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The use of activity theory and its principle of contradictions to identify and analyse systemic tensions: the case of a Virtual University and its partners

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Abstract

When it comes to understanding the dynamics of interaction between humans and technology, activity theory's principle of contradiction is very useful. This is because contradictions expose links between humans and technology. These links are in form of problems, ruptures, breakdowns, clashes, distortions and so on. In this paper, we used activity theory's principle of contradiction to analyze reported cases of the partnership of African Virtual University (AVU) and two Australian universities. Our analysis of the reported cases reveals contradictions between AVU and its principles, partners, students, lecturers, the African community and so on. We concluded with the implications of these contradictions with regards to change in the AVU practice.

Keywords

Activity theory, contradiction, African virtual university, ICT and partnership

1. Introduction

Human activities cannot be understood or analysed independent of the contexts in which they occur. This is one of several arguments poised by activity theory. As a fundamental rule, activity theory purports that analysing human activity should not only involve the kinds of activities that people engage in but also who is engaging in the activity, what their goals and intentions are, what objects or products result from the activity, the rules and norms that define the activity, and the larger community in which the activity is taking place (Jonassen & Rohrer-Murphy, 1999). In the context of learning, activity theory and its principle of contradiction can draw researchers' attention to important factors to consider when analysing teaching and learning activity.

The lens of activity theory provides a versatile tool to inquire into various aspects of the use of Information and Communications Technology (ICT) in higher education, taking into account individual and institutional perspectives as well as evolution over time. According to Kaptelinin (1996), activity theory is useful as a lens to analyse activities of an organisation that involve the use of computers since computers can be regarded as a tool mediating the

interaction of humans with their environment. Benson et al. (2008) also argued that activity theory exposes the interface between the macro (strategy, policy, campus-wide solutions) and the micro-organisational levels (everyday working practice, iterative change, individual adaption, etc.) with regards to e-learning (the use of ICT in higher education). Typically, activity theory draws attention to the dialectical process by which consciousness, learning and development simultaneously shape and are shaped by technology (e.g. ICT).

When it comes to understanding the dynamics of interaction between humans and non-human, activity theory's principle of contradiction is key. Contradictions are historically accumulating structural tensions within and between activity systems (Blin & Munro, 2007). They often manifest themselves as problems, ruptures, breakdowns, clashes or as disturbances, which interrupt the flow of work. Studying the emergence of contradictions and the way they are (un-)resolved in activity theory allows us to gain explanatory insights into phenomena of resistance to educational innovations and barriers to pedagogical transformation resulting from the introduction of technology (Blin & Munroe, 2007). Moreover, contradictions are not only related to conflicts or problems but are also agents of change and perhaps innovation-producing machines. According to Engström (2001), contradictions are increasingly being regarded as fuels for change and development within activity systems. Consequently, they have started to gain "due status as a guiding principle of empirical research" (p. 135).

This paper explores activity theory and how its principle of contradictions can help guide studies on virtual universities or simply put studies relating to the use of ICT in higher education. The paper commences with an overview of activity theory and its principle of contradictions, followed by a brief review of case studies relating to the African Virtual University (AVU) partnership model with two of their international partners – Royal Melbourne Institute of Technology (Kigotho, 2006) and Curtin University (Graber & Bolt, 2011). The analysis of the AVU partnership model is thereafter carried out. We conclude by reviewing the implications of contradictions as a research tool with specific focus on the use of ICT in virtual higher education using the cases.

2. Overview of Activity Theory

Activity theory is a framework that helps to understand the relationship of humans and tools, with other influences within a social setting. It advocates the historical development of ideas as well as the active and constructive role of humans as evidenced in the works of early researchers of psychology such as Sergei Rubinshtein (1935) and Alexei Leont'ev (1947). The likes of Lev Vygotsky (1979), Marx Wartofsky (1979), Engström (1999) and their associates have also contributed immensely to the development of the theory.

Activity theory holds that "activities are collective and motivated by the need to transform an object, which can be material or ideal (e.g. a problem or idea), into desired outcomes" (Blin & Munroe, 2007). It can best be explained in terms of the relationship between its key terms, such as: object, mediation, subject, tool, rules, community, and division of labour (see figure 1) Engström (1999). Because human activity is enmeshed in a network of social relations working together, all the factors/elements are jointly referred to as the activity system.

