

The implications of large classes on active learning at University of Rwanda-College of Education

Leon Mugabe¹ & Irénée Ndayambaje²

^{1,2} university of Rwanda-College of Education, School of Education

Abstract

The gist to this study was to explore the issue of large classes at University of Rwanda-College of Education and determine its implications on active learning. Descriptive survey research design was used and classes of over 100 students were sampled. The sample size comprised 10 lecturers and 23 class representatives. Primary data were collected by means of one to one interview for lecturers and student' class representatives. Secondary data were analyzed statistically while primary data were analyzed thematically. Results indicated that large classes limit the level of students' engagement. This study therefore recommends the (i) set up of a long term plan for the college to recruit more academic staff to reduce the class size, (ii) the enforcement of the use of ICT to support students' engagement beyond the physical classroom, and (iii) the use of other cost-effective pedagogical strategies that enhance active, collaborative and peer learning in large classrooms.

Key words: Active learning, large classes, University of Rwanda-College of Education

1. Background to the study

Higher education has become the worldwide main pillar to individual and society development. Before the 19th century, this sector of education was neglected with low forms of financial investments. In the 20th century, the situation has considerably changed. According to Ozturk (2001), higher education, with its capacity of providing knowledge, analytical and critical thinking skills, became a determinant of both individual and countries sustainable economic development. It has become an important form of investment which changes from remaining a prerogative for elites to general mass access. By doing such a radical shift, higher education became then a pillar towards innovation and social economic transformation (UNESCO, 2010). Bloom, Canning and Chan (2006) as well as Saba (2012) talked of higher education as a means of human capital development in order to face the knowledge-based competition in industry and trade positions which require some level of post high school studies in the 21st century. With the reconsideration of higher education in the 20th and the 21st century, countries throughout the world experienced pressures of high demand in this sector. This resulted in what Mohamedbhai (2008) called "massification" of higher education.

The developing world has much suffered of such a kind of massification because in most countries, especially the ones in Africa, the exponential increase of students has not been proportionated to the available infrastructures. Effah (2005) reported the case of Ghana whereby a university originally meant to host 3,000 students was forced to enroll about 24,000 students in 2005 and worse indeed this expansion did not cater for required academic staff and physical facilities. A similar example is given by Jawitz (2013) who reported that in 2011, thirty-six undergraduate courses at the University of Cape Town had a higher number of registered students than 458.

Statistics show again that since the year 2000, Higher Learning Institutions (HLI) continued to experience annual average increase in enrolments rate: 44% in Ethiopia, 39% in Burundi, 30% in Burkina Faso, 28% in Tanzania, 18% in Ghana, and 17% in Senegal and 61% in Rwanda (Mohamedbhai, 2008).

In Rwanda, students' enrolment rapidly progressed from 49 students initially enrolled in the National university of Rwanda in the year 1963 to 5,678 in the year 1999 (UNESCO, 2000). The figure was raised to attain 26,378 in the year 2005 and 73,674 in the year 2015 while in 2018, higher education institutions in Rwanda enrolled a total of 75,713 students (MINEDUC, 2015 & 2018)

Nonetheless, the rapid increase of classroom intakes in HLI is not a problem itself. Large intakes in HLI become an issue when the prevailing study conditions hinder meaningful teaching and learning (Onwu, 1999) or when the classroom environment does not support active learning (Bransford et al., 1999). Therefore, a class becomes large when the lecturer feels unable to make all students progressing (Blatchford et al., 2002). At the University of Rwanda-College of Education (UR-CE), the data of students' registration by study combinations and corresponding teaching staff revealed that in the 2013/2014 academic year, courses in education, biology, English, chemistry, and others were frequently organized in classrooms of more than 100 students per class.

Whereas previous researchers like Massiata (2012), Cuseo (2007), and Blatchford, et al. (2002) were interested to contrast the level of classroom interaction in small classroom vis-à-vis larger classroom settings, the present study was set to explore the issue of large classes in a financial constrained context where massive access to higher education is still required to fix the gap of qualified human resources for various national subsectors; education in particular. In effect, the researchers had the conviction that still in a large class context, effective learning can still happen if adequate strategies are adopted and continuously enforced.

