Disciplinary Cultures that Underlie Academic Discipline at Makerere University: Implications for Academic Research

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Abstract
The purpose of this study was to tease out disciplinary cultures that dominantly exist at Makerere University and the implications of these cultures on University research. The study accomplished this by accessing lead researchers’ and senior level institutional research managers’ voices regarding the existing disciplinary cultures. We adopted a qualitative, intrinsic case study design that was rooted in social constructivism philosophy and guided by an interpretivist paradigm. Professorial staff and Institutional level senior research managers constituted the sample. Data were collected using in-depth interviews from four Full Professors, eight Associate Professors, and two institutional level senior research managers. We then triangulated data sources with documents checks. We analysed data thematically. Findings showed that the cultures of interdisciplinarity; establishing collaborations and partnerships; engaging in applied research, producing knowledge at the very basic level, and publishing in top-ranked journals dominantly exist across disciplinary fields at Makerere University. It was also revealed that despite variation regarding the deepening of the above cultures across disciplinary fields, no particular culture was found to be mutually exclusive to a single disciplinary field. It was also concluded that disciplinary cultures are shifting and that the research direction of the University is to a reasonable degree an offshoot of the dominant disciplinary cultures.

Keywords: Disciplinary cultures, academic disciplines, academic research

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Univer{s}ities are operating in a changing environment characterized by government and higher education policy development, demographic shifts, market forces, economic restructuring, and internationalization (Sehoole & deWit, 2014; Middlehurst & Woodfield, 2007). As they respond to these changes in order to remain competitive, the need for an investigation of cultures that underlie disciplinary fields and research orientations becomes important (Georgeta, 2009). Although authors agree on the influence of culture on academic institutions (Tierney, 2008; Silver, 2003; Clark, 1998; Dill, 1982) it is not clear how university culture functions. The emphasis can lie on the faculty, the discipline, or the whole organization. Some have even questioned whether a university has a culture (Silver, 2003 & Sporn, 1996). Sporn (1996) for instance argued that the contemporary university may be conceived as a “culture of extreme diversity” or a “culture of fragmentation in tension”. He concluded that parts of what exists in a university are “subcultures” which cannot be aggregated as a culture.

In a similar vein, Bush (2008) argued that institutionalizing culture may mean subordinating the values and beliefs of participants to those of the leaders which may result into “ideological control” and “manipulation”. From the above, it can be inferred that universities are an amalgamation of autonomous subunits with loose links and a high degree of specialization rendering them, according to Bisaso (2011) “into a loosely coupled organizations” (p.19). It is therefore not surprising that a number of scholars have tried to explain the functioning of universities through analyzing the impact of academic disciplines on specific attitudes, values and behaviours of academics (Bisaso, 2011; Henkel, 2005; Becher & Trowler, 2001; Ylijoki, 2000; Clark, 1987). Instead of being oriented towards their institution, academics are increasingly identifying themselves with their individual, discipline-based careers (De zilwa, 2006). Hence the “disciplinary cultures” tradition has come into vogue in the analysis of the concept of culture in higher education.

The term disciplinary culture is commonly used to describe a major quality of universities, that is, the separation of work according to different disciplines whose perspectives, practices and tasks can vary considerably (Alise, 2008; Becher & Trowler, 2001; Kekale, 2002; Kuteeva & Negretti, 2015; Ylijoki, 2000). Disciplinary cultures represent the heterogeneity of academic disciplines that differ from each other cognitively and socially (Clark, 1987). According to Ylijoki (2000), disciplinary cultures connote cultures that emerge as a result of the differences in disciplinary traditions and categories of thought which provide disciplinary members with common cognitive and social characteristics. Becher & Trowler (2001) defined disciplinary cultures as those that emerge as a result of academic tribes and territories that form the basis of the social life of the field. To Biglan (1973), disciplinary culture signifies that culture that develops as a result of the uniqueness of knowledge produced giving rise to different academic specialties, beliefs about theory, methodology, techniques, and problems. In this study, we take disciplinary cultures to be those practices, values and beliefs that surface as a result of the ways in which different knowledge is produced and taught across the various academic fields. Academic research, on the other hand, has been defined according to Leisyte’s (2007) conceptualization to mean research practices of academics leading to the advancement of basic and applied knowledge in certain academic disciplinary fields. Whereas a number of empirical studies have investigated disciplinary cultures in universities, many of them have extensively focused on the subject in the context of the Western world (Biglan, 1973; Guba & Lincoln, 1988; Alise, 2008; Faricy, 1974; Becher & Trowler, 2001; Becher, 1987; Neuman, 2001; Kekale, 1999). Few studies have explored the existing disciplinary cultures within Sub-Saharan African universities yet an understanding of these
cultures is critical in discerning the nature and motive of academic research. Drawing on data from semi-structured interviews with eight Associate Professors, four Full Professors, and two institutional-level senior research managers, we provide scholarly attention of the matter by accessing their voices regarding disciplinary cultures that underlie academic disciplines in Uganda’s premier research-led institution, Makerere University.

One of the most powerful explanations of disciplinary cultures in universities is that of Becher & Trowler (2001) in which they viewed disciplines as academic tribes occupying different academic territories. To them, disciplinary cultures are built around fields of study dealing in knowledge as the primary raw material. In their anthropological framework, they observed that the academic territory differs in two cognitive dimensions: the hard-soft and pure-applied. Their view is reminiscent of Biglan’s (1973) earlier submission that the academic organization radiates four disciplinary categories, namely hard-pure, hard-applied, soft-pure, and soft-applied. The hard-pure disciplines are the natural sciences such as physics and a cumulative scientific inquiry and aim at discovering universal principles. The hard-applied disciplines such as engineering are pragmatic and aim at producing new products and techniques. The soft-pure category such as history emphasizes particularities and aim at understanding and interpreting phenomena. Last but not least, the soft-applied disciplines such as education and economics provide functional knowledge and aim at improving professional practice. However, as Becher and Trowler (2001) opine, there may be differences among disciplines located in the same cognitive territory. The different branches of the single discipline may also belong to different territories.

Location in an academic territory forms the basis for the social life of the field (Ylojoki, 2000; Becher & Trowler, 2001). Within the academic territory, members share beliefs about: theory; methodology; techniques; types of actions; modes of action; modes of interaction; publication patterns; collaboration patterns; core values and beliefs; taboos; ways to control, share (teamwork), punish and reward their members; and patterns of communication (Clark, 1983; Ylijoki, 2000; Becher & Trowler, 2001). To gain membership within an academic territory, members have to be socialized in the above cognitive and social elements of the disciplinary culture to be accepted in the tribe (Becher, 1994).