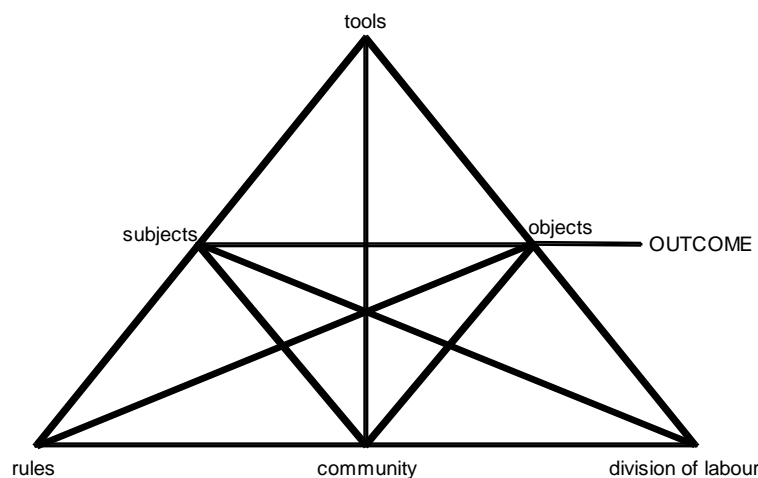
An activity system is an object-oriented, artifact-mediated and socially-constructed system, where cognition, behaviour and motivation are integrated and organised by a mechanism of self-regulation towards achieving a deliberate goal (Bedny & Karwowski 2004). Activities are complex, collective and motivated by the need to transform a material or abstract object into desired outcomes (Blin & Munroe, 2007) – e.g., transforming wax into candles or basically learning through ICT. The underlying motive of an activity system guides the

actions or series of actions which are carried out by the subjects (individual or groups) directed towards particular or finite goals (Blin & Munroe, 2007).

2.1 The Activity Theory Model (Engström, 1999)

The activity theory model relates activity as a collective and multi-voiced endeavour, taking into consideration multiple points of view, traditions, interests and interactions between participants. The model also emphasizes the mediation between the elements of activity within the system. According to Mwanza and Engström (2005), mediation represents the nature of relationships existing within and between participants of an activity in a given community. In other words, the relationship between subject and object is mediated by tools; the relationship between the subject and community are mediated by rules; and the relationship between object and community is mediated by the division of labour.

Figure 1: The activity theory model (Engström, 1999)



There are three main elements in the uppermost triangle: subjects, objects and tools. The subjects are the individual or group of actors engaging in conscious actions or chains of operations related to or embedded in the goals of the system (Bedny & Karwowski, 2004; Jonassen & Rohrer-Murphy, 1999). The objects represent the target of the activity within the system. In other words, the objects are the physical or mental products that are sought after – the intention that motivates the activity (Jonassen & Rohrer-Murphy, 1999). Tools are the mediating artifacts that help to achieve the outcomes of the activity; tools alter the activity and are, in turn, altered by the activity.

Rules are explicit and implicit regulations, norms and conventions that inherently guide or constrain actions and interactions within the activity system (Jonassen & Rohrer-Murphy, 1999). Community entails the individual or group of individuals who share the object with the subject (Bedny & Karwowski 2004). That is, community is the social and cultural context of the environment embedding the activity system (Mwanza, 2001). Division of labour represents the allocation of responsibilities and variations in job roles of the subjects as they carry out the activity in the community (Mwanza, 2001). It describes how tasks are divided horizontally between community members as well as referring to any vertical division of power and status (Bedny & Karwowski 2004). Finally, the outcome is the desired result of the activity of a system.

One of the compliments of activity theory lies in the fact that it offers a broad lens of inquiry that encompasses various aspects of the educational setting such as students' and teachers' backgrounds and perspectives, the whole institutional setting, and the evolution of the activity system over a period of time (Murphy & Rodriguez-Manzanares, 2008). In the context of this paper, the subjects are the AVU, its students and international partner institutions – Curtin University and Royal Melbourne Institute of Technology (RMIT); the object follows all the objectives of the AVU which is mainly to effectively utilize ICT as a means to enrol more students in higher education in the Sub-Saharan African region which has the lowest tertiary enrolment rate in the world. The tool mediating between the subjects and the object is the ICT available for teaching and learning. The student belongs to a community of fellow students (classmates), teachers, school administrators; and the whole community is mediated by rules and regulations guiding the delivery of virtual higher education. Rules for students include attending to class notes and the Learning Management System punctually and regularly; availability for real-time video conference scheduled classes; other disciplinary rules are specific to virtual classroom practice and etiquette. Rules for AVU and its partner institutions are lined up in the AVU charter. For division of labour, teachers from partnering institutions mediate activities via the virtual platform by; facilitating learning by ensuring students engage in online forums, discussion boards and videoconference classes; and also give all necessary support to students when needed. Moreover students are expected to be disciplined to their time tables, learning and engaging in various class activities using platforms available to them.

2.2 The principle of Contradiction

Contradictions are historically accumulating structural tensions within and between activity systems consequently causing a change (breakdown or development) in people's activities or themselves (Blin & Munro, 2007). By their nature, they often cause a sort of imbalance to the original activity and have the potential for instigating a change process. Contradictions are inevitable in the functioning of any activity system because they serve as useful sources for expansive developmental transformations (Igira & Aanestad, 2009). They are very important in the study of social settings because of the way they result in change and development. In fact, Engström and Meittinen (1999) described contradictions as “the motive force of change and development” (p. 9). The ways they bring about change in a setting vary depending on the contexts. In some contexts, they appear as tensions (Barab, Schatz, & Scheckler, 2004); in others, as breakdowns, conflicts or clashes between people, their cultures, practice or beliefs (Basharina, 2007; Demiraslan & Usluel, 2008); dilemmas; discoordinations (Roth, 2004). Studies of contradictions within an educational setting suggest that contradictions are often dressed in forms of limited tools and infrastructure, training of teachers, misalignment of academic calendars, culturally inappropriate pedagogical models, academic socialization, technological access, methods of learning accreditation and diversity in backgrounds, cultures, values and beliefs of students (Basharina, 2007; Demiraslan & Usluel, 2008; Hu & Webb, 2009; Lim & Hang, 2003; Murphy & Rodriguez-Manzanares, 2008).