2. Statement of the problem

The increased access to lower levels of education has brought pressure to higher education institutions to open up doors for more students' intakes with big numbers; a move that did not go hand in hand with the increase of university teaching staff and supporting infrastructures (Association of Universities and Colleges of Canada, 2011).

According to Montanini (2013), African universities are now facing the issue of inability to absorb and properly handle students in tertiary education due to insufficient resources (human, financial and infrastructural) which undermine the quality of teaching, limit students' engagement in the learning process, hinder students' assessment and by extension affect negatively the quality of graduates.

Thus, if University of Rwanda-College of Education continues experiencing large classes yet it trains teachers expected to be proficient in the subjects' content and teaching approaches before they graduate, there is a high imperative to scientifically examine the magnitude of this issue of class size and propose workable solutions that shall continue guaranteeing that students are gained acceptable level of academic training. This study sought to investigate the situation of large class teaching at the UR-CE, to examine lecturers and learners' perceptions about large class effect on teaching process at the UR-CE, to identify challenges encountered by

lecturers and students in large class environments at UR-CE, and to propose strategies to mitigate constraints to active learning in large classes at the UR-CE.

5. Review of related literature

5.1 Different perceptions about a large class

The perceptions on large class differ as the views of researchers on the issue also differ. In fact, it is not easy to get the real meaning and the size of a large class as it can be easy to get the one of a small class frequently consisting of less than 20 students (Blatchford et al., 2002). In the view of Shamim et al. (2007), the definition of a large class remains difficult to seize simply because of a number of variables involved such as study discipline, lecturers, learning institutions and the country.

The definition around large class was also at the heart of the discussions of senior academics who attended a UNESCO regional workshop on teaching and learning in higher education at Moi University, Eldoret in Kenya (Nayak & Rao, 2004). This forum concluded that a large class does not have a fixed number. Hence, the definition would vary from one discipline of study to another. In effect, what is said to be a large class in social sciences would differ coming to medicine or engineering.

However whatever controversies might be, there are minimum national and international standards, which need to be respected. In the United Kingdom for instance, if the number of students is 30 or more per teacher in higher education classes, such classes are too big and therefore institutions are required to hire teaching assistants (Blatchford et al., 2002). In support of this, Moodley (2015), a class of 60 to 149 is large while the one of 150 and more is very large. This is not quite different from Rwanda. The National Higher Education Institutional Infrastructure and Academic Standards⁴ recommend 1:25 as teacher/Student Ratio. These ratios are far away from 1: 17 teacher/student Ratio registered in the UK, 1:15 in USA and 1/10 in Japan (University and College Union, 2010). Therefore, a class becomes large when the lecturer feels unable to make all students progressing (Blatchford et al., 2002), when a class has more students than support facilities (Nayak & Rao, 2004).

5.2 Educational challenges related to large classrooms

Teaching large classes is challenging because it brings pressure to human resources as well as support physical resources and structures. According to Kerr (2011), large classes reduces students' active participation to the extent that there are those who can finish a whole term having not had a personal interaction with the lecturer (Cuseo, 2007). This brings indeed more challenges in terms of classroom management whereby some students end up into developing abnormal and disorderly behaviors or conducts (Shamim et al. 2007). It was also observed that the bigger the class, the likely the increase of cases of absenteeism or inactivity for some learners (Blatchford et al., 2002).

⁴http://www.uck.ac.rw/Guiding_documents/HEC%20HIGHER_EDUCATION_INSTITUTIONAL_INFRASTRUCTURE_AND_ACADEMIC_STANDARDS.pdf

Whereas adequate teaching and learning resources are paramount to guarantee the quality of education, the big class size is an obvious hindrance to adequate provision and usage of instructional materials, and this deteriorates the quality of teaching and learning (Oliveira & Farrel, 1993). Moreover, the increased number of students which is not in tandem with available space compels students to be seated in a poor and restricted seating arrangement (Al-Jarf, 2006; Shamim; et al., 2007).

Assessment of learning through continuous and formative assessments is another core principle of effective learning. Nonetheless, large classes constitute a burden to the lecturer resulting into his/her inability to provide regular individualized feedback and limited lecturers' number of assessment due to increased teaching load (Cuseo, 2007).