Membership of academics to academic tribes and territories notably disciplines within universities affords them stable and lawful identities (Castells, 1997). Previous studies indicate that as a source of meaning and self-worth, research is essential to the disciplinary identity of academics (Alise, 2008; Henkel, 2005; Hakala & Ylijoki, 2001; Leisyte, 2007). But disciplinary identity implies a rigid relationship between knowledge domains and disciplinary cultures. This inflexible relationship that is informed by earlier conceptualizations of disciplinary cultures is mostly associated with Biglan (1973); and Becher & Trowler (2001) who in their disciplinary clustering came up with two cognitive dimensions: the hard-soft and pure-applied. However, there are scholars that view Biglan (1973) and Becher & Trowler’s (2001) classification of disciplinary cultures as too old school and that it no longer preserves its plausibility given the 21st Century changing higher education environment that is characterized by shifting relationships between the state, the market, academic actors and universities that have driven the latter into diverse forms of academic capitalism (Henkel, 2005; Slaughter & Leslie, 1997; Gibbons, Limoges, Nowotny, Schwartzman, Scott, & Trow, 1994; Kekale & Lehikoinen, 2000; Etzkowitz, 2003). Accordingly, the thesis that the traditional cultures as discerned by Biglan (1973) and Becher & Trowler (2001) are no longer tenable is gaining credence.
Premised on the above and given the growing enthusiasm for the pursuit of academic capitalism, it can safely be stated that the boundaries within which knowledge is produced are shifting. This move has resulted in collaborations between disciplines and other stakeholders implying that researchers are now dealing with problems identified by practitioners (Reddy, 2011). The permanence of basic research (which is disciplinary based) as a defining activity of academic scientists and of the discipline as the source of ideas for knowledge production is thus increasingly being challenged (Henkel, 2005; Reddy, 2011). It is also argued that because academic research is progressively directed towards finding solutions to practical problems, there is a move to transdisciplinarity where the final research output is traceable to several disciplines (Gibbons, et al., 1994; Bogelund, 2015; Etzkowitz & Leydesdorff, 1997).

The concept of knowledge production has thus entered the realm of social constructivism which according to Bogelund (2015) implies that knowledge is no longer true per se; it is a product created through a reassuring process where academic scientists are altering from being discipline-centered producers of knowledge to those where several actors cooperate to create growth and profit.

Issuing from the above and in accordance with: Bunting, Cloete & Van Schalkwyk (2014); Hayward and Ncayiyana, (2014); and Reddy (2011) it is safe to assert that the shifting role of the university as a crucial player in the national innovation system and as an instrument of global competitiveness threatens the stability of disciplinary cultures, disciplinary identity, and knowledge domains. However, shifts in disciplinary cultures have been contested by some scholars. For example, Latour (1987) and Vabo (2002 cited in Henkel, 2005) found out that much as some type of disciplinary elite representing more professionalized disciplines such as engineering and medicine tend to open up their disciplines to more overt external influence, they at the same time attempt to protect dominant interests and values in their communities by maximizing their influence in the policy-making process. The above notwithstanding, it should be appreciated that given the heightened emphasis on the social relevance of the university (Cherney et al., 2013) and the need to catalyze the innovation process through knowledge production (Pamfie, Guisca & Bumba, 2014) disciplinary elites have had to inevitably open up their disciplines. It can thus be concluded that disciplinary cultures and identities are transforming because of forces affecting the structure of higher education both from within and without the academe.

However, the extent to which disciplinary cultures and identities at Makerere University have transformed is still unclear. Besides, as observed by Hakala (2009), most of the previous studies on disciplinary cultures in universities neglected the external forces that shape cultural identities. Moreover, many of these studies were conducted in the developed world, especially the United States and Europe (Biglan, 1973; Becher, 1989; Valimaa, 1998; Ylijoki, 2000; Becher & Trowler, 2001; Henkel, 2005; Ylijoki, 2008; Alise, 2008; Ylijoki, Lyttinen & Marttila, 2011). The need to explore the validity of their observations to Makerere University cannot be over emphasized. Apart from Becher (1990 cited in Bisaso, 2011) who found out that disciplinary cultures fail to galvanize academic staff into endeavours meant to retain “a measure of collective independence” (p. 22), most authors overlooked the weaknesses of disciplinary cultures such as; inability to infuse a common vocabulary that is recognizable by outsiders; denying the institution that unity that triggers a high degree of identification; and the absence of shared goals. Conversely, de Zilwa (2006) and Clark (1998) highlighted the negative effects of disciplinary cultures in universities.
Methods
We conducted this study in a manner that is aligned with the social constructivism philosophy where the notion that reality is socially constructed and given meaning by people is important. Congruent with social constructivism philosophy, we chose to use qualitative methods and root the study in the interpretive paradigm that is based on the assumption that social life is shaped by people’s experiences and social contexts and that the nature of phenomena is subjective with people constructing meanings that are varied and multiple (Creswell, 2007). We used an intrinsic case study design because it enabled us to gain a better understanding of Makerere University regarding the disciplinary cultures that underlie academic disciplines and their implications for academic research.

To ensure holistic coverage of the University, we stratified the University into colleges and these became analogous to combined disciplinary fields along the hard-soft and pure-applied dimensions. The selection of disciplinary fields was based on Biglan’s (1973) classification of disciplines. We selected eight participants from the category of Associate Professors and four participants from the category of Full Professors from the four disciplinary fields namely: hard-applied (medicine, engineering, and agriculture); hard-pure (chemistry, botany, and zoology); soft-applied fields (law, education, and economics); and soft-pure fields (sociology, philosophy, and anthropology). In addition, two institutional level senior research managers working in the Directorates of Research and Quality Assurance were also selected. The total number of study participants was fourteen. We purposively selected participants on basis of knowledge of their disciplinary domains and prolific contribution to knowledge production. As such, we made consideration for seniority, the number of publications, PhDs graduated, and grants won.