There are four principal levels of contradictions according to Engeström (1987): primary, secondary, tertiary, and quaternary. Primary contradictions describe what are referred to as 'inner contradictions'. These types of contradictions occur within each constituent element of the central activity system. For example, within the subject of an activity system; say a disagreement in practice of students as a result of differences in their backgrounds, cultures or beliefs. Secondly, there is also the secondary level of contradictions. These types of contradictions are seen between the constituent elements of the central activity system. For instance, Demiraslan & Usluen (2008) identified contradictions between subjects and

division of labour within a school setting with regards to ICT integration; a teacher was willing to use ICT in her teaching and even make use of various technologies in her courses, but finds the support of school administration rather insufficient. It is noteworthy that both the primary and secondary levels of contradictions exist within a single activity system.

Thirdly, we have the tertiary level. Contradictions in this case, appear between the dominant form of a central activity and an introduced culturally more advanced form of the central activity; in other words, tertiary contradictions juxtapose the object of the dominant form of activity with the object of a culturally more advanced activity (Roth, 2004). Lastly is the quaternary level of contradictions. They are seen between the central activity and its neighbour activities within its network relations; in other words, quaternary contradictions exist between each entity of the dominant activity and the entity-producing neighbouring activity. Both the tertiary and quaternary levels of contradictions usually occur between activity systems (Roth, 2004). In this paper, we are mainly concerned with the analysis of the first two levels of contradictions. In other words, we did not look into the analysis of contradictions between two different activity systems.

Using activity theory's principle of contradiction as the framework for analysis, provides important insights into Africa's largest virtual university; its challenges, prospects and milestones. First, it provides a conceptual mapping to the intimate mesh or mechanism of the activity system (African Virtual University) and its context specific systemic tensions towards achieving its goals as an online university. Second, it helps to see activity systems beyond just one system but also the links with other systems without which it cannot function effectively; these other systems must be taken into account simultaneously as constituents of the activity system during analysis. Lastly, institutionalized activities are driven by something more robust and enduring than an individual goal-directed activity, making analysis less challenging (Lim & Hang, 2003).

3. The case study

The African Virtual University (AVU) is the largest online university initiative in Africa. It is an intergovernmental initiative with the quest to increase access to quality higher education through the use of ICT; that is, technological mode of instructional delivery (Ondari-Okemwa, 2002). The governments of countries such as Kenya, Mali, Senegal, Ivory Coast and Mauritania signed the charter that birthed the initiative. Initially launched in Washington in 1997 as a World Bank project, the AVU has its headquarters in Nairobi, Kenya and a Regional office in Dakar Senegal. According to the AVU website, AVU is the leading Pan African eLearning Network, and has acquired the largest eLearning network in Anglophone, Francophone and Lusophone Africa with more than 53 Partner Institutions in 27 countries. The AVU not only have partner institutions within Africa, their reach extends beyond the borders of Africa to institutions in other parts of the world including the United Kingdom, Australia, Canada, USA and so on towards their vision to increase access to quality higher education in Africa (Graber & Bolt, 2011).

Having successfully graduated over 40,000 students across Africa since 1997, the AVU initiative can be said to be achieving its goal, though slowly but visibly. The institution prides itself in some of its experiences since it began in 1997, which includes (African Virtual University, 2011):

- Delivering programs through information and communication Technologies (Degree Programs, Certificate and Diploma Programs)
- Building and managing large consortia of African Educational Institutions
- Designing and implementing Multinational eLearning Projects

- Developing African-based residential and eLearning materials for Partner Institutions
- Establishment of state of art e-learning centers in Partner Institutions
- Training of Partner Institutions staff in eLearning methodologies
- Developing and implementing Open Education Resources (OER) strategy
- Managing a digital Library

The principal objectives of the university include:

- To improve quality and relevance of science, engineering and business instructions in Sub-Saharan Africa;
- To significantly expand enrolment levels in areas of science, engineering and business in Sub-Saharan Africa;
- To support and encourage African Universities in developing, on a competitive basis, curricula that could be broadcast to other African countries.