5.3 Strategies for handling large classes

Despite challenges of teaching large classes outlined in the previous section, large classes offer a unique opportunity of creating excitement among students who are naturally endowed with different skills and potentials. Strategies articulated in this section turns around a new orientation to education, classroom management, students' engagement in learning and the use of technology in teaching, learning and assessment of learning.

In the context of increased demand of higher education, Haddad (2002) calls for a *new orientation to education* with the focus being put on education accessed anytime, anywhere and this goes beyond the face-to-face institutional modality, education which prepares for the quickly and dramatically changing future. While Sekiwu (2009) emphasizes that in the context of large classes, the lecturer is expected to incite learners to think deeper, Jungic; et al, (2006) underline careful time management as a cornerstone component while handling big classes (Jungic et al (2006).

Considering the fact that large classes require *setting classroom rules and regulations*, it is recommended to *use small group works* to make large classes smaller (Herington & Weaven (2008). In relation to students' engagement in learning, a good numbers of authors including Al-Jarf (2006), Shamin et al (2007), Sekiwu (2009), Kerr (2011) recommend the *classroom interaction through various techniques* like think-pair-share, collaborative learning, clickers, peer mentorship programs. They also recommended maintaining student's attention by making the classroom lesson as an engaging story.

Technology is foreseen as a break away the challenges imposed by large classes. According to Mahadeo (2012), the use of technology creates a sense of community learning for students who use it through websites, video or audio-recorded messages, and discussion boards and chats (Kerr (2011). On this pint, Cuseo (2007) recommends the use of LMS (Learning Management Systems) to facilitate learning and communication between lecturers and students.

To conclude, although there is no conventional number to consider a class as large, when available resources (lecturers, material resources) are proportionally low to serve adequately the number of students and more importantly to facilitate individual interaction between lecturers and learners, that class is considered to be large and does not encourage students' engagement in learning.

6. Research methodology

The present study was carried out at the UR-College of Education where lecturers often manage large classes generated from different combinations or crosscutting education related teaching subjects. It therefore intends to explore the issue of large classes at UR-CE and determine its implications on active learning. All teaching staff and all learners of the UR-CE constituted the target population; that is 178 lecturers and 6407 students. The researchers adopted a descriptive survey research design to assess the prevailing situation of large classes at the College of Education.

Purposeful sampling strategy was used to determine the sample population for lecturers. Within purposeful sampling strategy, the study resorted to “extreme case” (Macmillan & Schumacher 2006) sampling to select lecturers who frequently teach more than 100 students at a go in one lesson/module. 10 lecturers believed to be accustomed to the issue under inquiry were selected (Macmillan & Schumacher, 2006). This number was deemed scientifically manageable during interview sessions.

For students, the sample population was selected using “reputational case” as a purposeful sampling strategy (Macmillan & Schumacher: 2006). This sampling strategy simply seeks to obtain recommendations of knowledgeable experts who, according to Babbie (2001) should be nominated on the basis of their relevance and relationship to the topic under study rather than using rigorous probability sampling methods, meaning that the selected sample does not necessarily represent any meaningful population statistically. It is in this context that 9 class representatives heading large class groups were selected to account for what happens in large class attendance.

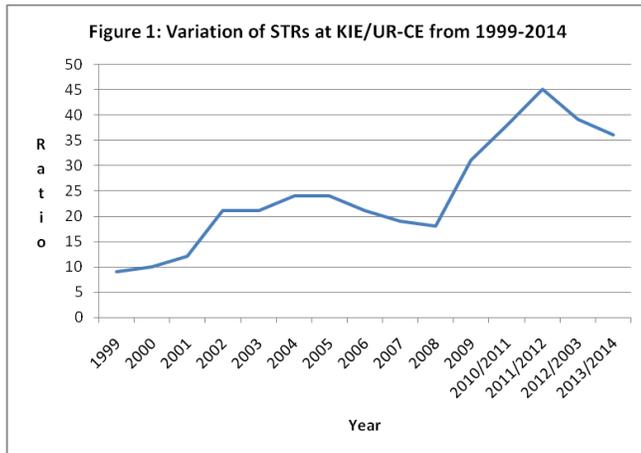
Document research was used to collect statistical data on lecturers and students record at UR-CE. Information from students was collected using focus group interviews. Five focus group composed of five students representing different large class learning subject were formed. Information collected from interviews was analyzed using thematic analysis. The validity was assured by means of piloting interview guides. Triangulating was used as a means to countercheck and confirm the information provided by different sources of informants (lecturers, students). Secondary data were collected as well, analyzed statistically and presented in forms of percentages and figures.