Table 1: Distribution of Participants by disciplinary field and managerial levels

<table>
<thead>
<tr>
<th>Category</th>
<th>Disciplinary Field</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Researchers at the rank of</td>
<td>Hard-pure (FPHP)</td>
<td>1</td>
</tr>
<tr>
<td>Full Professor</td>
<td>Hard-applied (FPHA)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Soft-pure (FPSP)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Soft-applied (FPSA)</td>
<td>1</td>
</tr>
<tr>
<td>Lead Researchers at the rank of</td>
<td>Hard-pure (APHP)</td>
<td>2</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>Hard-applied (APHA)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Soft-pure (APSP)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Soft-applied (APSA)</td>
<td>2</td>
</tr>
<tr>
<td>Institutional-level Senior</td>
<td>Directorate of Research and Graduate Training</td>
<td>1</td>
</tr>
<tr>
<td>Research Managers</td>
<td>(RMIL1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Directorate of Quality Assurance (RMIL2)</td>
<td>1</td>
</tr>
<tr>
<td>Total Number of Participants</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>

To ensure confidentiality and anonymity we assigned each participant a pseudonym. Based on academic ranks, FP denotes Full Professor, AP denotes Associate Professor and RMIL denote research manager at the institutional level. For the disciplinary categorisation, HP denotes Hard Pure, HA-Hard Applied, SP-Soft Pure, and SA-Soft Applied. In the end, the following pseudonyms were used for the Full Professorial category: FPHP, FPHA, FPSP, and FPSA. For the category of Associate Professors, the alphanumeric Pseudonyms were:
APHP1, APHP2, APHA1, APHA2, APSP1, APSP2, APSA1, and APSA2. RMIL1. Finally, for the category of institutional level senior research managers, the alphanumeric pseudonyms were: RMIL1 and RMIL2. We collected data using in-depth interviews for primary data and documents analysis as secondary data sources and analysed using thematic analysis. We used strategic plans, annual reports, and research policies as the main documents.

Findings
Findings based on data from semi-structured interviews among lead researchers, institutional level senior research managers and document checks revealed four dominant disciplinary cultures among academic disciplines at Makerere University. These are: interdisciplinarity; establishing international collaborations and partnerships; engaging in applied research; and producing knowledge at the very basic level.

Culture of interdisciplinarity
Mode 2 science advocates transcending disciplinary boundaries as a way of enhancing scientific credibility and societal relevance of research. This entails co-production of knowledge in interdisciplinary or multidisciplinary settings. Study participants in both pure and applied disciplines acknowledged that they value interdisciplinarity as this could be explicitly seen in their narrations. For instance, Full Professors FPHP and FPSA from the hard-pure and soft-applied fields respectively shared that:

As plant physiologists, we are involved in giving knowledge at the very basic level about plant functions. Although the nature of knowledge is structured, we also value Team work. For example, I would want to use knowledge of a chemist to identify specific chemicals in plants. Collaborating with others to produce knowledge is important (FPHP).

Law is not self-contained. There is a lot of team work and collaboration. If for example you look at the research program of the Human Rights Peace Centre (HURIPEC), we have done research with health sciences, architecture, and agriculture (FPSA).

Associate Professors also highlighted the importance of teamwork and interdisciplinarity. APSP2 from the soft-pure field (academic research orientation) and APHA1 from the hard-applied domain (entrepreneurial research orientation) respectively narrated that:

We have had a number of joint publications mostly within the department but also with other departments and colleges. In all these publications, the theme that has guided us is teamwork (APSP2).

We value teamwork because most of the research we are doing require some kind of joint effort. You may be an expert in road materials, when there is an issue to do with the environment, you need a chemist, and because of that, even when we are training our students and doing research, we emphasize teamwork. There is no way you can advance without joint effort. (APHA1)

The above responses reveal that various academic disciplines value the culture of interdisciplinarity and engage in interdisciplinary research. This means that it is possible for researchers from social science disciplines to cooperate with their counterparts from science domains. Working with people from other disciplines is perhaps seen as a way of: accessing expertise; cross fertilization of ideas; improving access to funds and instruments; obtaining
prestige or visibility; pooling knowledge for tackling large and complex problems; and enhancing knowledge production and innovation.

Institutional level senior research managers too gave the institutional perspective by disclosing that interdisciplinarity is highly valued at Makerere University. In this regard, RMIL1 corroborated that:

_The culture of doing research in teams is very important for the University. Even funders emphasize it. SIDA for example wants people to work in teams. Research done by a social scientist may be translated by a performing arts person through drama and everyone will understand. Teamwork is the only way you can put everyone on board._

The participant above reiterates the importance of interdisciplinarity across disciplinary fields. He also highlights that interdisciplinarity is a donor requirement. This again shows that academic research has been understood in terms of the donor-driven research orientation. Yet again, the desire to conform in order to secure legitimacy from the donors speaks to the relevance of the institutional theory in informing the research situation at Makerere University.

Pronouncements at the institutional level in support of the culture of interdisciplinarity are contained in several University research policies. For example, the Quality Assurance Policy Framework pronounces that cooperation between units will be promoted especially in sharing of (human) resources to optimise their usage (Makerere University, 2007). The Research and Innovations Policy encourages the formation of multidisciplinary teams at centres of excellence to ensure that through multidisciplinary research the volume of research increases; research becomes less project and individual based; and research uptake is enhanced (Makerere University, 2008, p. 4, 5). Nonetheless, some study participants expressed mixed feelings regarding the success of interdisciplinarity. They revealed that the links between academic disciplines are still weak because academic research is largely undertaken in disciplinary silos despite strategy pronouncement of interdisciplinarity in knowledge production. APHA2, an Associate Professor from the hard-applied field that is analogous to the entrepreneurial research orientation reported that although the University has moved towards the strategy of creating multi-disciplinary departments, formation of these departments is yet to take root. He also reported that the operationalisation of interdisciplinarity is a bit complicated:

_We have engaged in many projects where it is a multidisciplinary team. But many times, we go in as different scholars or different specialists and each one is tackling their area of specialty rather than multidisciplinarity because it is very complicated to make somebody for example from health sciences to appreciate aspects of agriculture. So coming to the real implementation of multidisciplinarity is very complicated._ (APHA2)

_Culture of building collaborations_  
The prime aim of establishing collaborations between academic institutions locally and internationally is the enrichment of educational opportunity and experience, although according to the Quality Assurance Policy Framework, the University also deems income generation as a valid reason for establishing collaborations (Makerere University, 2007). Collaboration entails building partnerships between friendly universities, development partners, donors, local communities, governments and research institutions locally and in other countries to create an enabling environment in which students and academics are willing to participate. The current strategic plan 2008/09-2018/19 spells out partnerships and
networking as the third area of strategic focus (Makerere University, 2008a). Makerere University has established collaborations and networks with public and private sector institutions and signed MoUs with both international and local partners. According to the Quality Assurance Policy Framework, the culture of building collaborations and partnerships would “promote mutual learning; strengthen collaboration through research sharing; and yield national and international visibility by excellence in research on global issues” (Makerere University, 2007, p. 44). However, a closer view of the type of collaborations and partnerships the University is involved in reveals a leaning towards those involving development partners, donors and foreign universities (mostly in the West) for academic exchange and for soliciting research funding. As such, collaborations with local partners and end users still remain low; an indicator that research uptake leaves a lot to be desired.