The staff strength of the AVU is its consultants worldwide that help with content design, learning management system support, teaching and so on. As a virtual university, their capacity to employ full time staffs is limited so they only make do with a few of them. As a result, the AVU have strategic partners all over the world. In the school's charter, 'strategic partners' were defined as, "donors, institutions, corporations, companies, organisations, persons from public and private sectors and/or academia selected on the basis of their competence, qualification, integrity and willingness to serve for the good of the AVU and to mobilize and raise funds for the purposes of the AVU" (AVU Charter, 2010, p. 3).

Three phases of development were earmarked for the AVU. The first phase; the prototype services phase, started in June 1997 through to the end of 1998. This phase witnessed partnership with institutions of higher education throughout Sub-Saharan Africa (Graber & Bolt, 2011; Kigotho, 2006; Ondari-Okemwa, 2002). The second phase witnessed the establishment of partnership with institutions outside of Africa to help broadcast AVU courses worldwide. In Australia, the Royal Melbourne Institute of Technology (RMIT) agreed to deliver computer science programmes and Curtin University (Curtin) agreed to deliver business courses (Graber & Bolt, 2011). For Curtin University, delivery of the AVU business courses began in 2004 and was scheduled for completion in 2007. However, the delivery of distance degree and diploma courses met with various challenges. Moreover, these challenges were not only witnessed in the Curtin University partnership; come year 2006, RMIT withdrew from the partnership because of the AVU's failure to meet its financial commitments (Graber & Bolt, 2011). While there are several challenges faced with the delivery of the AVU courses, in this paper, we are only concerned with the ICT related ones.

In this paper, we analyze the relationship between the AVU and two of its strategic partners – Curtin Business School, Curtin University (Graber & Bolt, 2011) and Royal Melbourne Institute of Technology (Kigotho, 2006).

Drawing on the activity theory framework, Table 1 reflects the activity structure of the AVU case study. In order to be able to provide answers to the research questions this paper is addressing, the elements of the activity must be straightened out. These include the objective of the activity, tools, community, division of labour and rules. This table helps to identify from the case studies the various elements of activity as well as the contradictions existing between and within the elements.

Table 1: Activity Structure of the AVU Case Study

Categories	Information	Comments
Object	Main objective is to significantly increase or improve access to high quality higher education in Sub-Saharan Africa.	<p>Specific objectives include (AVU Charter, 2010, p. 3):</p> <ul style="list-style-type: none"> • Increase access to tertiary and continuing education in Africa by reaching large numbers of students and professionals in multiple sites simultaneously; • To increase access to higher quality Open, Distance and eLearning (ODeL) resources that are relevant to Africa. • To enhance the capacity of African tertiary educational institutions. • To enhance and sustain a network of Partner Institutions • To build and sustain partnerships with institutions that can support the African Virtual University Mission. • To carry out research and evaluation activities on the African Continent. • To build and sustain a committed and effective African Virtual University organization. • To develop and implement a fund raising strategy in support of all of the above objectives with focus on African Governments, the Private Sector and International Organizations.
Tools	ICT and non-ICT tools that mediate between the AVU and its objectives (to significantly widen access to high quality higher education in Sub-Saharan Africa); in terms of curriculum, liaising with partner institutions, teaching and learning functions, administrative duties, assessments and so on.	<ul style="list-style-type: none"> • Computer Tools (Learning and Teaching Tools, CD-ROMs, Internet bandwidth, Databases, Video conferencing systems, cameras, etc.) • Non-Computer tools (Administration, learning and teaching tools, classroom infrastructure in partner institutions)
Rules	Procedures and policies that mediate between AVU and its community; sub-Saharan Africa, partner institutions, donors, strategic partners	<ul style="list-style-type: none"> • The AVU to ensure fees are paid promptly to partner institutions • Methods of assessments • Online and Virtual Teaching procedures • Students liaise with partner institutions for their programs • Degrees are awarded by and in the names of partner institutions • Expected Student behaviour • All standards set by various stakeholders – AVU, Board of Directors and Strategic Partners.
Community	Donors; Local Partner Institutions; member states; Open, Distance and eLearning centres; and Strategic partners	<ul style="list-style-type: none"> • Donors are, “governments, government agencies, organisations, institutions, companies, corporations and other entities and persons that may provide the AVU with donations, grants, gifts of money and any other movable and immovable property and any other kind of financial and material assistance”. • Partner Institutions are “universities, other institutions of higher learning in Africa, and non academic partners, which participate in the programmes of AVU or run joint programmes of the AVU”. • Member states are “Republic of Kenya, Senegal, Mauritania, Cote d’Ivoire and Mali and such other sovereign states on the African Continent as may be admitted to the membership of the AVU from time to time” • Open, Distance and eLearning centres are referred to as “locations which have been certified to run AVU programmes or programmes run jointly by the AVU and the Partner Institutions”. • Strategic Partners encompass “donors, institutions, corporations, companies, organisations, persons from public and private sectors and/or academia selected on the basis of their competence, qualification, integrity and willingness to serve for the good of the AVU and to mobilize and raise funds for the purposes of the AVU”
Division of Labour	Roles and responsibilities of stakeholders working together in other to achieve the objectives of the AVU. Primary – roles and responsibilities of partnering institutions and students	<ul style="list-style-type: none"> • Partnering institutions are to prepare learning materials, coordinate learning activities via the virtual platform, assess students’ performances • Likewise, Students are expected to participate in the production of learning materials, behave ethically during lecture times, be responsible for their own learning habits and discipline (individually or collectively). • Administrators and staffs with designated roles functioning in their various capacities.