7. Research findings

7.1. The situation of large classes at UR-CE

The current situation of large classes at the UR-CE is not a recent phenomenon. The number of registered students has been increasing to the rates which exceeded the number of recruited lecturers. *Figure 1* highlights the evolution of Student- Lecturer Ratio of the UR-CE (former KIE) from 1999 to 2014. It summarizes data obtained from the KIE quarterly Report (2011) which show that UR-CE started in 1999 with 300 students and 38 lecturers, that is 8 students per lecturer. The number continued to grow and in 2012, the institution was hosting 7035 students against 171 lecturers, that is 41 students per lecturer.

Figure 1: Variation of Student/Teacher Ratio at KIE/UR-College of Education (1999-2014)

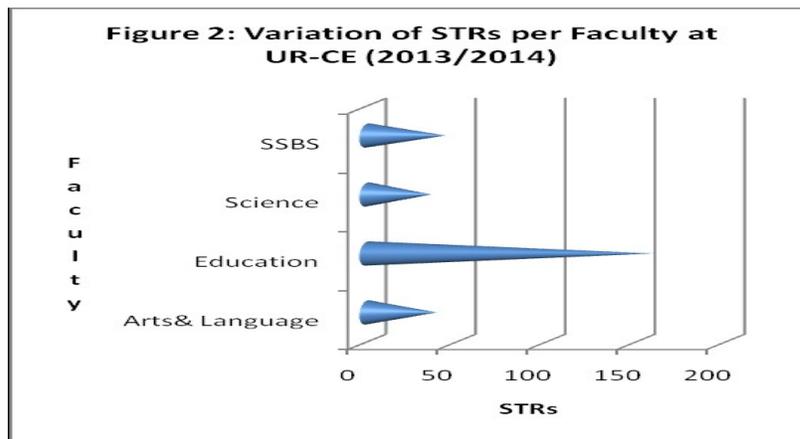


Source: Secondary Data

The deep analysis of those statistics reveals that, the ratios expressed at institutional level did not really reflect the situation of large classes. It is worth to mention that all combinations in the faculty do not have the same class size as shown in *Figure 2* below which expresses differences of ratios at faculty level. It clearly shows that the faculty of education dominated others due crosscutting modules.

In fact, during the academic year 2013/2014, the Faculty of Education counted 40 lecturers who were assigned to teach cross cutting modules; mainly education to 6440 KIE students all levels combined. On average, each lecturer was expected to teach a class size of 161 students. Besides crosscutting modules, the average numbers of students taught per module was not too high.

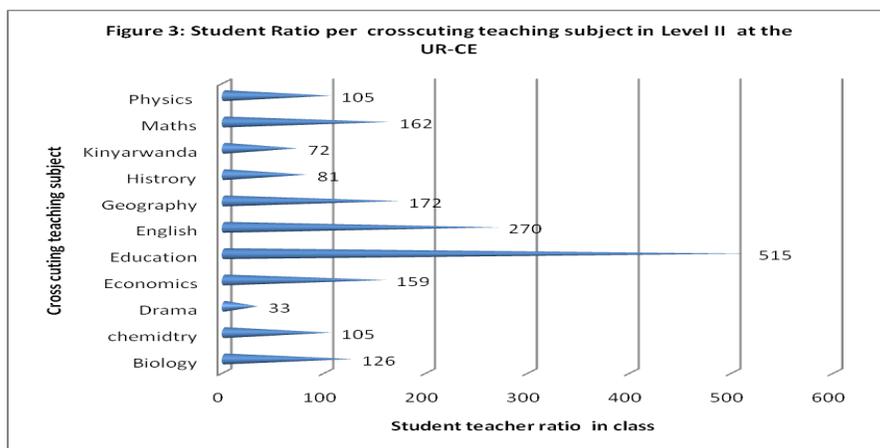
Figure 2: Variation of Student/Teacher ratios per Faculty at UR-College of Education (2013-2014)