Premised on the above, building collaborations and partnerships is seen as a major institutional strategy for establishing a favourable environment for knowledge production at Makerere University. Since 2008 when the University embraced a research-led mission, it increased its participation in partnerships and collaborations key of which were those with the Swedish government (SIDA), the government of Norway (NORAD), the Rockefeller Foundation and Carnegie Corporation of New York, and the Bill & Melinda Gates Foundation among others. The University is also collaborating with regional universities through the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) and the Cross-Country Research Capacity Development Network (CARPREX). Nevertheless, more attention was paid to collaborations that enhance research funding and academic exchange. In agreement, Full Professors from the soft-pure and hard-applied fields revealed that:

We value collaborations and partnerships because we don’t have the money. Of course when the University research agenda, is bank rolled by development partners with whom we collaborate (FPSP).
We value collaborations and want to attract a lot of collaborators because there is no research funding in Uganda. So we somehow depend on collaboration. It is easier to get outside funding when you collaborate with others. If for example you are to get Swedish funding, you somehow establish a Swedish collaboration. If you are to get American funding you establish an American collaboration (FPHA).

Similarly, Associate Professors underlined the importance of building collaborations and partnerships. For instance, APHP2 from the hard-pure field (academic research orientation) said that:

The department values and encourages collaborations and at some point we did staff exchange. Two of us went to Sweden and stayed there for three months. While there, we shared an office with Swedes and taught some courses. A Swede is sitting in class. When the students are discussing, you also sit in class to learn and also the Swede comes here [Makerere University] to teach some of my courses while I am sitting in class. We learn from each other. New ideas come up as a result of collaborative research projects.

Another Associate Professor from the soft-applied field (APSA1) highlighted the importance of building international alliances in the course of doing University work by narrating that:
We value collaborations because that is where the resources are and because the work we do is determined by those we are collaborating with. For example, I am leading an IDRC project that is concerned with technical education. We are trying to do an economic analysis of technical and
vocational education, the impact after the project intervention. We are now more in that area because that is where the resources are (APSA1).

In a similar vein, institutional level senior research managers also shared that at the institutional level, the culture of building international collaborations and partnerships is highly valued. That is why, despite having some reservations, RMIL1 emphatically corroborated that:

International collaborations and partnerships are highly valued in Makerere University because through them we are able to attract donor funding and this has come in to help academic research. Almost ninety nine percent of research funding is coming from development partners. That is the sad part of research in this University.

As indicated by the above participants, it is clear that working with international partners is both inevitable and important across disciplinary fields at Makerere University. This is because it is a source of research funding since there are no internal funding mechanisms to drive knowledge production. It also seems that the popularity of this culture has been heightened by the significantly reduced financial support rendered by the government to the research arm of the University. Seen in this line, one is able to detect that: One, this culture is partially reenergized by the tendency to respond to a donor-driven orientation to research. Two, the culture of overly responding to the research interests of the development partners (donors) renders the locally generated research agenda somehow irrelevant as University research priorities become increasingly dictated by the development partners. Three, partnerships for co-production of knowledge with local and regional partners as key end-users of University research outputs are limited resulting into low levels of research uptake.

In spite of the flip side of the culture of building international networks and collaborations highlighted above, this culture is also associated with some benefits. For instance, as highlighted by APHP2, an Associate professor form the hard-pure field that is in sync with the academic research orientation above, building international alliances enhances staff exchange. Moreover, the degree to which researchers can create alliances and collaboration is contributory to their research productivity. Networking with academics from other universities is the hallmark of a research-led flagship University. Today's academic can no longer afford to isolate her/himself to his office or laboratory in a bid to understand her/his discipline better. Familiarizing oneself to the developments of the discipline and with peers around the globe is an attribute that adds luster to academic research.

Culture of engaging in applied research
Study participants across disciplinary fields acknowledged the importance of this culture by indicating that the hands-on approach (practicality) to doing University work has enabled them to produce knowledge with useful innovations and of practical value to society. Participants further shared that they somehow endeavour to engage research users in the course of knowledge production and that this enables them to produce knowledge with practical outcomes. Recurring in the accounts given by participants were voices that through engagement in practical, lead researchers across disciplinary fields value engagement in applied research. In this regard, FPHA and FPSA both Full Professors from hard-applied and soft-applied fields elaborated that:

We value practical in the Law school. Law Development Center (LDC) is purely practical. Much of the practical work is done terminally at the Law Development Centre although we have court moots which inculcate some practical aspects before going for the Bar course at LDC (FPSA).

Medicine is an applied science in which practicals are highly valued. Certainly this informs the way we do research. Much of the research we do is
hands-on. Of course at the back of every research we do in the school of medicine, we are looking for practical innovations. Can you come up with new knowledge, new ideas, something new that is going to be of practical value to society? Our practical orientation helps us to develop a culture that defines who we are (FPHA).

Away from Full Professors, Associate Professors too indicated that within their disparate academic disciplines, practicals are valued as well. For example APHP1 from the hard-pure field that corresponds with the academic research orientation said that:

Chemistry is practical oriented. There is no chemist that will be good when they are very poor at practicals. When I was starting on my research some time back, I had a problem of lack of equipment. This forced me to move to the medical school so that I can have access to the kind of equipment, facilities, and chemicals that I wanted. Where things are theoretical, I request those in the departments that have the equipment to allow my students get the right feel of the equipment.

Although APSP2 an Associate Professor from the soft-pure field that is parallel to the academic research orientation expressed some reservations, he as well made allusion to the inevitability of the hands-on approach to research. In his words:

Although the practical orientation is still deficient in our research, we highly value it. When we develop our proposals for funding, we are conscious of the presence of development partners. Development partners are demanding research which has practical aspects, research that can contribute to the world outside academics (APSP2).

From the above voices, variation between participants from the hard and soft fields regarding the extent to which practicality (hands-on approach) as a precursor to applied research has deepened in their disparate disciplinary fields can be discerned. Results show that whereas the practical orientation to research is highly valued across disciplinary fields, it is more entrenched in the hard disciplines (FPHA, APHP1) and still deficient and largely a response to the demands of development partners in the soft domains (APSP2). No wonder, researchers in hard-applied disciplines were found to be more involved in applied research relative to their counterparts in the soft domains.

Despite budgetary constraints, participants across disciplinary fields further conceded that the culture of engaging in applied research has been catalyzed by the value of dual engagement. It was in this spirit that FPSP noted that broadly speaking, his college identifies with society. The position shows in the following quotation:

In our college, we value engagement. But we also have the advantage that we are naturally more connected with political, social, and economic aspects of society. So in the course of doing our research, we do engage stakeholders.