4. Method

This conference paper draws upon the analysis and findings from two published case studies on the African Virtual University's partnership model. The case studies reflect on the context of two universities in partnership with the AVU - Curtin Business School, Curtin University (Graber & Bolt, 2011) and Royal Melbourne Institute of Technology (Kigotho, 2006). This is an unusual method but it is used in this conference paper to explore activity theory's principle of contradiction and its use in a virtual learning context. As such, analysis of the published cases focused on the characteristics of language as communication with attention to the contextual meaning of the text (Hsieh & Shannon, 2005). Again, the main goal of the method used is to provide knowledge and understanding of the phenomena under investigation; that is, systemic tensions or contradictions in the partnership model between the AVU, RMIT and Curtin. In other words, we examined the texts of the published paper - Kigotho (Kigotho, 2006) and (Graber & Bolt, 2011) - and analyzed them to provide an understanding of contradictions within an E-education setting.

5. Case Analyses

5.1 AVU – RMIT Partnership (Kigotho, 2006)

Kigotho's (2006) account of the partnership between the AVU and Royal Melbourne Institute of Technology (RMIT), though a short article reflects some interesting contradictions for analysis. The partnership is based on the agreement that RMIT would provide their course work to the AVU, which would then distribute the work to its learning centres located at partner universities in Africa. Students that are enrolled in the program gain access to the materials via their local universities and at the end of the day earn a degree from RMIT.

As at the time the article was written, Kigotho (2006) recorded that about 27,000 students and professionals had benefited from the partnership, spread out among 53 institutions in 27 African countries. However, there came a time the partnership became too expensive for the AVU as the institution could no longer afford to pay RMIT. According to the rector of the school, the partnership model was not cost effective, flexible or relevant to the students. Constraints such as insufficient funds, difficulty in buying materials needed by students, inadequate student-support system, and a weak and costly technological infrastructure (including region wide problems with internet connectivity) hampered the partnership model. These problems resulted in systemic tensions between the AVU, RMIT and its students. The nature of contradictions noticed in this case are as follow:

Contradiction between Subject and Rules

The AVU failed to meet its payment to RMIT, which provided the course work for a degree program in computer sciences in which about 600 students were enrolled.

Part of the rules in the contract signed between AVU and RMIT was that the AVU will not at any time fail to meet payments of services rendered by RMIT. RMIT claimed that the AVU owed a sum of \$1.6million for the services already rendered. Due to the inability of the AVU to pay this fee on time, RMIT suspended the program in July 2006. This is a contradiction because it reflects a breach of rules by the AVU and the consequence reflected in the way RMIT pulled out of the partnership.

Contradiction between Subject and Object

The above contradiction also reflects a contradiction between the AVU and some of its objectives. The AVU charter clearly stated the following objectives:

- To enhance and sustain a network of Partner Institutions
- To build and sustain partnerships with institutions that can support the African Virtual University Mission

Failing to pay the fees for the services rendered by the RMIT, the AVU successfully caused conflict between her and RMIT. The conflict was apparent in Kigotho's (2006) report of the case. "Royal Melbourne suspended the program in July after the African Virtual University failed to pay \$1.6million it owed the institute..." Additionally, "Mr Dzvimbo [rector of the AVU] said he was disappointed by Royal Melbourne's decision and noted that the African Virtual University had paid Royal Melbourne more than half of what it owed and planned to pay the rest as money became available."

This contradiction led to the mutilation of the relationship/partnership between the AVU and RMIT, which is against the AVU's objectives.

Contradiction within subjects

Students of the AVU were angered at the decision of the RMIT to pull out of the partnership. The students expressed their displeasure at the saga because it resulted into an outcome that was neither expected nor favourable to them. One of the rules of participating in the partnership between the AVU and RMIT was that the students would earn a degree from RMIT at the completion of their studies. However, due to the conflict that ensued between the two institutions, the possibility of that outcome has been jeopardized.

One of the students, Paul Aroyo said, "We enrolled for Royal Melbourne programs because they were accredited by a reputable university". His comment reflects an expectation to graduate with a degree from RMIT. He lamented the implications of the contradiction. The consequence of this, as Kigotho (2006) reflects was that; "Students who have not finished their degrees by the end of this month will be automatically transferred into computer-science programs offered by their local universities... That has angered many students, who feel that a degree from Royal Melbourne carries more prestige."

Contradiction between Subject and Community

"Local partner universities must pay the African Virtual University a portion of the tuition they receive from students, which is then used to cover administrative costs and pay the foreign university for programs" laments Mr. Dzvimbo.

