How many universities have you taught in?
 - ✓ Have you taught in any universities outside of Senegal?
 - ✓ What other responsibilities do you have at this institution besides teaching? (e.g., research, advising, administrative)
- 3) Please tell me about your educational background that prepared you for your current position.
Things to think about:
 - ✓ Where did you complete your education?
 - ✓ Did you attend any teacher training?
 - ✓ Tell me a little bit about the methods that were used in your classes? Did any of the methods stand out or which ones do you believe were most/least beneficial?
- 4) Please describe to me in your own words what teacher-centered methods of teaching mean to you.
- 5) Please describe to me in your own words what learner-centered methods of teaching mean to you.
- 6) Do you use LC methods in your course(s)? If yes:
 - ✓ How often during a class period do you use LC practices?
 - ✓ Were there instances that stood out for you?
 - ✓ Were there any obstacles/challenges that you came across?
 - ✓ Would you continue using this method in your course(s)? Why or why not?
- 7) Have you received any training on learner-centered methods? If so, how many times? For how long? By what institution/organization?

Section B: Attitudes Toward Teaching Behaviors

- 1) Please describe to me how you prepare for the course(s) you teach. How do you prepare your lesson plan, syllabus, assessments?
- 2) What are your expectations of the students?
- 3) How do you assess student learning in your course(s)?

PERCEPTIONS AND ATTITUDES OF LEARNER-CENTERED STRATEGIES

4) Describe to me a typical teaching day for a class that best represents your teaching style.

Things to think about:

- ✓ What is the name of the class?
- ✓ What specifically do you do to facilitate learning? (i.e., behavior and duration)
- ✓ What are your students typically doing during the class?

5) What are some practices that you have found to be the most effective in facilitating learning?

6) Are there any practices that you have found to be the least effective in facilitating learning?

7) What do the students expect from you as the instructor?

8) What are some obstacles/challenges that you currently face in teaching your students?

9) What do you feel are some advantages (disadvantages) to using learner-centered methods?

Section C: Subjective Norms and Behavioral Controls

1) What influences the way that you teach?

Things to consider:

- ✓ Do your peers influence the way you teach/plan your course? Can you describe to me how they do so?
- ✓ How is your teaching style similar to other professors in your department?
- ✓ How is your teaching style different from other professors in your department?
- ✓ Does your institution influence the way you teach/plan your course? Can you describe to me how they do so?
- ✓ What support systems are currently in place that help or encourage you to try new teaching strategies?
- ✓ Are there any obstacles/challenges not previously mentioned that you currently face that limit the way you teach/plan your course?
- ✓ Are there other factors that may help you in implementing learner-centered methods in your course(s)?
- ✓ How comfortable do you feel discussing new teaching and learning methods with your peers? With your administrators?
- ✓ Do you feel that it is easy to change your teaching practices at your institution?
- ✓ Is there a lot of discussion about innovative teaching practices in your department/administration? Among your peers?

APPENDIX F: Interview Consent Form

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
Need Assessment for Faculty Development Program in Senegal
Interview Consent Form

Dear Sir/Madam:

The interview in which you are about to participate in will be ask you to describe your experiences as a professor in your current institution, teaching environment, teaching behaviors, and your attitudes toward your teaching methods.

The purposes of this research study are to assess professors' needs for employing learner-centered methods, and identify challenges professors' face in their current teaching and learning methods. By understanding these needs and challenges, we hope to create a set of recommendations that address these challenges and increase the literature on Senegalese teaching practices.

The interview will take about an hour to complete. The interview will be audio-recorded and later transcribed by me. Your identity or any individuals you mention will be kept confidential at all times and will be known to only the investigators. During the transcription, pseudonyms (false names) will be used for your name and those that you mention during the interview. Any additional details in the interview that could potentially identify you or anyone you mention will be altered during the transcription process. The audio-recording, notes, and forms will be stored and protected in a secure environment.

I will ask you to provide us your name, but only to consent to participating in the interview. I will not ask you to provide any further personal information such as your address, telephone number, email address, etc. The information collected during this interview will be used for research and scholarly purposes only.

Participation in this interview is voluntary and your refusal to participate will involve no penalty. You are free to withdraw at any time. If you choose to withdraw from study, any information, responses, and data that you provided will be destroyed and will not be used. Should you have any questions about this study or the interview, please contact me at Wangui Gichane – wangicha@vt.edu

By signing below, you have:

1. Agreed to reading the information above and,
2. Consent to voluntarily participate in the interview

Signature

Date _____

Printed Name

Should you have any questions or concerns about the study's conduct or your rights as a research subject, or need to report a research-related injury or event, you may contact the Virginia Tech Institutional Review Board (IRB) chair, Dr. David M. Moore at moored@vt.edu.

APPENDIX G: Teaching beliefs in the classroom

Instructors' role in the classroom

One of the themes that emerged through the interviews was the shared beliefs professors had about their teaching roles. One professor at UGB expressed that an instructor's role in the classroom was to guide students to becoming more self-regulated learners. An instructor provides the knowledge and skills, while also encouraging students to become independent thinkers who are in control of their learning process. At UGB, professors expressed that an instructors' primary role was to encourage students to learn not just during the class, but outside the classroom environment. One explained that a challenge in teaching is that students entering higher level courses often do not retain the essential information from prior courses. Professors take on an active teaching role and encourage students to learn independently and continue even when the course is finished. Another also noted that an instructor must try to empower students to become confident and independent learners. This means creating courses that encourage continuous participation, discussion question, and critical-thinking activities that fosters independent thinking and the ability to speak up and become confident individuals.

Role of students in the classroom

Through conversations and interviews responses, professors at ENSA expressed some beliefs about students' roles in the classroom as well as some techniques students liked and disliked. Many expressed that students really enjoyed being exposed to new teaching techniques, particularly the syllabus, and those methods that encouraged interaction and active learning i.e. discussions, group-work, student presentations, etc. Students also wanted to be involved in the learning process and to feel motivated by the instructor and the course material to continue learning. Students disliked approaches that gave too much work such as too many reports, lectures, etc. or any teaching techniques that limited or restricted opportunities for classroom interaction. In fact, many students now hold instructors accountable and expected to have some interactive activities and methods incorporated into their curricula.

Beliefs about teaching

Interview and some survey responses revealed some beliefs instructors had about teaching and learning. Most felt at ease changing their teaching strategy. One professor stated that changing teaching strategies was difficult for professors because many required some form of training on new and alternative teaching approaches. He believed that instructors were moving forward with new approaches given the trainings, support, and ongoing discussion on improving pedagogy from the institution and ERA. In fact, one professor advocated that all teacher-trainings should focus on student and learner-centered methods. Another shared belief was that instructors were free to plan and design their courses based on their abilities, style, and the level of training they received. On top of providing knowledge, one professor expressed that he believed instruction should be designed to instill important life and professional skills in students. To do so, instructors must continue to improve and update their course material to adapt to domestic and international standards.