The above participant clarified that in order to enhance uptake, knowledge users are somehow consulted in the course knowledge production. He also adds that this is something they do by default. Another key point implied in the above quote is that within soft fields, some knowledge that is produced is policy-relevant and community oriented. The ethos of the value of dual engagement was further illustrated by FPHP from the hard-pure field when he submitted that linking up with stakeholders in the course of knowledge production is their preferred direction:

The direction of our research is community oriented. Our research focuses on conservation of biodiversity, restoration of polluted habitats, and looking for
biological agents that can be helpful to human beings. Much of this research is community based. So I can say that in our discipline, we treasure research that engages communities.

APHA2, an Associate Professor from the hard-applied disciplinary field also shared that although engagement can be costly, it is the way to go:

Ideally, we should engage all stakeholders in problem identification to enhance uptake. Before you develop the project, you need to identify the other stakeholders, come together, think about the problem, and explain it together. But who is going to give you money for that? And you are not even sure whether your idea will go through or not. You are just writing a proposal which will either go through or not. So the pre-project kind of preparation is purely a cost on you as an individual.

Along similar lines, RMIL2 a senior research manager at the institutional level from the Directorate of Quality Assurance also added to the above findings by giving the institutional perspective regarding the value of engagement and linkages by disclosing that:

Although the University has declared its intention very openly and strongly as being a research-led University where issues of internationalization, quality assurance and gender main streaming are highly regarded, the element of engaging communities and therefore local utilization of research findings is not forgotten.

From the above foregoing, it is clear that lead researchers make unofficial efforts to engage end-users in the course of knowledge production so as to uphold the culture of engaging in applied research. As APSP2 observed above, many engage end-users when conditioned by funders. Moreover, even when they take such personal initiatives to engage, they are not significantly rewarded by the University incentive system. It is in this spirit that FPSP advised that in order to deepen engagement, “higher education Institutions should broaden the personal assessment model so that academics are assessed not only by publication but also according to societal contribution”.

Efforts to deepen the value of engagement so as to enhance research uptake have been reported at Makerere University. For instance, there are emerging centers of excellence in agriculture (plant breeding and bio-technology) and an Infectious Diseases Institute. There is also a new center of excellence in oncology, supported by the African Development Bank. According to the 2016 annual report, the University is expected to operationalize two centers of excellence to deliver relevant applied research to address key development challenges facing the region under the Eastern and Southern Africa Higher Education Centres of Excellence Project (ACE11). These are the Africa Centre of Excellence in Materials, Product Development and Nano Technology (MAPRONANO) in CEDAT and the Makerere University Regional Centre for Crop Improvement in CAES (Makerere University, 2016). Although these centres are yet to become fully operational, their creation was meant to deepen stakeholder engagement so as to enhance research uptake and sustained use of knowledge generated through applied research. Some colleges also established platforms to optimise knowledge application through societal engagement. For instance, the Africa Institute for Strategic Services and Development (AFRISA) platform in COVAB which contributes to developments in the animal value chain in Uganda and the Resilient Africa Network (RAN) which supports multidisciplinarity in innovation generation in the fields of agriculture, health, engineering to, among others, address community needs (Makerere University, 2016, 2015, 2014).
As can be seen above, such platforms are more pronounced in the hard-applied disciplines. Despite the fact that structural reforms in terms of creation of multi-disciplinary departments articulated in the current strategic plan (Makerere University, 2008a) are yet to take root even within these disciplines, it is appreciated that within the current University Strategic Plan; University annual reports; and some college strategic plans, the importance of applied research has been emphasized (Makerere University, 2008a; Makerere University, 2011, p.35; Makerere University, 2015a, p.13).

Culture of producing basic/fundamental knowledge

Across disciplinary fields, results show that the culture of producing basic knowledge is highly treasured. As such, one of the important markets to which Makerere University research results are principally directed is the scientific community (academic market). Within this market, University researchers from the different disciplinary fields have shown the tendency to comply with the professional norms and rules (normative isomorphism) of their respective disciplinary fields and their academic community. The existence and importance of this culture at Makerere University can be discerned from the accounts of Full Professors from the soft-applied, hard-applied and hard-pure fields:

*Obviously one can have an engagement and debate: to what end is research? And I think may be in some respect, the idea that research must necessarily influence policy in the public arena is also a debatable question. Research is really an expression of the university as a market place where ideas meet; contend for space and articulation and where people push those ideas in one direction or the other. I personally do not necessarily think that policy oriented research, even though that is the direction that is being emphasized should be given prominence. So the research that I am familiar with is basic research (FPSA). As a college, we value basic research because it is used to underpin application and innovations. For you to do a meaningful applied research, you need what is called the basic research. Basic research is based on theory and it is actually the foundation of knowledge. It is this knowledge that may need to be applied. So if research is only geared towards application and is not based on basic knowledge, it will run short of ideas and after some time, it will become irrelevant because it is not anchored in the very basics of knowledge (FPHA). As a plant physiologist, I value basic knowledge because it enables me to know all the basics about plant functions. Generating structured knowledge at the very basic level makes me a better plant physiologist. So we encourage a lot of basic research. Unless you know the basics, you cannot do the advanced research (FPHP).*

The above voices reflect that the production of knowledge at the very basic level is highly cherished as this allows academic freedom (FPSA). Basic research also helps to: underpin applied research (FPHA, FPHP), generate new theories (FPSA, FPHA), and understand the nature of things (FPHA). In agreement with Mwiandi (2010), lead researchers at Makerere University have come to realise that as they conduct applied research to address the present problems, there is need to pay attention to innovation and research for tomorrow (basic research) since future development (as shared by RMIL2) rely on the basic research conducted through the university but which may not necessarily provide answers for present
problems. A similar view was held by Associate Professors as described in the following quotes:

*I value basic research because it goes down to the root of knowledge, the root of technology, the root of science, the root of humanity, and where they come from and give recommendation for what would be required for the world now. The only difference is that it goes short of telling you do ABC but it shows the trend, and direction (APSP1).*

*In the school of distance learning, we value basic knowledge. We generate basic knowledge when we get involved in basic research. Basic research helps us to generate theories that underpin application. And that is very important because if you don’t have theories to underpin application, then you make applications that are not standardized, applications that are not fit for purpose. So that research is just for frameworks. For example, frameworks for distance learning (APSA2).*

Institutional level senior research managers too shared that Makerere University values basic research as is seen in the following excerpt:

*As an institution, we value basic research because it enables us to extend the frontiers of knowledge and to get theories that inform application. This is research that is not going to be immediately translated. It is not yearning for translation but it is available and it stays on the shelf for quite some time. It provides the basis for applied research. Researchers who found the atom did not know that it will have use. But then later on, it was used in atomic bombs (RML2).*

