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Sources of complexity in participatory curriculum development: an activity system and stakeholder analysis approach to the analyses of tensions and contradictions

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Abstract The purpose of this article is to contribute to a better understanding of the nature of participatory curriculum development in higher education institutions. We conducted a longitudinal case study that scrutinized an international participatory curriculum development process. Our research spanned six universities across four countries in Africa. We used cultural-historical activity theory as a theoretical lens to identify the critical tensions underlying the curriculum development activity. Six primary contradictions and four secondary contradictions were identified. These tensions were mainly rooted in issues concerning stakeholder relations, rule rigidity, and resource availability. We integrate a stakeholder perspective and discuss how practitioners who seek to design and implement effective participatory curriculum development processes can benefit from applying a combination of activity system and stakeholder analyses during planning as well as implementation stages.

Keywords Participatory curriculum development · Cultural-historical activity theory · Contradictions · Stakeholder analysis · Africa

Introduction

After several decades where international agencies and national policy makers paid scant attention to higher education in developing countries, higher education systems have entered the international policy agenda again (Teferra and Altbach 2004). This is partly due to the need to transform educational systems from products of the industrial revolution and post-colonial

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politics to an engine in contemporary knowledge-based societies (Wolhuter and Wiseman 2013; World Bank 2000). Policy-makers, educators, and the general public in Africa's emerging economies sense a growing awareness about the importance of adopting inclusive curriculum reform initiatives to support this transformation among policy-makers, educators, and the general public (AU 2006; UNESCO 1998).

A participatory approach to curriculum development and reform provides both opportunities and challenges. The expectation is that multi-stakeholder interaction generated by participatory activities can result in the discovery of more sustainable and relevant solutions to contemporary educational challenges. However, the management of curriculum development programs and processes becomes complex when various partners are engaged (McKeown et al. 2006). In general, curriculum change is a multidimensional and multidisciplinary affair that involves a certain amount of associated chaos, such as breakdowns, conflicts, or misfits, and these reform activities require a thorough understanding of the processes that affect curriculum development (Johnson 2001). These tensions and contradictions often result in unintended consequences, especially when they are not carefully analyzed and understood. In this light, the relative lack of debate and attention paid to curriculum issues is problematic (Barnett and Coate 2005). Most especially, there is a lack of insight into the dynamics of curriculum reform and its implementation in the context of higher education systems in developing countries (Altinyelken 2010).

While researchers, educators, and higher education decision-makers acknowledge the role of the wider society in curriculum development and the importance of considering stakeholder perspectives (e.g., Casablancas-Segura and Llonch 2016; Jongbloed et al. 2008; Wiseman and Wolhuter 2013), the scientific literature is scant when it comes to explicitly discussing participatory approaches to curriculum change. There is an established literature strand on "collaborative curriculum development," which refers to a practice where teachers and subject experts collaborate to develop new curricula (Deketelaere and Kelchtermans 1996; Oliver and Hyun 2011); in this paper, we expand this perspective. We address the phenomenon of "participatory curriculum development" (PCD), defined as processes that include a broader range of stakeholders that brings together teachers, subject experts, and education planners, as well as students, public and private employers, and policy-makers. This broader type of participatory process seems to be relatively scantily addressed in the higher education management literature. An exception is found within development-oriented agricultural education literature (e.g., FAO 1998; Taylor 2000, 2005), but these studies largely remain normative. They offer only limited discussion on the growing body of literature that identifies the inherent complexity of curriculum change and accompanying processes that unfold in a supercomplex reality (Barnett 2000, 2004; Slattery 2006).

To address these issues, we examine the case of a participatory curriculum design process in an African context. Our aim is to identify the challenges that surface when PCD is instigated through an inter-organizational, multi-stakeholder, and top-down managed development process. We ask the following questions:

- Which contradictions characterize the curriculum change process?
- Do these contradictions constitute learning opportunities for the involved parties?

We conceptualize the curriculum change process as an activity system and apply the theoretical and analytical lens of cultural-historical activity theory (CHAT) (Engeström 1987). CHAT is used because the framework encourages us to pay close attention to culture and history, to grasp issues of power and politics, and to simultaneously analyze both micro-

and macro-level elements of change (Lee 2011). CHAT theory is frequently used in educational research (e.g., Fanghanel 2004; Murphy and Rodriguez-Manzanares 2008; Lee 2011) and has demonstrated its ability to support analysis in the above-mentioned supercomplex contextual realities.

We chose the Business and Research in Agricultural Innovation (UniBRAIN) program funded by the Danish International Development Agency (Danida) as our empirical case. Implemented between 2010 and 2016 under the auspices of Forum for Agricultural Research in Africa (FARA), the UniBRAIN program funded six agribusiness innovation incubator consortia. These were based on public-private partnerships, involving a university, a private business enterprise, and a public research organization. The involvement of university staff in business development support within the incubators had an expected spill-over effect. The program also explicitly aimed to enhance the quality of agribusiness education in Africa, which was achieved by initiating an up-to-date curriculum aimed at meeting the labor market requirements of the twenty-first century, as well as to contribute to the development of more entrepreneurial graduate students (UniBRAIN 2010). This objective was addressed by implementing a participatory curriculum development (PCD) process. The expectation was that participants from a wider stakeholder community would be involved by helping to provide their expertise, experience, and ideas to produce a curriculum that would enhance employability and foster entrepreneurship. The PCD process was designed and led by the African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE), a pan-African educational network that organized a number of workshops between 2011 and 2015. Private enterprises and their networks, professional societies, university teachers, university managers, research organizations, and university students took part.

The UniBRAIN process is an interesting PCD case because it involved a very diverse group of stakeholders with divergent interests and perspectives. In addition, Africa's higher education setting is characterized by its relatively limited involvement of other societal sectors, as well as significant resource constraints (Ashcroft and Rayner 2011). We consider this context well-suited for studying complex participatory processes because it is likely to aggravate relational and material challenges associated with the implementation of PCD. The evolved activity system is also interesting to study because of the inherent tensions between aspirations and priorities of top-down (i.e., the externally defined UniBRAIN program curriculum development initiative) and bottom-up (i.e., the special interests and perspectives of local university departments).

Challenges to curriculum development in sub-Saharan Africa

Sub-Saharan African universities vary, but in general are not well-prepared to address the transformation to a knowledge society, despite renewed international political attention since 2000. Structural Adjustment Programs imposed by the International Monetary Fund and the World Bank in the 1990s created a legacy of colonialism and a divestment in higher education systems, leaving Africa with a serious and increasing undersupply of higher education. Furthermore, Wolhuter and Wiseman (2013: 11–12) argue that "universities are still based on the model of universities in the former colonial mother countries, and as such, they tend to be cut off from indigenous African society and communities." The historical trajectory combined with inadequate budgets results in poor infrastructure that lacks basic facilities, relevant curricula, and a dated pedagogy of traditional lecture-dominated study programs.