From Mr Dzvimbo's comments, it appears the local universities have not been paying the AVU the required portion of the tuition fees they received from students. Little wonder the AVU owes its international partner institutions. While Kigotho (2006) stressed that in reality, tuition fees from local partner institutions only covers about 13% of the total costs of RMIT contracts with the AVU and that the remaining 87% came from donors, which are mainly development organisations. Judging from that data, for the AVU to still owe RMIT \$1.6million also reflects that not much has been received from donors just as the case with the local partner institutions. This reflects a contradiction between AVU and its community of donors and local partner institutions.

5.2 AVU - Curtin University (Graber & Bolt, 2011)

Graber & Bolt's (2011) account of the partnership between the AVU and Curtin University is also an interesting account of systemic tensions that led to the failure of the partnership model. It was a \$4million (AUD) initiative that was to run for three years with several other partner institutions in Africa including, Addis Ababa University, Ethiopia; Kigali Institute of Science and Technology, Rwanda; Kenyatta University, Kenya; and University of Dar es Salaam, Tanzania. Curtin Business School provided business degree courses while Curtin Kalgoorlie's Vocational Training and Education Centre (VTEC) provided business diploma courses.

The delivery of courses from Curtin University was made possible via a central WebCT platform tailored to suit local needs of the students. Students from various locations of the AVU centres were allowed to pose queries on the platform and facilitators responded and monitored students' progress using the same medium. Every student had the opportunity to access learning materials as well as submits his/her assignments through the same medium. Students also engaged in collaborative study to foster a more student-centred learning approach.

Contradiction within rules

It has been registered that one of the biggest challenges in delivering distance education in Africa has been the lack of access to the internet and infrastructure (Ondari-Okemwa, 2002; Unwin et al., 2010). The case of the AVU was not different. While one would think a virtual university like the AVU would have all infrastructures in place to support its virtual teaching and learning objectives, the otherwise was the case. It was noted in Graber and Bolt's (2011, p. 83) account that,

"There were more students enrolled in courses than could be catered for by the existing facilities and equipments". Moreover, "there were too few resources for the number of students involved; for example, there were not enough computers for students".

Consequently many students didn't have access to ICT facilities, even at their local learning centres. "Videos, CDs and DVDs were all used and students were encouraged to use hard copies because access to digital resources was limited" (p. 85). It is apparent that lack of access to resources for major teaching and learning activities in a distant or virtual learning initiative is a recipe for disaster if care is not taken. This is a case of overcrowding; where the number of students is more than the resources available to cater for them.

Contradictions within Subjects

It appears that members of the AVU and Curtin University had some misunderstandings as to their agreement to the contract. Several instances were recorded to justify this contradiction. For instance it was recorded that, "there were also differing expectations and understandings about the terms of contracts, roles and delivery of courses. Changes in personnel, strikes and technological difficulties further complicated the situation" (p. 85). Likewise, just as the case with RMIT, "Curtin University experienced difficulty receiving payment from the AVU." As a result, "Curtin University Staff had to act flexibly in such circumstances to do what could be done to help students complete their courses." (p. 84)

These statements reflect that some members of the AVU and Curtin University had contradictory beliefs about their roles and responsibilities in the partnership. An example of

such instances was recorded; “it took a lot of time to develop curriculum resources; [however] once developed, the use of the curriculum resources was not maximised”. Another issue that was recorded was that, “staff did not trust each other and could not work in teams” (p. 81). This apparently describes an epileptic and incongruous handover of activities that took place between the two institutions as a result of misalignment of roles and responsibilities.

Contradictions between subject and tools

Contradiction between availability of ICT and limited human resources; that is, support staff for the ICT resources. It is one thing for tools to be available and enough; it is another thing however to have staff support for the available tools.

As with several African universities and tertiary institutions, the AVU had issues of low human resources. Graber and Bolt (2011, p. 85) recorded that, “the project was resource-intensive and more operational people were needed to support the project”. Despite the resource intense nature of the project, the AVU seem to have underestimated the project not only in terms of cost but human resources as well. Graber and Bolt (2011, p. 81) recorded that; “there were insufficient numbers of trained staff, a high staff turnover rate and lack of awareness about how to use information technology; there was a lack of staff training and both staff and students had limited IT skills.” As a result, they reflected that, “there was a need for more suitably skilled staff, hardware, software and infrastructure to be provided” (p. 85).

Contradiction within tools

It is no gainsaying that the effective use of some tools rely not only on the availability of others but also their effective and smooth running as well. While it is apparent that access to internet or ICT facilities in Africa is a major challenge; how about the question of other related tools or infrastructure that are linked to the use of the internet or ICT facilities. For instance, electricity, internet bandwidth, telephone services in most of Africa today is poor and epileptic. The AVU case is not left out of the challenge of epileptic power supply.