Issuing from the above, it is clear that a lot of importance is attached to the culture of conducting basic research. RML2’s quote above highlights an interesting point about how basic research, which may not have been relevant at the time it was undertaken may become relevant after many years. Complementary information obtained from the perusal of documents revealed that the University Research Agenda (2013-2018) (Makerere University, 2013a) considers basic research a major area of strategic focus. Furthermore, the Research and Innovation Policy (2008) equally pronounces support for basic research alongside applied research, teaching, and outreach within the portfolio of University activities (Makerere University, 2008b, p. 5). Within college strategic plans and annual reports, the importance of basic research has also been emphasized. For instance, the strategic plan for the College of Agriculture and Environmental Sciences (CAES) points out that one of the key performance indicators is availing resources for engagement in basic research (Makerere University, 2011, p.35). Similarly, according to the 2016 College of Natural Sciences Annual Report, various departments in the College continue to undertake research that is intended to, among others, extending knowledge frontiers (Makerere University, 2016a, p.15). As such, Makerere University has uniquely positioned herself among universities in Uganda and continues with her quest to become a research led institution by advancing, among others, basic research (Makerere University, 2016; 2015a).

However, the above notwithstanding, development partners and major donors tend to down play the potential benefits of basic research and as such attach less value to it. The argument normally given is that basic research is discipline focused and that it is normally carried out in contexts that are largely governed by academic interests of specific academic communities (Gibbons et al., 1994). As such, it seldom involves the coming together of academic and non-academic partners. In addition, because topics in basic research focus on extending knowledge frontiers in particular disciplines, its societal accountability tends to be limited. This quality implies that basic research remains underrated and less funded. It is therefore
important for the University to increase its funding of basic research. Otherwise, leaving this to the market mechanism, which largely prefers applied research, would be a dangerous move.

**Discussion**

We explored participants’ conceptions of disciplinary cultures across disciplinary fields at Makerere University. The study found that at Makerere University four disciplinary cultures are dominant. These are the cultures of interdisciplinarity; building collaborations and partnerships; engaging in applied research; and producing knowledge at the very basic level. Although variation regarding the extent to which each of these cultures has been entrenched across disciplinary fields was evident, no single disciplinary culture was found mutually exclusive to a particular disciplinary field; rather, all the cultures existed in all the fields. The above result suggests that earlier findings on the nature of knowledge, disciplinary fields, disciplinary identity, and disciplinary cultures need to be revisited. For instance, whereas these studies (Biglan, 1973; Becher 1987; Becher, 1989; Becher, 1990; Becher, 1994, and Becher and Trowler, 2001) held that pure disciplines (such as botany and philosophy) are irrevocably fixed to the values of mode 1 science i.e. disengagement; academic freedom; and producing theoretical knowledge to achieve career growth and recognition within the scientific community, this study indicates that at Makerere University, pure disciplines are engaged in the production of mode 2 science as well i.e. community-oriented and policy-relevant knowledge (applied research). Similarly, applied fields (such as engineering and economics) that were presumed to be more inclined to some practical end and to the provision of functional knowledge with an aim of improving professional practice were found to be engaged in the production of basic research.

From the above, it can be seen that the rigid relationship between disciplinary fields and disciplinary cultures that was suggested by earlier studies does not hold in the context of Makerere University. Particularly, these findings negate Biglan’s (1973a; 1973b), Becher (1987; 1989), and Becher & Trowler’s characterizations which showed that: one, disciplinary cultures are stable and that membership of academics to disciplinary fields within universities affords them stable and lawful identities; and two, that scholars in pure fields are inside looking yet those in applied domains are outward looking and engaged more in collaborations compared to those in the pure disciplines. However, these findings reinforce the postmodernists’ view (Hall, 1992; Bauman, 1996) that stable disciplinary cultures and identities as suggested by Biglan and Becher are a deception and that cultural identities should be viewed as fluid and transitory. By recognizing that forces from the institutional environment condition University researchers to negotiate between institutional pressures and the preservation of disciplinary identity, the findings support the institutional theory. At Makerere University, pressures from the institutional environment (scientific community and development partners) have conditioned academic researchers to engage in scientific publications and interdisciplinary research across disciplinary fields and this is increasingly making academic boundaries blurred. This finding supports Gibbons et al’s (1994) argument that with globalisation and its associated “new” forms of knowledge production, disciplinary boundaries are becoming blurred and permeable.

**The culture of interdisciplinarity**

In line with Wernli & Darbellay (2016) who held that interdisciplinarity is driven by powerful scientific and societal needs, this study advances that the culture of interdisciplinarity at Makerere University emerged as a result of the need to contend with global, regional, national and societal forces. As a result of the above context of a growing instrumentalisation of
knowledge, partially occasioned by the advent of the knowledge society, the culture of interdisciplinarity has progressively gained traction as a mode of knowledge production at Makerere University. This is evident in participants’ responses and the institutional policies and strategies that pronounced interdisciplinary, multidisciplinary and transdisciplinary co-production of knowledge alongside discipline based research. Policy declarations revealed by documentary reviews and the narrations given by study participants indicate institutional support for partnerships in interdisciplinary, multidisciplinary and transdisciplinary research. Specifically, the Makerere University Strategic Plan 2008/9-2018/19 (Makerere University, 2008a), the Makerere University Research and Innovations Policy (Makerere University, 2008b) and the Makerere University Research Agenda (Makerere University, 2013a) have made this clear.

In academic discourse, interdisciplinarity typically applies to four realms: Knowledge, education, theory and research (Nissani, 1995). Specific to the latter, interdisciplinary research involves the integration of tools, methods and theories from various disciplines to answer a question, solve a problem, or address a topic that is too broad or complex to be dealt with adequately by a single discipline or profession (Klein & Newell, 1997). By working jointly on a shared research topic, and in a coordinated and interactive fashion, researchers from diverse disciplines integrate disciplinary insights, each drawing from their own disciplinary perspective to address a common problem (Wernil & Darbellay, 2016). A growing body of evidence confirms that interdisciplinary knowledge is more relevant, accessible, yields greater benefits to society and maximizes the impacts of research beyond the academy (Anderson & McLachan, 2015; Phipps, Cummings, Pepler, Wendy, and Cardina, 2016; Nissani, 1997; and Morton, 2015). Specifically, it has been established in research that interdisciplinarity is the panacea to many intellectual, social, and practical problems and serves to remind us of the unity of knowledge, helps us to mobilise the enormous intellectual resources in the cause of greater social rationality and justice, and that interdisciplinarians enjoy greater flexibility in their research.