Source: Secondary Data

For instance, in the Faculty of Sciences, 67 lecturers were teaching science related courses to 2368 students to make an average of 36 students per lecturer. In the Faculty of Social Science and Business Studies (SBSS), 28 lecturers were teaching 1221 students to make 44 students per lecturer whereas in the Faculty of Arts and Languages, 43 lecturers taught 1686 to make 39 students per lecturer. *Figure 3 below* illustrates again the fact that education modules constitute the big classes clocking even to 515 students per class, followed by English modules where about 270 students were regrouped into one class whereas drama classes countless size of students.

Figure 3: Student ratios per crosscutting teaching subject in Level II at UR-CE (2013/2014)



Source: Secondary Data

7.2. Perceptions of UR-CE academic Staff and students towards large classes at UR-CE

When informants (lecturers and students) were asked their perception on the size of classes they often attend at UR-CE, their overall perception from both of them was that, be it in science, arts, social science or education, classes are large when they are organized for crosscutting subjects. Some of them even consider their respective classes as “far large”, “very large”, “too large” or “extremely large”. In terms of numbers, both lecturers and students consider a classroom exceeding 40 students as large. One of the lecturers referred to the existing regulations and reported that “...having more 25 students recommended in the National qualification framework, the class has already become large”.

Respondents have however reported some of the advantages of attending large class with controversies between them. One student was quoted as follows:

“...Ideas in a large class are diversified. If there is a problem to discuss, two or three students can fail to find a solution, but when students are many, the solution can easily be found from ideas of many other students.”

From lecturer’s point of view, there are no advantages of attending a large class except the will to minimize resources: One of the lecturers who is also a subject leader highlighted: “...from a manager’s perspective, a large class is good, it uses less resources in terms of money, in terms of time also....but as a lecturer, from the learning perspective, I don’t see any advantage.”

7.3. Challenges encountered by lecturers and students in large classes environments at UR-CE

In this study, four main challenges were identified as being hindrances to active learning due to large classes:

Classroom management: Both lecturers and students expressed dissatisfaction of attending large classes often organized for hundreds of students in large classroom halls, with limited and unstable, squeezed and disordered sittings which prohibit the easy physical movement. Other students reported the loss of time in classroom arrangement before the beginning of the class, high rates of absenteeism due to the lack of time for controlling attendance as well as the difficulty to entertaining individual relationship between them and students. A lecturer re-iterated that:

“... sometimes you don't know some of the students you are teaching, sometimes you meet them and they say “We are your students” while I don't know that those are my students, something which is not good [...] those who never attend class, to know them is not too easy. You give them attendance list they sign for everyone; it is not easy to control such kind of things”.

Limited personal interaction with students: Large classes cannot facilitate to individualize teaching and to identify weak students from stronger one. Students reported that while teaching a big number of students, the amount of interaction, the frequency with which students raise and answer question is much less when a small class is involved. Students also acknowledged feeling isolated and anonymous when they are attending classes in large numbers.

Student's engagement in learning: this study showed that large class cannot facilitate to individualize teaching and to identify weak students from stronger ones because of limited personal interaction with students, limited time and space to work with everyone. One student revealed that in crowded classrooms, lecturers often focus on students sitting in front of them, leaving alone the ones sitting behind who are not allowed to express themselves. These students sometimes admit not being motivated to ask questions even if they have some. Findings from this study also showed that the problem of large classes become more sensitive when classes involve doing practical activities especially for science students, like providing “samples of animals to each student for dissection” or “availing a computer for every student to work on it and be challenged by provided exercise.

Limited access to online teaching materials and library resources: The large number of students in some specific teaching subjects prohibits students from accessing internet, ICT tools and other library resources. Findings from this study revealed that, access to ICTs tools and other online materials is constrained by large classes. A lecturers reported that:

“...If your class involves practices, you can't do it. It would be cheating them because you need every student to work on a machine...”