Students are further at a disadvantage because of the disconnect between higher education and the labor market. Traditionally, strong government control and highly centralized legal frameworks have often limited how universities can respond to societal changes, although responsibility and authority are increasingly being transferred from Ministries of Education to higher education institutions (Abugre 2018). Despite the increase in management at universities, inefficient and highly bureaucratic methods often hamper organizational effectiveness (Collins 2013; Teferra and Altbach 2004). In addition, the last decade has seen increasing competition from for-profit and non-profit private universities (Varghese 2006). The widespread shift towards a dual funding mechanism that relies on both public funding and student tuition fees (Sawyerr 2004) emphasizes the need for educational reforms that enhance relevance and graduate employability.

Curriculum development processes require mechanisms for quality accountability and standards. These procedures should be subject to regular periodical reviews based on an infrastructure of academic committees as well as student and employee advisory councils. Even though such procedures are institutionalized in most major sub-Saharan African universities, Ashcroft and Rayner (2011) argue that it is still not unusual for curriculum development to be seen in some countries as an essentially private activity, conducted and documented by a subject department as it sees fit. The challenge associated with curriculum development is also highlighted by Collins (2011) who notes that impacting curriculum change has been one of the more difficult areas to conduct through international collaboration. He recommends that relevant curricula and adequate teaching modes are best defined through consultation with local and national stakeholders, including "… government, employers, students, and most crucially, academic staff" (Collins 2013: 53). University leaders, educational developers, academic staff, and students are elsewhere identified as main stakeholders (e.g., Ashcroft and Rayner 2011). In general, the literature addressing educational development in sub-Saharan Africa emphasizes that contemporary higher education development is heavily embedded in an organizational and broader societal context.

Participatory curriculum development and university stakeholders

Traditional curriculum design is often led by experts embedded within the university system; in the participatory paradigm, expertise can come from anywhere within the wider stakeholder community, such as educators, subject experts, students, private enterprises, or professional associations. PCD approaches curriculum development through the interchanges of experience and information of key stakeholders related to the curriculum subject (Taylor 2000). These different stakeholders are assumed to be the experts on their own reality and, moreover, by taking co-ownership of the educational process, they have the potential to make important contributions towards creating more relevant and more effective learning (Taylor 2005). Other benefits of adopting participatory approaches to curriculum development include the avoidance of a marginal and unrepresentative group mandating all processes and outcomes; professionals who best know their context and teaching situation can voice their expertise; and contextualized perspectives that identify where knowledge and skill gaps exist are included and can contribute to strategies that target these disparities. PCD also has several potential disadvantages: by comparison to more traditional approaches, participatory processes increase the demand on time and other resources; it is often difficult to cultivate and maintain the interest and commitment of various stakeholders; and creating a mechanism for various

stakeholders to work and interact on an equal basis is quite complex, due to different perceptions, experiences, and educational backgrounds (Taylor 2000). Considering the involved complexity, educational developers need a good understanding of the stakeholder landscape and the available resources in order to stage efficient PCD processes. Stakeholder theory provides a means to address this challenge.

Stakeholder theory and stakeholder management first emerged in research and practice fields in the 1980s (e.g., Clarkson 1995; Freeman 1984; Mitchell et al. 1997). The bulk of the literature addressed the topic from an organization-centric and strategic/instrumental perspective (Friedman and Miles 2006). The stakeholder management concept "serves to ensure organizations recognize, analyze and examine the individual and group characteristics that influence or are influenced by organizational behaviours and actions" (Mainardes et al. 2012). Drawing on the university context, Mainardes et al. (2012) proposed a novel model for classifying the relationship between an organization and its stakeholders. The authors identified 21 specific categories of university stakeholders that are sub-categorized into five types to reflect the mutual relationship of university-stakeholder influence, regulatory stakeholders, dependent stakeholders, passive stakeholders, partner stakeholders, and controller stakeholder. These subcategories include individuals or groups with various degrees of power and interests (Eden and Ackermann 1998) who can influence and/or be influenced by an organization such as a university. Moreover, different stakeholders have competing priorities, preferences, and values. For example, university lecturers and business people may have different opinions about what constitutes the "right" balance between practical skills and theoretical knowledge.

The literature discussing the implications of stakeholder involvement in curriculum development in the sub-Sahara African context is limited, with the notable exceptions of contributions by South African scholars. For example, Meyer and Bushney (2008) identify 18 types of stakeholders and propose a multi-stakeholder-driven model for excellence in higher education curriculum development. Jita (2006) provides another example: drawing on Mitchell et al.'s (1997) model that includes the concepts of power, legitimacy, and urgency, he develops a framework for stakeholder identification and salience for South Africa's Higher Education Quality Assurance (HEQA) systems. These two contributions are purely theoretical, and there seems to be a lacuna of research discussing empirical experiences in the sub-Saharan context.

Cultural-historical activity theory

We conceptualized the process of curriculum change using the CHAT framework, originating with the activity theory work of Russian psychologists Vygotsky (1978) and Leont'ev (1978). Activity theory describes and captures the intricacies of an activity, defined as what people do collectively in processes modified by culture and history (Foot 2014). The process is part of a complex system and involves a rich human texture (Bakhurst 2009).

CHAT provides a framework for linking micro-level analysis of the human interaction with macro-level processes in its environment and draws on two perspectives relevant to the process of curriculum development: systems thinking and social constructivism. It takes into account that activities are open systems (Engeström et al. 1999). It underscores the importance of keeping in mind the "bigger picture," as none of a system's element operate in isolation. By applying CHAT, the importance of considering the environment is highlighted in order to understand the nature of societal dynamics, given that meaning is co-constructed through an active and dynamic process between agents and environments (Ogawa et al. 2008).

The environment of an activity is analyzed in terms of various influencing forces embedded in the context under which the activity takes place. Activity theory emphasizes how *tools* mediate action between a number of *subjects*, oriented by an *object* to produce an *outcome*. The analysis also examines the impact and influence of the surrounding *community*, explicit and implicit *rules*, and the *division of labor*. These tenets comprise the nodes of the activity system (Engeström 1987). Figure 1 illustrates the nodes and their relationships with summaries of their specific content in the case study presented in this article.