In view of the benefits of interdisciplinarity highlighted above, Makerere University embraced it through a series of interventions that came in form of strategic plans, research related policies, and institutional strategies. Key of these interventions was the 2008/2009 - 2018/2019 Makerere University Strategic Plan that realigned the future of the University towards: a learner centred problem-based instruction that provides experiential and flexible learning; a research-driven University where research, teaching and learning are mutually reinforcing; and knowledge transfer partnerships and networking (Makerere University 2008a). Then came the University Research Agenda and the creation of Centres of Excellence and platforms of engagement and multidisciplinary departments as major institutional strategies to support the co-production of knowledge. Two related aspects of the University Research Agenda ran parallel. The first aimed to transform the academic organisational structure, curriculum and research, so as to address concerns about relevance and responsiveness to societal needs. The second aspect aimed to open up the University, making it more permeable in order to facilitate continuous contact with its external environment. These thrusts had the potential to transform the University. Interdisciplinarity suited the realization of both, through interdisciplinary research and interdisciplinary academic programmes.

Although Makerere University embraced interdisciplinarity as a response to pressing societal problems, its operationalisation still remains complicated because many researchers are still inextricably attached to their disciplines as alluded to by APHA2, an Associate Professor
from the hard-applied field that: “We have engaged in many projects where it is a multidisciplinary team. But many times, you go in just as different scholars or different specialists and each one is tackling their area of specialty rather than interdisciplinarity”. It has also been pointed out that interdisciplinarity is majorly used as a tool to access research funds from donors. All in all, despite the above challenges to the effective operationalisation of interdisciplinarity at Makerere University, it is apparent that University scientists have come to appreciate that interdisciplinarity supports the application of scholarship to local problems and that it is a harbinger of major shifts in the nature of academic research on a global scale.

The culture of building collaborations
This study holds that for higher education institutions to secure their positions and legitimacy they must collaborate with local and international partners to enable them build leverage for, among others, research support. Consistent with the above postulation, the University has, through collaborations with both local and international partners, made significant advances in knowledge production accounting for about 80% of the country’s total research outputs although a bigger share of this knowledge is produced by science based disciplines (Kasozi, 2016, p. 15). According to study participants and research related policies (such as the Research and Innovations Policy), building collaborations and partnerships is one of the institutional strategies to support the production of relevant and impactful knowledge at Makerere University. This is in agreement with Wah, Kwan, Kabir, Koh & Sinnasamy (2014) who stressed that research collaboration is the way to go in order to improve quality and impact of research findings. Bennet & Jessani (2011) also stressed that production of relevant knowledge relies on partnerships, collaboration and personal contacts between researchers and end users. Nevertheless, a closer look at the sort of collaborations that the University is engaged in indicates a bias towards those with donors and key international development partners. Research collaborations with local partners are not as prominent at Makerere University. This supports Adams’ (2013) contention that we are entering the age of research driven by international collaboration, and that high education institutions that do not form international collaborations risk progressive alienation and are likely to lose out entirely.

Study participants reported having realized a number of benefits as a result of engaging in international collaborations such as: increase in the number of publications which yield more international recognition of researchers, acquiring additional research funding and institutional rewards such as promotion, enhancing academic staff exchange, and earning extra income in form of per diem and off pocket upon being invited for international conferences. This confirms findings by Katz & Martin (1997) who stressed that international research collaborations are generally presumed to be valuable and useful, particularly by policy makers. Barjak & Robinson’s (2007) study demonstrated positive impacts from international collaboration on the quantity and quality research. Related studies highlighted increase in international co-authorship in scientific publications (Wah et al., 2014); increase in the number of high impact publications in high impact scientific journals (Levitt & Thelwall, 2009); and increase in the number of citations compared to domestic or national co-authored publications (Hsu and Huang, 2010; Narin & Whitlow, 1990).

However, the current study found out that at Makerere University soliciting research funding and enhancing academic exchange are the main drivers of the existing international collaborations and partnerships. This coheres with Openjuru (2015) and Mugabi’s (2014) finding that collaborations and partnerships at Makerere University essentially aim at soliciting research funding and seldom involve local stakeholders such as government,
industrialists, policy makers, and civil society in the research process. As such, engagement of local partners by University researchers remains shallow and superficially done both at the level of problem identification and during research dissemination conferences and workshops and this makes it difficult to establish lasting partnerships with end-users. This has, to a reasonable degree, impaired the researchers’ ability to effectively identify policy-relevant and community-oriented research problems.

It has been suggested that one of the drawbacks of international collaborative research is that it obstructs junior researchers’ career advancement, as their contribution to research done with an established researcher may be underrated (Chikoore, 2016 p.237). This notion did not surface in the findings of this study. However, although participants revealed that when they collaborate with international partners, they retain some professional autonomy regarding the methods they use to tackle research problems, they as well shared that international collaborative research erodes their academic autonomy because donors retain decision rights over the projects they take on. Another noticeable limitation of international research collaborations and partnerships in HE research has been their focus on academic impact at the expense of broader research impact. This practice has been heightened by the fact that published research can be easily traced and attributed to authors through citation yet attribution of broader impact has been found to be difficult due to complex set of interactions between multiple institutions and stakeholders (Donovan, 2011, Oanacea, 2013a). Assessing the broader impact of research requires a thorough understanding of the local context of research which international partners may not be well versed with making impact assessment difficult (Morton, 2015).

Issuing from the above, we contend that in order to optimise the benefits from research collaborations and partnerships, academic researchers at Makerere University need to concede that knowledge production must be done in consultation with local end-users. They must recognize that the concept of knowledge production has entered the realm of social constructivism which, according to Bogelund (2015), implies that knowledge is no longer true per se; it is a product created through a reassuring process where academic scientists are altering from being discipline-centered producers of knowledge to those where several actors cooperate to create value. They must admit that the research funding landscape is changing and that “whether scientists like it or not, the societal impact of their research is an increasingly important factor in attracting public funding and support for basic research” (Bornmann, 2012 p. 676). Kirigia, Pannenborg, Amore, Ghannem, IJsselmuiden & Nabyoga-Orem (2016) have advanced that deepening of researchers’ engagement with end-users may require, among others: establishing consultative links between knowledge producers and end-users (interaction), presenting research results to potential users (dissemination), using influential experts to persuade users of the value of a study (social influence), offering necessary technical, financial, organizational and emotional support to improve the use of research (facilitation), and rewarding knowledge translation efforts (incentives and reinforcement). However, the above strategies should not be seen as mutually exclusive; rather, they complement one another and interact in complex ways (Barwick, Phipps, Myers, Johnny & Coriandoli (2014).