Respondents also reported that the few existing ICTs resources are often confined in computer labs, the labs themselves are often closed in the evening and weekend hours when students are free to use them for personal readings or for the works assigned to them by lecturers.

Findings have also shown that the access to teaching materials and readings is frequently done via hard printed notes. The same situation prevails in the access to library where students reported the discomfort they face when they go to the library to look for books recommended by the lecturer and end up missing them because they are few in numbers compared to the large numbers of students in need.

Assessment of students' learning: Student's assessment was pointed out by all respondents as the most challenging aspect for active learning when large class environments are involved. One lecture lamented that, *"Let me be honest, when I am assessing, I am assessing papers, I mean I am assessing students that I don't know, and I have been teaching them for the whole semester."* Lecturers with large classes acknowledged assessing their learners bearing in mind the time to mark in order to meet the provided deadlines. Some even acknowledged deliberately skipping to assess learners with discussion and reflections questions and resort to setting exam questions which will allow the easy processing in terms of marking. In addition, the findings have also shown that the majority of lecturers handling large classes tend to provide group assignments instead of individual assignment which engage individual learners.

7.4. Proposed strategies to mitigate constraints to active learning in large classes at the UR-CE

Despite many challenges that both lecturers and students face while attending large classes, respondents contacted for this study came up with some strategies to minimize consequences or reduce these challenges.

Majority of lecturers opt to control classroom attendance and harmony by maintaining students on the pressure of classroom activities either by providing frequent readings and giving improvised and marked classroom assignment and presentations. In case of class presentations, most of them use for random selection of presenters. One of the lecturers said: *"students should not be given order of presentation or being informed of the group which will present first...choices should be done directly in the class where every student is obliged to attend regularly being ready to present first"*.

Some lecturers also strategize to maintain harmony in class by involving students' representatives in class management. *"It is a kind of making the whole class accountable as a group instead of getting one student, who is doing wrong"*, articulated another lecturer. Others strive to make the class more attractive and motivating distributing bonuses to students who attend class and participate actively in classroom activities.

Advance planning of classroom activities was another strategy reported by both lecturers and students to minimize challenges of attending large classes and this implies a sharing teaching support material before the class begins. According to the students' focus group discussion, lecturers come in class, divide all the module chapters to students' groups, ask them to read and work on them in order to organize classroom presentations where they will be intervening by giving the overall summary. However, findings from this study revealed that the majority of the other lecturers acknowledged not resorting to this strategy, the reason being that *"once students*

have handouts in hands, they disappear from class and rely on handouts without paying attentions to explanations provided by lecturers”.

8. Discussion

The findings to this study have shown that large classes constitute a real phenomenon at UR-CE. Hence, the discussion revolved around three main points.

The first concerns the urgent need for UR-CE to recruit more lecturers, mostly tutors, to reduce the staff/student ratios. This would facilitate both students and lecturers to attend class in small manageable groups of learners and by extension harness effective teaching and learning. By doing so, UR-CE would not only be respecting both national and international academic standards of education but also borrowing the scientific proof that large classes lead to *diminished quality of education due to lesser students' active engagement and participation in the learning process* (Kerr, 2011). Indeed, UR-CE would be fulfilling adequately its mission of lecturer education and training for Rwandan basic education sector because teaching large make the teaching and learning ineffective (Oliveira & Farrel, 1993) and encourage absenteeism of students from the work (Blatchford; et al., 2002).

The second point that emerged from the findings is to embrace New Information and Communication Technologies in classroom delivery because they hold the power to alleviate barriers related to big task of managing large classes. These may include laptops, videotape recorders, and flash disks and so on. UR-CE was urged to facilitate all students to access ICTs. This can be done by facilitating both students and lecturers to access internet facilities, increasing the number of computers labs and equip them with sufficient computers connected to internet.

In the same vein, strategies should be taken to keep the labs accessible to students all days. In this perspective, these technologies would enhance teaching-learning interactions (Cuseo, 2007) and put end to the bad experience of squeezed seats or benches in the front sides of the class (Al-Jarf, 2006; Shamim; et al., 2007) imposed to students while seeking for a place where they would hear the lecturers and see well on the chalkboard. The same technological venture would facilitate the shift from traditional chalk-talk practice to an ICT-mediated education.