In an educational context, object or problem space may constitute, for example, obtaining a "fun" curriculum and a problem-based student project in science education (Lee 2011). The subject represents the individual or group of actors engaged in the activity, for example, teachers and students. To achieve their goal, subjects rely on tools that can be any artifact used in the transformation process, i.e., physical or conceptual in nature, such as hands-on activities and field trips. By using and directing the tools towards the object, the subjects will produce an outcome, for example, increased knowledge and interest. The subjects do not work in isolation but within a community, which comprises other individuals and subgroups who share the same general object. There are differentiated roles and responsibilities within this community context, i.e., division of labor. This can run horizontally with tasks spread across members of equal status in the community, and vertically where tasks are distributed up and down divisions of power. Finally, relationships are governed and constrained by the formal, informal, and technical rules, norms, and conventions of the community. This notion of context constitutes the theory's major strength—the ability to see the big picture. Curriculum change research has often been criticized for its failure to fully analyze the context and merely produce an uncritical and underdeveloped conception of the context (Hargreaves 2005). Activity theory has the potential to overcome these weaknesses.

Contradictions and learning in the activity system

A main contribution of activity theory is its ability to identify contradictions between nodes in an activity system. Contradictions are defined as "a misfit within elements, between them, between different activities, or between different developmental phases of a single activity" (Barab et al. 2002: 80) and emerge as problems, ruptures, breakdowns, and clashes (Kuutti

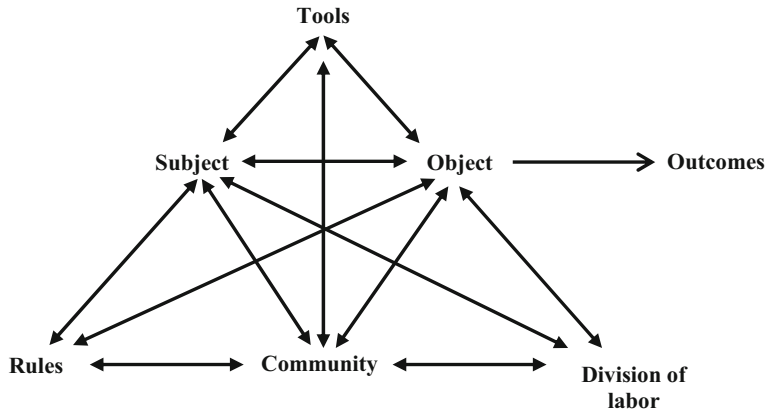


Fig. 1 Basic elements of an activity system (source: Engeström 1987: 78)

1996). Because these contradictions hinder the activity's effective implementation, they have to be addressed by reassessing and redefining each component of the activity systems.

Engeström (2001) identifies four such sets of contradictions: (a) primary, (b) secondary, (c) tertiary, and (d) quaternary. Primary contradictions occur when participants encounter more than one value system attached to an activity, for example, a conflict between the scientific community's educational values and the call from the private sector for more mundane employee competencies. Secondary contradictions arise between the nodes within an activity system, for example, when the necessary educational tools for obtaining the intended learning objects are absent. Tertiary contradictions occur when activity participants face conflicting situations in adopting new and advanced methods to achieve an objective, for example, if students respond negatively to the introduction of new teaching practices. Finally, quaternary contradictions occur between the focal activity system and other activity systems when changes generate conflicts with adjacent activities, for example, if new curriculum content does not align with private sector requirements.

As a basic principle of CHAT, contradictions help to identify tensions and conflicts that emerge in the process of curriculum development. This aspect of the theory is particularly relevant to educational change because it offers a new way to understand curriculum renewal as a contradiction-driven process. Tensions produce disturbances within the system and eventually drive the system to change and develop (Barab et al. 2002). Moreover, while contradictions may create conflicts, interruptions, and clashes, it is through their resolution that changes or development occurs. Contradictions reveal opportunities for creative innovations, as well as new ways to structure and enact the activity. They are "lenses through which participants in an activity can reflect on the developmental trajectory of the activity system and understand its dynamics" (Foot 2001: 12).

By focusing on the roots and origins of the problems, participants can gain an understanding of why certain changes cannot fully be brought to fruition (Bonneau 2013). These root causes can stem from internal, external, organizational, and cultural forces (Oliver and Hyun 2011). Internal forces could include the attitudes of teachers. External forces could include the national agenda, globalization, and societal trends. Organizational forces could include the structures of educational organizations: and cultural forces could include the educational beliefs and discipline-based traditions. Engeström (2001) argues that the collaborative analysis and modeling involved in identifying root causes of problems are an important precondition for the creation of a shared vision for the expansive solution of contradictions. When researchers use the CHAT framework for analysis, they are able to identify these contradictions and to suggest possibilities for expansive learning. This occurs when individual participants or the collective begin to question and deviate from its established norms in a deliberate collective change effort to resolve contradictions (Engeström and Sannino 2010).

The case study

The curriculum reform process analyzed in our study was a result of UniBRAIN, a Danida-funded project launched in 2011, with FARA as the implementing organization. UniBRAIN's overall objective was to create employment and growth. The project aimed to support universities in producing agribusiness graduates with the potential to become efficient entrepreneurs (UniBRAIN 2010). Between 2011 and 2016, the project, among other activities, engaged in a curriculum development process based on a partnership model that involved

research institutes, private sector business partners, and universities in five partnerships in four countries that included Uganda, Kenya, Ghana, and Zambia. This multi-stakeholder curriculum development process was organized and led by the pan-African educational NGO ANAFE. Six universities and a range of stakeholders took part, with the goal to develop exemplary agribusiness curricula at the BSc, MSc, and PhD levels.

In 2011, the ANAFE-led PCD process began with mapping existing educational programs, followed by the first curriculum development workshop the year after to identify educational problems and challenges. Other aims were to design the PCD process to be implemented in subsequent years. Next, ANAFE visited the UniBRAIN universities to identify specific local expectations and institutional conditions, as well as to advocate for the PCD process to top management at the universities. In this phase, local curriculum reform teams were established at each institution and supported with minor funding from UniBRAIN. In 2013, a tracer study was conducted to inform the process, based on a survey of 320 students who had graduated from the universities between 2005 and 2011. From 2013 to 2015, representatives from the local university curriculum reform teams and the broader stakeholder community attended a series of six international curriculum development workshops. These seminars reviewed and discussed the tracer study findings, designed specific curricula at BSc, MSc, and PhD levels, addressed learning material development, and developed best practices for student internship and attachment in the private sector. The agribusiness curricula were published in February 2014 (ANAFE 2014). In 2015, a workshop was held to evaluate initial experiences at two universities where new elements had been implemented. In addition to these activities, a policy dialog held at FARA Science Week and a discussion session at the International Agribusiness Education Fair in 2013 contributed to shaping the final curricula. An overview of the PCD activities implemented between 2011 and 2016 is provided in Appendix Table 1.