The culture of producing basic knowledge
Results showed that the production of knowledge at the very basic level is valued across academic disciplines at Makerere University. Participants shared that the popularity of this cultures derives from reasons such as: basic research is an autonomous pursuit, free of interference by sponsors (academic freedom); basic research helps to generate new
knowledge and to extend the frontiers of knowledge; basic research underlies all other forms of research; basic research enhances one’s recognition within the scientific community; one’s career prospects are based on basic research via publication in refereed journals as well as monographs; and that basic research underpins application and innovations.

The above findings have been supported by Hakala & Ylijoki (2001) who held that: the main audience to whom basic researchers address their results is the scientific community; basic research reflects traditional academic values and norms, such as academic freedom and a curiosity-driven choice of research topics; and that researchers’ main motive in their work is to achieve recognition within the scientific community. The findings also uphold Karagianis’ (2014) and Henard & McFadyen’s (2005) contention that basic research is a spark that creates new knowledge, solves big problems, supports applications and that institutions that engage in higher levels of applied research will see enhanced performance returns from additional investment in basic research. This may suggest that basic research initiatives broaden an institution’s stored knowledge which enhances future applied research performance. Seen in this light, engagement in basic research can be justified if it is viewed as complementing the relationship between applied research and performance returns (Henard & McFadyen, 2005).

Because of the above benefits, basic research has traditionally been fundamental to university missions (Bentley, Gulbrandsen, & Kyvik, 2015). No wonder the 2013 – 2018 Makerere University Research Agenda considers basic research as one of the areas of strategic focus (Makerere University, 2013a). In addition to applied research and outreach, basic research is a major pillar in ensuring efficient creation of knowledge at Makerere University (Makerere University, 2008b). The Makerere University Research and Innovations Policy also recognises that within the portfolio of university activities, basic and applied research “should be appropriately balanced to ensure efficient creation of knowledge and its transfer” (p. 5). Thus, although basic scientists are vulnerable to donor demands that manifest in the form mode 2 Science, generally this study shows that a big segment of academia at Makerere University has maintained a discipline centered approach to knowledge production. This finding negates those of scholars like Slaughter and Leslie (1997), Etzkowitz et al (2000), and Smith-Doerr & Vardi (2015) that the rise of the entrepreneurial university and therefore mode 2 Science has fundamentally reframed the role of academia in society from ivory towers to engines of economic growth. The contention that the rise of mode 2 science has completely eroded basic researchers’ autonomy in favor of heteronomous knowledge production mechanisms that are subject to multiple accountabilities does not entirely hold for Makerere University.

The current study further established that the institutional strategy (i.e., ensuring that there is an appropriate balance between basic and applied research and that the two complement each other to optimize the University’s contribution to society) is not only endorsed in rhetoric, it is largely postulated, undemonstrated and not synced with disciplinary practices of knowledge creation. There appears to be an independent relationship between basic and applied research making it difficult to justify investment in basic research. What is more, knowledge production predominantly takes place within disciplinary silos and as such, it is biased towards the production of journal articles and publications. This bias could be attributed to the existing incentive system that has conditioned academic researchers to devote their efforts to publishing in peer reviewed journals to earn promotion, salary increment and recognition within the scientific community.
The current study has established that development partners tend to downplay the potential benefits of basic research because of its focus on traditional research outputs (such as publications in refereed journals, conference papers, theses, dissertations, monographs, books and book chapters) that rarely complement applied research, limit interdisciplinary research collaborations, and de-emphasise stakeholder engagement. The above findings are in consonance with Isobell, Lazarus, Suffla, & Seedat’s (2016) observation that failure to transcend disciplinary boundaries in knowledge production constrains opportunities to benefit from the input of end-users which limits non-academic uptake and use of research in policy and practice. As discussed in sub-section 5.1.1.2 above, the limitations of basic research that manifest in traditional research outputs could be overcome by ensuring that knowledge produced therein is summarized, contextualized, and transformed so that it is presented to policy makers and practitioners in a manner that is comprehensible (Gagnon, 2016). As earlier observed, this could be done through tools like policy briefs, newsletters, policy advice, posters, magazines, stickers, booklets and technical reports.

Conclusion
The study also sought to explore the existing disciplinary cultures at Makerere University. This was against the background that if research orientations are to be fully understood, they should be viewed through the lenses of the underlying disciplinary ethos that infuse scholarly effort and productivity (Puplampu, 2015). The study concluded that four disciplinary cultures dominantly exist at Makerere University: interdisciplinarity, engaging in collaborations, engaging in applied research, and producing basic knowledge. Despite variation regarding the deepening of the above cultures within various academic disciplines, their ubiquity in all disciplinary fields is evident. Indeed, no particular culture was found to be mutually exclusive to a single disciplinary field. This conclusion negates Biglan (1973) and Becher’s (1994) earlier finding that disciplinary cultures are stable and that membership of academics to disciplinary fields within universities affords them stable and lawful identities. The conclusion however supports the views of postmodernist scholars, Hall (1992) and Bauman (1996) who argued that stable disciplinary cultures and identities as suggested by Biglan (1973) are a deception and that given the changing high education terrain, cultural identities should be viewed as fluid and transitory.

Finally, it was concluded that at Makerere University, disciplinary cultures are transforming and that dominant disciplinary cultures inform the research direction of the University. There was indication of the existence of interdisciplinary research and that the choice of research topics is increasingly being shaped by the research team and those that the University is collaborating with. Likewise, the culture of engaging in applied research was found to be a major driver of research that is carried out in the context of application especially in applied sciences such as engineering and medicine. The production of traditional research outputs such as publications in peer-reviewed journals, books, and book chapters partly derives from the culture of producing knowledge at the very basic level.

Implications for further research
This study recognizes that disciplinary cultures and identities are transforming because of forces affecting the structure of higher education both from within and without the academe. The causes, sources, and effects of the transforming disciplinary cultures on higher education research have not been exhaustively handled in this study. Another extension of this study would be to explore these elements.
Limitations of the study
Findings generated using a social constructivist philosophy, an interpretivism paradigm, an intrinsic case study design, and qualitative methods are exclusive to the institution studied and not easily generalizable, nor automatically transferable to other institutions that intend to understand their disciplinary cultures. It, therefore, appears that the readers of this work will have to decide regarding transferability. Not only that, some of the data that was collected from disciplinary fields alludes to culture which is a very unique aspect to generalise. The study was limited to one University, Makerere University. A broader geographic sampling would provide a better picture of disciplinary cultures in higher education in the different Universities. Further research is required across a wider geographical area. Finally, all the interview participants were male lead researchers and institutional-level senior research managers which could mean that their views are not representative of the female academics and female research managers.

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