The third and last point revolves around the fact that large classes constitute a challenge to individualize learning and provide feedback to students (Cuseo, 2007). Indeed, large classes lead students to develop abnormal and disrupting ways of conducts (Shamim; et al. 2007), affected pupils' progress (Cuseo, 2007) and make it difficult for teachers to identify students' problems and provide them with appropriate and immediate feedback on an individualized basis (Blatchford, et al. 2002). Hence, it is suggested to use traditional pedagogical approaches that enhance learning while teaching large classes at University of Rwanda-College of Education.

9. Conclusion

This study underlined the conviction that active learning is the leading pathway to impart knowledge and enable effective teaching-learning to take place at all levels of education including higher education. In Rwandan context, this study considered University of Rwanda-College of Education (UR-CE); the unique public, specialized and mandated teach education hub. The backdrop to this study has been motivated by the fact that this teacher education institution should train teachers in conditions that make them capable to practice active pedagogy once they join the teaching profession. Nonetheless, the findings to this study revealed the issue of large classes a reality that makes practicing active learning approach at University of Rwanda-College of Education (UR-CE) impossible. This situation is likely to hinder adequate training of teachers to use active learning. Therefore, there is a desperate need to reduce the class size across education modules and other crosscutting modules. This would require the college leadership to increase the number of lecturers and avail more classrooms/lecture halls. It is also recommended to introduce the culture of teaching-learning beyond the physical classroom, whereby the interaction between lecturers and learners would be ICT mediated. In the end, lecturers are called to use renowned pedagogical approaches such as:

- (i) To increase students' activities through think-pair-share, collaborative and peer learning;
- (ii) To organize classes ahead of teaching, maintain students' attention and set classroom rules to minimize disruptive behaviors; and
- (iii) To use of interactive teaching approaches that make students active during live lectures.

References

- Al-Jarf, R. (2006). *Large student enrollments in EFL programs: Challenges and consequences*. *Asian EFL Journal Quarterly*, 8 (4), 8-34.
- Babbie, E. (2001). *The Practice of Social Research: 9th Edition*. Belmont, CA: Wadsworth Thomson
- Blatchford, P., Moriarty, V., Edmonds, S., & Martin, C. (2002). Relationships between class size and teaching: A multimethod analysis of English infant school. *American Educational Research Journal*, 39 (1), 101-132.
- Bloom, D., Canning, D. & Chan, K. (2006). *Higher Education and Economic Development in Africa*. Harvard University. Retrieved from <http://ent.arp.harvard.edu/AfricaHigherEducation/Reports/BloomAndCanning.pdf>
- Bonwell, C. C., & Eison, J.A. (1991). *Active learning: creating excitement in the classroom*. ASH#-ERIC Higher Education Report No. 1, Washington, D.C.: The George Washington University, School of Education and Human Development.
- Bransford, J.D., Brown, A.L., & Cocking, R.R. (Eds.) (1999). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academy Press.
- Blatchford, P., Moriarty, V., Edmonds, S., & Martin, C. (2002). Relationships between class size and teaching: A multimethod analysis of English infant school. *American Educational Research Journal*, 39 (1), 101-132.
- Cuseo, J. (2007). *The empirical case against large class size: adverse effects on the teaching, learning, and*