Research methodology

We applied a case study approach and qualitative methodology to explore the PCD process. This allowed us to delve deeper into the complex process of curriculum reform within its real-life context (see Yin (2003) for details). Several strategies were applied to enhance trustworthiness, i.e., credibility, transferability, dependability, and confirmability (Guba 1981) of the study. We developed an early familiarity with the setting and organizations involved in the PCD process, and relied on a process of iterative questioning in the longitudinal data collection. This offered opportunities to verify consistency in interviewees' narratives as well as to build trust with key informants (Shenton 2004). In addition, we triangulated data collection by relying on multiple data sources (Creswell 2012). This enabled us to combine semi-structured interviews and video recordings (see Appendix Table 2) with project documents (see Appendix Table 1) which contributed to credibility. The different data sources reduced the effect of researcher bias by compensating for limitations of individual methods and confirmability (Shenton 2004). CHAT itself ensures triangulation of the phenomenon studied by requiring many facets of the broader activity to be examined (Jaradat et al. 2011). The data and data collection were analyzed in parallel and as the analysis progressed, the emerging results were scrutinized in discussions with peers and key informants.

Our data were collected through interviews with key informants (Gilchrist and Williams 1999) across the partnership organizations engaged in the PCD process. Personal and group interviews took place during several visits to East and West Africa between 2012

and 2016. Our research question was focused on the primary activity system that enacted the curriculum development process. We relied on purposeful sampling and identified informants based on two criteria: the informant should (1) be an active participant in the PCD process, and/or (2) hold a managerial position with direct power over and interest in the PCD process outcome. We chose to interview the main controller stakeholders who were faculty deans and department heads at the participating universities. Five university deans and five head of departments were interviewed. We deliberately refrained from interviewing higher-level university governance representatives, as their role was mainly associated with ensuring compliance to formal approval procedures, rather than active engagement in the development process. Additional interviews were conducted with partner stakeholders, including five university students and seven senior lecturers who represented the five involved universities: one public sector researcher, and the ANAFE CEO and one employee (PCD process facilitator). The senior lecturers interviewed were responsible for—or otherwise directly involved in—the implementation of the project. Finally, three private sector CEOs and three staff, who we categorize as dependent stakeholders, were interviewed. Appendix Table 2 provides an overview of interviewees who, with few exceptions, had been personally involved in one or more of the PCD activities outlined in Appendix Table 1.

The dataset consists of semi-structured interviews conducted with groups and individuals, based on an initial interview guided by the CHAT framework. The guide addressed the stakeholders' different objectives, roles, and contributions; the impact of formal and informal rules; the outcomes and impact of the process; and the characteristics of the PCD process. For example, if and why contradictions had emerged, if, how, and with what result had such contradictions been managed? The questions were validated during initial interviews with key informants and the semi-structured format allowed the researchers to probe into the specific aspects that characterized the different university settings during subsequent interviews. All interviews were conducted in English and took between one and one-and-a-half hours. They were transcribed for analysis.

Data from three video-recorded panel discussions on the "process of curriculum review and reforms in tertiary agricultural education institutions" supplemented the interviews. The videos were taped during the FARA Science week held in July 2013 in Accra, Ghana and featured key stakeholders involved in African agribusiness curriculum development, including a student, two deans, a senior lecturer, an NGO CEO, and government research advisor, and a private sector CEO.

We employed content analysis based on methodological guidelines provided by Barab et al. (2004) to analyze the data. First, we conducted a priori coding using the six components of the activity system as predefined categories. Second, we coded for contradictions following the procedure used by Murphy and Rodriguez-Manzanares (2008). We concentrated on the tensions that occurred within the nodes of the activity system (primary contradictions) and those that occurred between elements in the system (secondary contradictions). We did not conduct an exhaustive identification of all the tensions in this activity system, but rather focused on those that regularly appeared in the interviews. In this way, we identified six primary contradictions and four secondary contradictions. Finally, to identify root causes of contradictions, we searched the data for common "threads" by asking the following "generative" question as a schema: "Why did the contradiction appear?" Through a number of iterations, we identified three root causes for contradictions. The analyses were conducted using Nvivo software.

In reality, the PCD process is enacted in a complex social system consisting of multiple interaction activity systems, i.e., what Engeström (1987, 2001) refers to as a third generation CHAT. Since our data were collected with a focus on the specific UniBRAIN PCD process and through the participants in this process, we chose to frame the analysis as a second generation CHAT (i.e., one system as portrayed in Fig. 2), although recognizing that this constitutes an analytical simplification.

Results

The UniBRAIN curriculum development activity system

The subjects of the activity system were the curriculum developers (designated academic staff) and academic decision-makers, who led the curriculum development activity. The object of the system was to develop a modern agribusiness curriculum that would ensure the primary outcome: the creation of a cadre of graduates who were more employable and able to apply their knowledge to entrepreneurship. The curriculum developers and the wider stakeholder community used mediating artifacts or tools to manipulate the object to achieve their goal or outcome. These included meetings, workshops—such as for curriculum development and feedback—publications, visits, seminars, tracer studies, and best practice reports (see Appendix Table 1). An account of these activities is found in Hjortsø et al. (2017). The community of the curriculum development activity was comprised of stakeholders with an interest in the curriculum reform process, such as heads of departments, deans of faculties and principals of colleges, private sector representatives, consultants, lecturers, public sector researchers, students, and NGOs. The activity was organized according to a particular division of labor. With individual universities, a curriculum reform team consisting of their staff and managers was established and made responsible to promote the process internally. These local