Graber and Bolt’s (2011, p. 81) account recorded that “the [AVU] learning centres which required efficient and effective communications, often had unreliable and costly internet connections and telephone services... Electricity supplies fluctuated and interfered with the ability to deliver the AVU courses.” In the same account (p. 83), they recorded that “there were insufficient number of workstations available and electricity supplies were inconsistent, although the implementation of uninterruptible power supply (UPS) machines for back up reduced downtime”. There goes the additional cost that the epileptic power supply brings.

Most of AVU partners in Africa faced difficulties “because of limited access to the World Wide Web, low bandwidth, restrictive communication policy, high telecommunication costs, slow internet connectivity, limited computing resources and infrastructure...” (p. 81). The problems are not any different from ones identified in literature in African higher education debates [for instance, (Ekundayo & Ekundayo, 2009)].

Contradictions between subject and community

One of the major problems that could hinder the running of an institution is if it lacks the backing of the government or if the government in one way or the other appears not to favour any its services. As Ekundayo and Ekundayo (2009) highlighted in their paper, the African higher education system is not immune to the demoralizing mode of governance over the

years in Africa. This is encapsulated in recurrent riots and civil wars, era of military rule coupled with the general feelings of injustice and insecurity.

To think the AVU will be immune to this challenge would be a fallacy. Graber and Bolt (2011, p. 84) recorded that, “there were many hurdles to students successful completion of these business courses. For example, during the implementation of this programme some students were under the threat of death by the militia.”

That was not the only issue with regards to the contradiction between the AVU and the government; some governments also had regulations as to the use of ICT in their country. Graber and Bolt (2011, p. 85) recorded that “whereas the initial intention was to transmit lectures via satellite, government regulations in Ethiopia resulted in the need to video lectures at short notice.”

6. Discussion

In this study, systemic tensions, conflicts of interests, disruptions and issues challenging the partnership model of the AVU with international institutions were identified. Activity theory’s principle of contradiction not only brings to attention these issues within an activity system (such as that of the AVU and its partners) but also helps to reflect on changes that could be made which could lead to innovation or further development. For instance, in the example of the contradiction between the AVU and RMIT/Curtin, where the AVU could no longer afford the fees for the services its partner institutions were rendering; identifying that contradiction brought about a change – a new or revised model of the AVU. The new model, according to Mr Dzvimbo, “is affordable and is intended to increase equitable access to demand-driven programs in African universities”. This highlights contradiction as an element of change, innovation and development. Moreover, the identification of contradiction that emerged from staffs of AVU and Curtin not having to understand or grasp their roles and responsibilities led to the review of the AVU charter on 4th of February, 2010.

Activity theory’s principle of contradiction views conflicts or tensions as not so much rooted in the personalities of individuals but as rooted in the systems in which individuals are a part of (Murphy & Rodriguez-Manzanares, 2008). The implications of contradictions in an educational setting like that of the AVU are numerous. First, the analysis of contradictions can help an institution do a feasibility study before introducing ICT into their curriculum. Because activity theory offers the advantage of a socio-cultural spectrum, all constituents of the activity system can be taken into account when conducting such feasibility study. Also, it could help access the various expectations, perceptions and beliefs of the users (teachers and students) of the technology and how to adapt it to suit the objectives of the institution (Basharina, 2007). Moreover, analysis of contradictions could also help in clarifying the unique roles and responsibilities of people or institutions involved in an educational setting. Parties involved could jointly outline features of their roles and how to work out division of labour amongst them (Murphy & Rodriguez-Manzanares, 2008).

7. Conclusions

In this study, we have looked into how activity theory’s principle of contradictions can help guide studies on virtual universities. Specifically, we have looked into the partnership model of the AVU with two international partners – RMIT and Curtin University. The analysis of the case studies revealed some interesting contradictions and insights into the AVU partnership model. The perspective activity theory offers is the opportunity of a social cultural spectrum that makes analysis wholesome without disregarding any element of the activity.

We noticed in our analysis different levels of contradiction; mainly the primary and secondary levels. The primary levels ranged from contradictions within rules: for instance, the issue of overcrowding – the resources available are not able to cater for the number of students enrolled; within subjects: the AVU and RMIT staffs failing to fully grasp their roles and responsibility in accordance to the contract agreements; and lastly within tools. We also identified some secondary level of contradictions which includes between subject and tools: for instance, the AVU's limited human resource to cater for their ICT infrastructure; between subject and rules: for instance, the AVU failing to meet payment terms with both RMIT and Curtin University; others include between subject and object; subject and community. Activity theory's principle of contradictions is not about conflicts, tensions or disruptions in activity systems alone, it is also about how studying these systemic tensions could bring about change, innovation or development. After our analysis of the contradictions in the cases, we discussed the implications of contradictions as a research tool and how it brought about change in the AVU partnership cases.