- retention of first-year students. Retrieved from <https://wiki.doit.wisc.edu/confluence/download/attachments/20938768/Cuseo.pdf>
- Effah, P. (2005). *Private higher education: an analysis of its growth and expansion in African Countries*. UNESCO. Ed. N.V. Varghese. Paris.
- Finn, J. D., Pannozzo, G. M., & Achilles, C. M. (2003). The "why's" of class size: Student behavior in small classes. *Review of Educational Research*, 73 (3), 321- 368.
- Haddad, D. W. (2002). *ICTs for Education, A Reference Handbook Part 2: Analytical Review*. Retrieved from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/11/28/000333038_20081128022708/Rendered/PDF/466440WP0vol1011Education1Resources.pdf
- Herington, C., & Weaven, S. (2008). Action research and reflection on students' approaches to learning in large first year university classes. *The Australian Educational Researcher*, 35 (3), 111-134.
- Jawitz, J. (2013). *The challenge of teaching large classes in higher education in south Africa. A battle to be waged outside the classroom*. Retrieved from <https://pdfs.semanticscholar.org/f1c0/cd9cf7b2da6dcb68df3ee47661bf0bb3328a.pdf>
- Jungic, V., Kent D., & Menz, P. (2006). Teaching large math classes: three instructors, one experience in *International Electronic Journal of Mathematics Education*, 1(1). Retrieved from <http://maxwellsci.com/print/criss/v3-44-49.pdf>
- Kerr, A. (2011). *Teaching and learning in larger classes at Ontario Universities: An Exploratory Study*. Toronto: Higher Education Quality Council of Ontario. Retrieved from <http://www.heqco.ca/SiteCollectionDocuments/Teaching%20and%20Learning%20in%20Large%20Classes%20ENG.pdf>
- MacMillan, J. & Schumacher, S. (2006). *Research in Education: Evidence Based inquiry*, Pearson Education, inc, USA
- Mahadeo, D.M. (2012). Teaching and learning in large classes: overcoming the challenges with technology. *International Journal of Innovations in Business*, 1 (2). Retrieved from <http://www.cibmp.org/journals/index.php/ijib/article/view/7/14>
- Massiata, B. (2012). *Seeking effective approaches to teaching large classes in the Ivory Coast*. Indiana University of Pennsylvania retrieved from <http://dspace.iup.edu/bitstream/handle/2069/586/Massiata%20Bamba.pdf?sequence=1>
- Moodley, P., (2015). Student overload at university: large class teaching challenges: part 1. *South African Journal of Higher Education*, 29 (3), 150-160
- MINEDUC (2015). *2015 Education statistics Yearbook*. Ministry of Education. Kigali. Retrieved from https://mineduc.gov.rw/fileadmin/user_upload/Amatangazo/2015%20Education%20Staiatical%20YearbookF.pdf

- MINEDUC (2018). *2018 Education statistics Yearbook*. Ministry of Education. Kigali. Retrieved from http://mineduc.gov.rw/fileadmin/user_upload/pdf_files/2018_Rwanda_Education_Statistics.pdf
- Mohamedbhai, G. (2008). *The effects of massification on higher education in Africa*, retrieved may, 08, 2014 from <http://ahero.uwc.ac.za/index.php?module=cshe&action=downloadfile&fileid=18409092513202791624126>
- Nayak, A.K. & Rao, V.K (2004). *Classroom teaching methods and practices*, S.B Nagia, New Delhi
- Obanya, P. (2004). *Educating for the Knowledge Economy*. Ibadan. Mosuro Publishers. Ibadan.
- Oliveira, J. B. & Farrell, J. P., (1993). *Lecturers in developing countries: Improving effectiveness and managing costs*. EDI Seminar series. Washington
- Onwu, G. (1999). *Inquiring into the concept of large classes: emerging typologies in an African context*. In Savage M & Naidoo P (eds). *Using the local resource base to teach science and technology: Lesson from Africa*. AFCLIST.
- Ozturk, I. (2001). The role of education in economic development: a theoretical perspective. *Journal of Rural Development and Administration*, 33 (1), 39-47. Retrieved from <http://mpra.ub.uni-muenchen.de/9023/>
- Saba, F. (2012). *Factors Affecting the Future of Higher Education: Increased Demand*. Retrieved from <http://distance-educator.com/factors-affecting-the-futre-of-higher-education-increased-demand/>
- Sekiwu, D. (2009). *Strategies of coping with effective teaching and learning in large classes in Secondary Schools in Kampala District*. Retrieved from <http://files.eric.ed.gov/fulltext/ED505028.pdf>
- Shamim, F., Negash, N., Chuku, C., & Demewoz, N. (2007). *Maximizing learning in large classes: Issues and options*. Addis Ababa, Ethiopia: British Council.
- UNESCO, (2000). *The state of education in Nigeria*. UNESCO, office Abuja retrieved from <http://unesdoc.unesco.org/images/0014/001495/149503eo.pdf>
- University and College Union (2010). *Student: lecturer ratios in higher and further education*. Retrieved from <http://www.ucu.org.uk/index.cfm?articleid=4624>