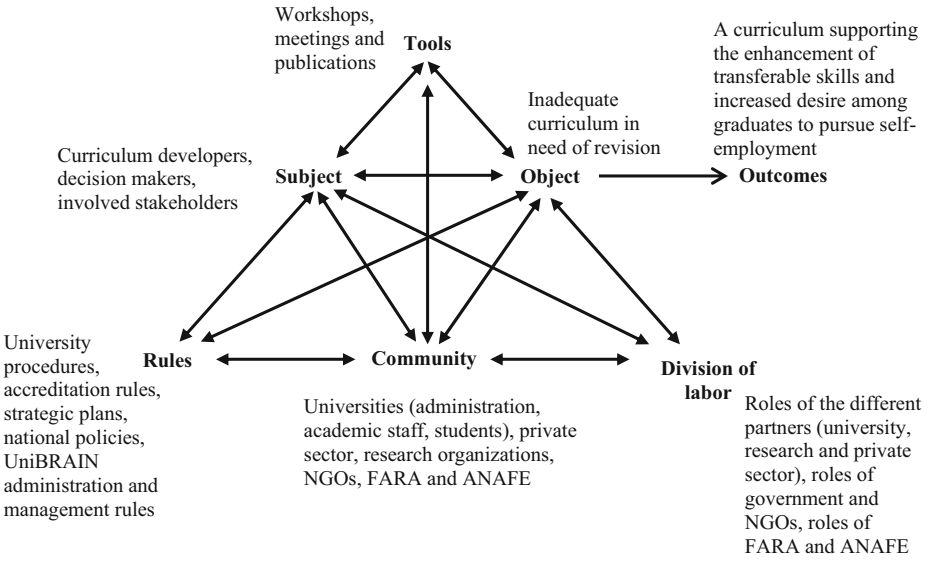


Fig. 2 The UniBRAIN curriculum development activity system

teams were supported by ANAFE, who facilitated the inter-organizational process outlined in Appendix Table 1, as well as lobbying for change with university-level leaderships. The inter-organizational process involved a number of workshops with broad stakeholder participation involving students, representatives from the local university curriculum reform teams, and private, public, and NGO representatives. All these activities were governed by formal and informal rules. For example, new or reformed curriculum had to go through several administrative stages at participating universities. This included, for example, department meetings, the dean committees, and accreditation from board approval. In some cases, approval from the Ministry of Education was required before final implementation. Other formal rules and norms included, for example, the UniBRAIN programs, implementation plans, and administrative procedures to which ANAFE and local partners had to comply.

Primary contradictions—tensions within nodes of the activity system

The subject node's primary contradiction involved the use of a curriculum reform team made up of university academic staff who were in conflict with an "integrated" team of members from both the university setting and the wider stakeholder community. For instance, certain stakeholder groups felt they lacked a voice in the process. As argued by a student:

> Students are the key stakeholders in this curriculum reform process because we are the users of the curriculum. I think that when we keep speaking about curriculum development and want to reform the curricula, we should involve students in this since it will impact on our lives. [Student, S1]

The lack of formal arrangements and resource scarcity made it difficult for the university to engage with a wider stakeholder community. As a consequence, several university staff said they felt detached from practice, as explained by a university dean:

> Our universities are out of step with what is happening in practice; it will be good if we have formal arrangements or agreements with the private sector in terms of student attachment and internship; to assist us to build on the theoretic content that we give to the students. [Dean, D5]

The primary contradiction manifested within the object node was due to disagreements over the pedagogic content necessary to promote self-employment. Additional disagreements emerged among decision-makers regarding the balance between theory and practice, or between agricultural content and business content. The power struggle over the nature of the curriculum is illustrated in this quote from a head of department:

> We are told that, even though the students graduate with an agribusiness degree, first and foremost they are agriculturalists and, therefore agricultural subjects should be compulsory. So it takes out some agribusiness and agricultural economic courses, and we are left with just a few. And that is one of the challenges. [Head of department, D1]

The primary contradiction in the tool node was identified between the traditional university-based and the UniBRAIN-facilitated forums that discussed curriculum matters, i.e., university department workshops versus participatory meetings involving a wider stakeholder community (listed in Appendix Table 1). Although the university representatives generally recognized and accepted that university-level consultation meetings and workshops should include stakeholders, as noted by a senior lecturer, they were often compelled to convene smaller internal discussion forums only, due to the lack of financial and time resources:

> It is not that people do not know that the curriculum development process needs to be participatory. But, like all the participatory processes, it is quite resource intensive. And that is why the curriculum review in most places tends to be comprised of a smaller group of about five or so different disciplines that comes up with a draft document. [Senior lecturer, SL1]

It was often a challenge to get stakeholders in the universities to accept the PCD concept because it represented a paradigm shift from the traditional approach. The following quote illustrates this internal resistance:

> One big problem is how to convince the university to accept the curriculum, to ensure that this UniBRAIN concept of bringing research, university and business together is accepted, and also to ensure that we talk more to the business community so that we can bring them to be partners in this whole UniBRAIN idea. [Dean, D2]

The primary contradiction of the rule node involved a discrepancy between traditional university rules and the introduced UniBRAIN procedures. While the UniBRAIN consortium facilitated the curriculum reform process, local curriculum developers still had to comply with the formal and informal rules and guidelines within their own university settings. Following both sets of rules, at times, proved difficult for the curriculum developers:

> The UniBRAIN consortium has to realize that the universities have their own systems, and they have their own procedures for program formulation and implementation and monitoring. So, they cannot just make something out there and then come and impose it. So what I've been advising them is that what they should do is only to recommend. [Dean, D1]

The primary contradiction in the community node related to the fact that the newly expanded PCD community was constrained by conflicting interests in several ways. For example, the relationship between local university curriculum reform teams and their respective UniBRAIN incubator projects was characterized by asymmetric power relations, as the incubator projects were responsible for allocating funding to the teams. They did so only to a very limited degree, which created significant frustration among university partners. Student involvement in the process was also limited, which may be attributed to a general high level of power distance between students and faculty in African universities, as well as a limited tradition of their active participation in curriculum decisions. In general, although the community agreed on the overall objective to modernize the curriculum, their expectations regarding how to achieve the needed change were highly misaligned.

The primary contradiction in the division of labor node concerned the fact that the introduction of a PCD approach reconfigured the division of labor, giving partners external to the university a bigger role as change agents in the curriculum reform process. The UniBRAIN project allocated funds to ANAFE who created an inter-organizational revision process parallel to formal institutional structures at the universities. This was in contrast to existing curriculum revision procedures that were largely internal to the universities and, in general, relied on a top-down approach in which management defined important elements of the curriculum structure and content. As a dean pointed out:

> The Senate forced all the programs, including our agriculture program, to adopt certain courses such as entrepreneurship. So each program has to offer entrepreneurship, microeconomics, ICT and study skills. Again these are forced into our programs whether you like it or not. [Dean, D5]

Secondary contradictions - tensions between nodes of the activity system

As previously mentioned, secondary contradictions take on the form of tensions between the elements of the activity system. These secondary contradictions may lead the subject to question, change practices, and design solutions that will give rise to a new activity configuration, i.e., foster learning and resolve tension (Bonneau 2013). Four major contradictions were observed between:

- rules and object,
- community members and object,
- tools and community, and
- community and division of labor

The contradiction between the rules and the object emerged as a result of meeting the objective of creating a timely and relevant curriculum, while simultaneously complying with university accreditation processes and quality assurance rules. This usually made curriculum development a prolonged process, and the contradiction led partners to question whether it was possible to produce a timely curriculum, while following the directives of the university that typically prescribed a 6- to 10-year curriculum revision cycle. Several participants commented on this paradox, including a private sector CEO:

> How can we design tailor-made programs and courses that are responding to immediate needs while having to go through the [university's] formality? [Private sector CEO, PS1]

The contradiction between community members and the object arose due to the multi-voiced nature of the curriculum development process. The presence of partners with varying and, at times, contrasting goals meant it was difficult to find a shared perspective. In addition, not all members within the different organizations were fully aware of the UniBRAIN program's objective:

> Even though they are partners, it is the bottom [of the organizational hierarchy] that is the partner and not the top. So this issue of curriculum review has become difficult because the top [the faculty leadership] is thinking differently of what the UniBRAIN idea is all about. [Senior researcher R1]

The contradiction between the tools and the community emerged because the tools did not allow stakeholders to fully participate. This contradiction was especially evident where concerns over cost made the decision to conduct "convenient," smaller events (workshops and meetings) more compelling:

> Do we involve various stakeholders? I would say the level of involvement is low. Initially, when we started the curriculum development process we had some consultation but now it is more informal than formal. We are also still tweaking a lot of our courses and things. It will be expensive to go back to these stakeholders for formal gatherings, so it is less so. [Dean, D5]

Finally, there was a contradiction between the community and division of labor due to lack of clarity over roles that affected the ability of the curriculum reform teams and the wider community to achieve the object of the activity. More specifically, the lack of agreement

between partners on their mutual roles in the process affected the scope and degree of the object's accomplishment. An example of this contradiction was provided by a dean:

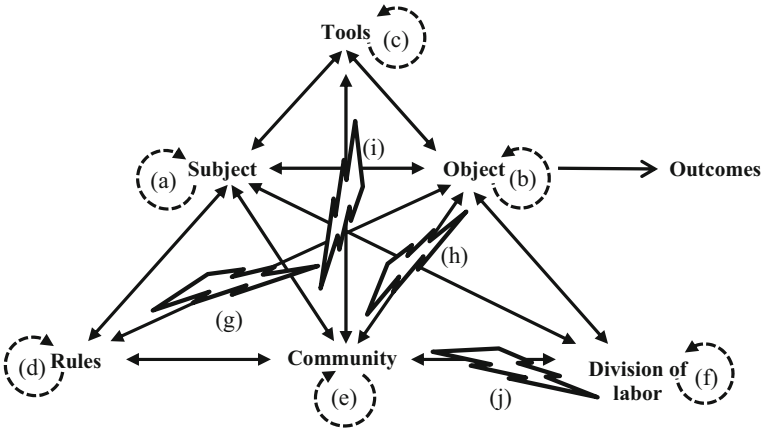
> The UniBRAIN project hired a consultant who went and found what is happening in the universities and made their own opinion. And now, they wanted to form this program and call it agribusiness, and then make universities take this. And then we said it can never work like that. [Dean, D1]

Figure 3 summarizes the six primary contradictions (a–f) and four secondary contradictions (g–i) identified in the UniBRAIN case study.

Learning opportunities

Participants need to resolve contradictions when they arise in order for the activity system to return to a state where the subjects can agree on a common object (Engeström 1987). Identification and resolution of root causes are key steps in eliminating the contradictory positions. In our analysis, we identified that contradictions were mainly rooted in issues concerning:

- stakeholder relation,
- rules rigidity, and
- resource availability



Tensions – Primary contradictions

(a) University staff curriculum reform team vs. integrated team of stakeholder representatives
(b) Core science discipline and theory focus vs. entrepreneurship and practice focus
(c) University-centered meetings vs. broader stakeholder engaging workshops
(d) University institutions and rules vs. external project procedures and processes
(e) Community with misaligned interests and perceptions vs. consensus within community
(f) Universities as change agents vs. external project-driven change

Tensions – Secondary contradictions

(g) Following university procedures vs. adopting curriculum to rapidly changing labor market demand
(h) Disagreement/unawareness about objective vs. collective perception of objective
(i) Lack of representation of full community vs. broad stakeholder engagement
(j) Lack of consensus on roles vs. agreement on division of role among stakeholders

Fig. 3 Contradictions within UniBRAIN curriculum development activity system

First, several contradictions emerged due to the inadequate management of stakeholder relations, in part a result of diverging agendas, insufficient communication among stakeholders, the informality of stakeholder relationships, and role ambiguity. For instance, the informality of relations meant that partners often lacked commitment to the process. The relational informality primarily refers to the PCD process promoted by UniBRAIN and ANAFE, i.e., stakeholders without formal authority within the university systems. The PCD process, therefore, had no formal way of ensuring the universities were committed to the participatory nature of the curriculum reform procedures. Private sector actors lamented the fact that the universities lacked formal structures to promote and facilitate their active participation. As argued by an enterprise CEO:

> I just want to say from experience about the engagement [of the private sector]: what strategy does the university have in place to engaging the private sector? The engagement is very informal, that's the reality. [Private sector CEO, C1]

Yet, these issues provided learning opportunities, and their resolution paved the way for the achievement of a more efficient activity system. Reassessing the community node and redefining stakeholder relations were key steps towards an improved PCD process. In the UniBRAIN project, this was done through (a) improving the dialog among stakeholders, (b) using opportunities to clarify mutual expectations, and (c) making explicit the different agendas and biases of the participants as much as possible. It was also recognized that working relationships needed to be formalized, and outcomes aligned with local policy processes and organizational decision-making in order to be relevant in practice, as well as to facilitate the institutionalization of new practices.

Second, paradoxes such as those that existed between the requirements of accreditation systems (that generated a time-lag) and the general objective of producing a timely curriculum demonstrated the mismatch between the current university administrative curriculum revision procedures and the PCD approach. For instance, the current university curriculum development process involved various steps and procedures considered necessary to ensure program quality and legitimacy. Yet, to other stakeholders, these same procedures and practices were considered red tape and administrative rigidity that decelerated the process. One stakeholder noted that:

> If it is going to take three years for it [the new curriculum] to go through the bureaucracy to come back and be implemented, by that time the component you want to integrate, it has been passed by time. So it becomes very irrelevant. [Student, S1]

It is essential that curriculum developers pay attention to the rules and structures that govern curriculum development (Shore et al. 1993), but they also need to be creative in designing processes that ensure maximum flexibility within the given institutional framework. Learning from the difficulties in promoting local change, ANAFE increasingly focused on obtaining inter-organizational outcomes, such as generalized curricula and internship guidelines that were broadly applicable when local processes accommodate change in the future.