References

- African Virtual University. (2011). *About AVU*. Retrieved July 5, 2011, from <http://www.avu.org/About-AVU/introduction.html>
- AVU Charter. (2010). *Charter of the African Virtual University or the AVU*. Retrieved July 5, 2011, from <http://www.avu.org/images/Documents/avu-charter2.pdf>
- Barab, S., S. Schatz, and R. Scheckler (2004). Using activity theory to conceptualize online community and using online community to conceptualize activity theory. *Mind, Culture and Activity*, 11(1), 25-47.
- Basharina, O. K. (2007). An activity theory perspective on student-reported contradictions in international telecollaboration. *Language Learning & Technology*, 11(2), 82-103.
- Bedny, G. Z. and W. Karwowski (2004). Activity theory as a basis for the study of work. *Ergonomics*, 47(2), 134-153.
- Benson, A., C. Lawler, and A. Whitworth (2008). Rules, roles and tools: Activity theory and the comparative study of e-learning. *British Journal of Educational Technology*, 39(3), 456-467.
- Blin, F. and M. Munro (2007). Why hasn't technology disrupted academics teaching practices? Understanding resistance to change through the lens of activity theory. *Computers & Education*, 50(2), 457-490.
- Demiraslan, Y. and Y.K Usluel, (2008). ICT integration processes in Turkish schools: Using activity theory to study issues and contradictions. *Australasian Journal of Educational Technology*, 24(4), 458-474.
- Ekundayo, M. S. and J. Ekundayo (2009, December 6-9). Capacity constraints in developing countries: A need for more e-learning space? The case of Nigeria Symposium conducted at the meeting of the ASCILITE conference, Auckland, New Zealand.
- Engeström, Y. (1987). *Learning by expanding: An activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit.
- Engeström, Y. (1999). Activity theory and individual and social transformation. In Y. Engeström, R. Miettinen, & R.-L. Punamaki-Gitai (Eds.), *Perspectives on activity theory*. Cambridge, MA: Cambridge University Press.
- Engeström, Y. (2001). Expansive learning at work: Toward an activity-theoretical conceptualization. *Journal of Education and Work*, 14(1), 133-156.
- Engeström, Y. and R. Miettinen (1999). Activity theory: A well-kept secret. In Y. Engeström, R. Miettinen, & R.-L. Punamaki-Gitai (Eds.), *Perspectives on activity theory* (pp. 1-15). Cambridge, MA: Cambridge University Press.
- Graber, M. and S. Bolt (2011). The delivery of business courses via the African Virtual University: a case study. *Open Learning*, 26(1), 79-86.

- Hsieh, H.F and S.E Shannon (2005). Three Approaches to Qualitative Content Analysis. *Qualitative Health Research*, 15(9), 1277-1288.
- Hu, L. and M. Webb (2009). Integrating ICT to higher education in China: From the perspective of activity theory. *Education and Information Technologies*, 14 (2), 143-161.
- Igira, F and M. Aanestad (2009). Living with Contradictions: Complementing activity theory with the notion of "installed base" to address the historical dimension of transformation. *Mind, Culture and Activity*, 16(3), 209-233.
- Jonassen, D.H. and L. Rohrer-Murphy (1999). Activity theory as a framework for designing constructivist learning environments. *Educational Technology Research and Development*, 47(1), 61-79.
- Kaptelinin, V. (1996). Activity theory: Implications for human computer interaction. In B. Nardi (Ed.), *Context and consciousness: Activity theory and Human Computer Interaction* (pp. 45-67). Cambridge, MA: MIT Press.
- Kigotho, W. (2006). Facing financial difficulties: African virtual university revamps itself. *The chronicles of higher education*, 53(17), 44-46.
- Leont'ev. (1947). *Outlines of the developments of mind*. Moscow: Moscow University Press.
- Lim, C. P. and D. Hang (2003). An activity theory approach to research of ICT integration in Singapore schools *Computers and Education*, 41(1), 49-63.
- Murphy, E. and M.A Rodriguez-Manzanares (2008). Using activity theory and its principle of contradictions to guide research in educational technology. *Australasian Journal of Educational Technology*, 24(4), 442-457.
- Mwanza. (2001). Where theory meets practice: A case for an activity theory based methodology to guide computer system design *The Open University*. Symposium conducted at the meeting of the INTERACT 2001: Eighth IFIP TC 13 Conference on Human-Computer Interaction Tokyo, Japan.
- Mwanza, D. and Y. Engeström (2005). Managing content in e-learning and environments. *British Journal of Educational Technology*, 36(3), 453-463.
- Ondari-Okemwa, E. (2002). Challenges of harnessing virtual information resources in Kenya: The case of the African Virtual University. *Journal of Information Science*, 28(4), 321-329.
- Roth, W.M. (2004). Activity Theory and Education: An introduction. *Mind, Culture and Activity*, 11(1), 1-8.
- Rubinshtein, S.L (1935). *Foundations of psychology*. Moscow: Education Press.
- Unwin, T., B. Kleesen, D. Hollow, J. Williams, L.M Oloo, A. John, ... M. Xavier (2010). Digital learning management system in Africa: Myths and realities. *Open Learning*, 25(1), 5-23.
- Vygotsky, L.S (1979). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wartofsky, M. (1979). *Models: Representation and scientific understanding*. Dordrecht: Reidel.