Third, the perceived lack of resources (financial, human, infrastructure, etc.) created several of the contradictions that emerged, for example, as expressed by a dean:

> So, we could talk about teaching, we could talk about practice, we could talk about outreach. Also all those things that you will need to do with student research. But, it so happens that without adequate funding, you have to do some of those things, maybe not

> in the way you wanted. The way we teach here, probably would not be that way, if we had the resources. [Head of department, H2]

PCD entails significant costs to participating stakeholders, and participatory activities can be costly—not only for an organization or a project, but also for local people themselves (Campilan 1996). New training needs would also emerge as a result of the introduction of PCD and certain groups might need special support to enable them to participate more fully and meaningfully (Taylor 2005). ANAFE addressed this challenge and obtained synergy by integrating different but related donor-funded educational activities in their project portfolio, but there are very few examples where universities aimed to identify alternative sources of resources to ensure successful outcomes of the local process.

Discussion and practical implications

There is a growing interest in practice-based research and theorizing, and the use of practice theory as a framework for (re)shaping professional and academic practices has increased (Foot 2014; Roth 2004). Activity theory offers a way to examine complex practices. In this study, we have applied it to the field of education planning, particularly curriculum development in higher education. The research provides a rare account of PCD in a developing country context and contributes to curriculum theory by expanding our understanding of curriculum reform processes, particularly the types of contradictions that characterize PCD processes and whether such contradictions constitute learning opportunities. We find that applying CHAT has been an effective means of identifying tensions in the curriculum revision activity system, some of which have constituted learning opportunities for the stakeholders involved. In the following, we will focus our discussion on tensions related to the stakeholder community node, i.e., (e), (i), (h), and (j) in Fig. 3. We will also discuss how CHAT and stakeholder analysis may enhance PCD processes.

In Fig. 3, we can see that the "community" is a challenging node in the PCD activity system. Several tensions emerged involving the broader group of stakeholders involved in the process, including different perceptions about the curriculum content, unawareness of project objectives, disagreement on how to organize the process, and dissatisfaction with the degree of influence. Consequently, stakeholder relations were identified as a root cause of tension.

Contemporary literature on curriculum reform in Africa identifies core stakeholder categories, but the list is often limited to students, academic and administrative staff, and university management. Some authors include "the community" (e.g., Ashcroft and Rayner 2011). Drawing on the findings of Mainardes et al. (2012) and Meyer and Bushney (2008), there seems to be a need for more serious engagement with the questions of "who are the legitimate stakeholders to involve in curriculum development?" as well as how to involve them in the process, i.e., how to design and manage processes that ensure their participation on equal terms (Taylor 2000).

Identifying and characterizing stakeholders in terms of mapping interest in and power to change the curriculum seem relatively straightforward. The literature is rich in frameworks that help answer the first question of "who" (cf. Friedman and Miles 2006). But answering the "how" question is more challenging. Limited research addresses this more complex and dynamic issue of "managing" or engaging with identified stakeholders, i.e., how to create curriculum development processes that rely on genuine and equal participation, transparency

in process, legitimate representation, proactive engagement in emerging tensions, and joint expansive learning among stakeholders.

Ideally, PCD prescribes a significant level of involvement that may create high expectations among stakeholders—expectations that depend on the political will of key stakeholders at universities (subject node) and the commitment of resources to be fulfilled. Goodwill and resources cannot be taken for granted, especially if the PCD process is initiated by actors external to the higher education institutions. Good knowledge of the social and institutional aspects of the activity system in which the PCD process unfolds is a prerequisite for effective process design. Robust approaches are needed to capture the context and to avoid overlooking potential contributions from stakeholders. Combing stakeholder analysis and the CHAT framework provides a means to address this need. For example, we believe that the conflict between university-intern formal accreditation rules and the more informal and externally initiated PCD approach could have been foreseen and mitigated through a stakeholder analysis, combined with a pre-project characterization of the activity system designed by UniBRAIN and ANAFE. Such analysis could have captured the diverse value systems at play, as well as indicated root causes of potential contradictions associated with the organizational and institutional setting.

Our analysis shows some tensions constituted learning opportunities that led to changes in the implementation approach. For example, when stakeholders expressed their lack of voice in the private agribusiness sector, ANAFE developed opportunities to involve private sector representatives in the process. But other opportunities were missed. For example, the universities were less responsive to the critique raised by students of not being adequately involved. Whether tensions are responded to depends on (1) whether they are recognized, and (2) whether the necessary organizational will (or power), capability, and resources exist to respond. The CHAT approach provides a coherent framework for recognizing tensions, and PCD projects could rely on participatory monitoring approaches (Estrella 2000) as a means of ensuring that less powerful stakeholder groups are heard. The degree of legitimacy attributed to other stakeholder groups is a critical aspect that influences the willingness of powerful stakeholders to respond to experienced tensions is (Mitchell et al. 1997). Stakeholder analysis provides PCD projects with a means of clearly defining which stakeholders have a legitimate claim to be formally included in the process, and this subsequently makes it difficult for more powerful actors to ignore them. The lack of constructive engagement by key stakeholders who experience tensions may be alleviated by a priori ensuring commitment, as well as ownership to the process. Taylor (2005) reminds us that some stakeholders may need training to establish the capacities needed for engaging in PCD efficiently, and it would be highly relevant to use training activities as a way to target emerging tensions. For example, when student representatives expressed discontent, the UniBRAIN project could have staged training events for project participants on how individual interviews, focus groups, and design thinking workshops (Diefenthaler et al. 2017) could be used to obtain curriculum development input from students and teachers. Likewise, the lack of resources for conducting stakeholder meetings could have prompted training in fundraising or the acquisition of other types of resources through university-private or civil sector partnerships.

The UniBRAIN project was designed by "outsiders" (i.e., FARA), rather than "insiders" (Chambers 1997), i.e., university staff, students, and local communities. Universities increasingly have to comply with outsider requirements, e.g., in terms of national and transnational models of quality assurance (such as the Higher Education Quality Committee in South Africa). A growing formalization of curriculum development procedures is one result of this

(Ashcroft and Rayner 2011), and of managerial processes in general (Collins 2013). Our study shows that in practice, the present forms of quality assurance processes (rule node) often constitute a limitation on universities to respond in a timely way to contemporary labor market requirements. Formal and externally defined quality assurance regimes are likely to provide better incentives for universities to comply, but such systems may not necessarily assure genuine stakeholder involvement. Our study shows that PCD can provide a feasible way to ensure such involvement, but also reveals the challenges associated with managing multiple stakeholders' expectations, objectives, and efforts in order to secure constructive action within the curriculum development activity system.

We show how, given its analytical strength, CHAT can contribute to organizational studies. In this research, we expand the use of activity theory to the curriculum development scenario and have demonstrated it to be both useful and robust in providing a thorough analysis of this complex activity. We contribute to the PCD literature by explicitly integrating a stakeholder theory perspective, in addition to outlining potential ways to enhance participatory approaches through stakeholder analysis and management. This includes using CHAT as an analytical tool during the project design phase, as well as a means for identifying tensions that emerge during project implementation. We also extend the contribution of Mainardes et al. (2012) in terms of indicating an important area for future stakeholder research. Whereas the present literature on university stakeholders focuses on identifying and characterizing stakeholders, we identify an intriguing context for future stakeholder theory development, focused on the stakeholder relationship and management dimension.

Our study suffers from two main limitations. The activity setting can be conceptualized as consisting of three levels of analysis: the institutional-community, interpersonal, and personal. Because the activity setting is very complex, Rogoff (1995) suggests zooming in on one level. We have mainly focused on the interpersonal level and refrained from addressing the other dimensions in significant detail. Additional inquiry would integrate more explicitly all three levels of analysis. We chose to focus on the narrow project implementation system and our study was limited to the activity systems defined by the boundary of the UniBRAIN project. Therefore, the analysis excludes the defined system's interactions with adjacent systems, such as the higher-level university organizational system, practical teaching level systems, or the national higher education policy system level. An expansion of the analysis by conceptualizing PCD as a third generation multi-activity system would provide an even more finely grained understanding of dialogs, multiple perspectives, and networks of interacting activity systems (Engeström et al. 1999). In addition, our research far from exhausts the addressed topic; further work is needed to scrutinize the multi-stakeholder PCD processes under different institutional and cultural conditions in sub-Saharan Africa and beyond.

Conclusion and recommendations

In this article, we explored the nature of PCD processes, an under-studied topic in the higher education literature. We showed that CHAT is well-suited for analyzing the complex institutional, social, and organizational contexts in which curriculum design processes are embedded. Specifically, CHAT can support decision-makers and stakeholders to capture and categorize contradictions and tensions within a PCD activity system. We enhance the CHAT approach by explicitly integrating it with a stakeholder analysis. Whereas CHAT makes explicit systemic tensions within the activity system, stakeholder analysis facilitates an understanding of how

the PCD processes may be influenced by different stakeholders' interests, resources, and power relations. These findings have practical implications for curriculum design. In combination, CHAT and stakeholder analysis can provide a strong analytical methodology in relation to the planning stage of curriculum reform initiatives as well as for ongoing implementation monitoring. We contend that CHAT can enhance PCD processes by a priori identifying contradictions among stakeholder interests, values, and goals to help educational planners turn resulting potential tensions into participatory learning opportunities—or to engage in timely stakeholder management efforts to facilitate reform implementation. A major challenge to PCD is to ensure genuine stakeholder involvement; CHAT and stakeholder analysis together provide educational planners with the means to ensure PCD processes are designed to best ensure legitimate stakeholders can voice their interests, that urgent societal demands are addressed, and that power relations that could lead to contradictions and tensions among stakeholders are constructively addressed.

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Appendix

Table 1 Timeline of activities and publications used from the curriculum development process

Year	Activity
2011	
October	A mapping of UniBRAIN universities agribusiness education programs
2012	
February	The UniBRAIN agribusiness curriculum development workshop in Kenya
Sept.–Oct.	ANAFE visits the UniBRAIN partnerships' universities, advocacy with university leaderships
October	*Publication*: Synthesis of outcome of visits to the UniBRAIN consortia
2013	
April	Agribusiness tracer study validation workshop in Zambia
June	*Publication*: A tracer study of graduates from UniBRAIN universities
July	Policy dialog on curriculum reforms held during the FARA Science Week in Ghana
October	The international agribusiness education fair held in Nairobi. Dialog on how to make tertiary agricultural education more relevant to business development in Africa
November	Curriculum development workshop held in Zambia
December	Learning material development workshop held in Cote D'Ivoire
December	Curriculum development workshop held in Kenya
2014	
February	*Publication*: Exemplary agribusiness curricula framework: bachelors, masters and PhD
May	Workshop to develop an innovative agribusiness attachment/internship guide for sub-Saharan Africa held in Kenya
2015	
January	*Publication*: Agribusiness policy framework for sub-Saharan Africa: seeking the balance and consensus—best practice report
January	Agribusiness curriculum implementation feedback workshop held in Kenya
2016	
January	*Publication*: A guide to agribusiness internship and attachment in sub-Saharan Africa

Table 2 Summary of interview and video-recording data

Code	Type of respondent	Type of organization/ case number[a]	Data source	Interviews
D1	Dean	University/C1	Personal interview	May 2013, January 2014
H1	Head of department	University/C1	Personal interview	May 2013, February 2016
SL1	Senior lecturer	University/C1	Personal interview	May 2013
SL2	Senior lecturer	University/C1	Personal interview	November 2012, January 2014
PS1G	CEO, 1 staff	Private sector/C1	Group interview	November 2012, May 2013, December 2013
PS1	CEO	Private sector/C1	Personal interview	September 2015
D2	Dean	University/C2	Personal interview	July 2013, November 2013
H2	Head of department	University/C2	Personal interview	July 2013, January 2016
H3	Head of department	University/C2	Personal interview	November 2013, January 2016
D3	Dean	University/C3	Personal interview	November 2012
SL3	Senior lecturer	University/C3	Personal interview	November 2012, February 2016
D4	Dean	University/C4	Personal interview	November 2012, June 2013; December 2013, February 2016
U5G	Senior lecturer, dean	University/C4	Group interview	November 2012, February 2016
SR1	Senior researcher	Research org./C5	Personal interview	December 2013
U5G	Head of department, 2 senior lecturers	University/C5	Group interview	November 2012
H4	Head of department	University/C5	Personal interview	December 2013, June 2015, February 2016
PS2	CEO, 2 staffs	Private sector/C5	Group interview	May 2013, February 2016
NGO1	Staff	NGO	Personal interview	November 2012, January 2014
S1	5 students	University/C3	Group interview	February 2016
S2	Student	University	Video recording	July 2013, FARA conference
D5	Dean	University	Video recording	July 2013, FARA conference
D6	Dean	University	Video recording	July 2013, FARA conference
SL2	Senior lecturer	University	Video recording	July 2013, FARA conference
C1	CEO	Private sector	Video recording	July 2013, FARA conference
SRA1	Senior research advisor	NGO	Video recording	July 2013, FARA conference
NGO2	CEO	NGO	Personal interview	February 2016

[a] C1–C5 indicate the relationship to the five different university-private business enterprise-public research organization partnerships in UniBRAIN

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