



AN EXPLORATORY SURVEY OF UNDERGRADUATE STUDENTS' ATTITUDES TOWARDS RESEARCH IN INES-RUHENGERI IN RWANDA

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ABSTRACT

This paper presents findings of a cross-sectional exploratory survey of Undergraduate students' attitudes towards research in INES-Ruhengeri in Rwanda. Data were collected on a convenient sample of 240 students using Papanastasiou's (2014) Revised-Attitudes towards Research Scale. Descriptive and inferential statistics were used to analyse the data. The study found that the levels of the students' attitudes were high in the factors of usefulness of research and the positive predispositions to research. However, in the factor of anxiety and in overall, the levels were moderate. Females were more anxious than males and in the rest of the factors, males showed higher levels than females. However, despite these differences, the t-test revealed that there is no statistically significant gender-based difference. In academic year 2016, students' attitudes were higher than they were in 2017 in all the Factors. However, despite these differences, the t-test revealed that there is no statistically significant difference based on academic years. Part-time students' attitudes were higher than those of full time students and the t-test revealed that there were statistically significant differences based on mode of delivery of the programs in the factors of anxiety, positive disposition to research and overall attitudes. Nevertheless, the differences were weak according to Muijis (2004).

KEY WORDS: Attitude toward research; Research anxiety; positive attitudes, negative attitudes, gender-based significant differences

INTRODUCTION:

INES-Ruhengeri is a private Institution of Higher Learning with an orientation of Applied Sciences. In this perspective, INES-Ruhengeri has to deal with the three classical activities of such an Institution, namely, Teaching, Research and Community Services. Faculty members and Students are two main groups who conduct research in Higher learning Institutions. For Faculty members, research plays an important role in assisting them to deliver update knowledge to students. In addition, research production is a basic element that contributes to the promotion of Faculty members as far as academic ranks. Students also play an important role in research process since they need to submit thesis or dissertation for fulfillment conditions of award of a degree.

At INES-Ruhengeri, students are engaged in research through two courses, the first course is done in first year as an introduction to research skills and ICT and the course in fourth year on research methodology to prepare them to the production of their dissertations in order to partially fulfill requirements for the award of the Bachelor's degree in their learning options. The research leading to their memoirs is done after they have finished all the required courses including the research methodology course in which they are introduced the key concepts, types and steps of research, various research methods and techniques of collecting and analyzing data, reporting research and references styles. This exploratory survey has been conducted at the end of the research methodology course before they sit for the final examination of the module

Students' attitudes have interested various researchers all over the world under the hypotheses that students exhibit anxiety towards the discipline under investigation and seem to dislike it. Students' attitudes towards Mathematics interested many authors some of which are found in Habineza (2016); Students' attitudes towards statistics have also been worked on (Eduljee & LeBourdais, 2015; Onwuegbuzie & Wilson, 2003). Students' attitudes towards research which is the object of the study have also been dealt with (Papanastasiou, 2005, 2006, 2014; Papanastasiou & Schummaker, 2014; Deniz & Citak, 2010; Siemens, Punnen, Wong & Kanji, 2010; Butt & Shams, 2013; Manuel, Fenton & Philemon, 2013; Rezaei & Zamani-Miandashti, 2013; AlGhamdi, Moussa, AlEsa, AlOthimeen, Adwa & Al-Saud, 2014; Shaukat, Siddiquah, Abiodullah & Akbar, 2014; Welch, Jacks, Smiley, Walden, Clark & Nguyen, 2015; Meraj, Gul, Zubaidazain, Akhter, Iram, Salam Khan, 2016; Adaboh, Akpalu & Appiah, 2017; Daniel, Kumar & Omar, 2017). Research Methods with statistics also attracted some researchers (Li, 2012). Finally, the attitudes of students towards computers also attracted attention of some researchers (Isman, Caglar, Dabaj, Altinay & Altinay, 2004; Fancovicova & Prokop, 2008; Amoo, Hambali & Amoo, 2015) and the list can be extended.

After exploring the literature on students' attitudes towards each of the preceding subjects, I got interested on studying students' attitudes towards mathematics and research. In 2016, I explored INES-Ruhengeri students' attitudes towards Mathematics to better understand how attitudes play an important role in learning and teaching Mathematics. In this current paper, I am applying Papanastasiou's (2014) scale to study attitudes towards research for students, both females and males who were studying in INES-Ruhengeri in the departments of Computer Science, Civil Engineering, and Land Survey during the academic years 2016-2017 and 2017-2018.

LITERATURE REVIEW:

In many studies on students' attitudes towards research, terms like research, research anxiety and positive and negative attitudes towards research have to be defined at the outset of the study. Rezaei & Zamani-Miandashti (2013) defined research as follows:

Research is the systematic process of collecting and analyzing information to increase a human understanding of the phenomenon under study. In other words, research is a process comprised of data collection, analysis, interpretation, and assessment procedures conducted in a planned manner in order to find solutions to a problem. (p. 69)

On his side, Kothari (2004), referring to Clifford Woody, listed components of research as below:

Research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organising and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis (p.1)

Furthermore, Kothari (2004) clarified the difference between research methods and research methodology saying that Research methods are "all those methods/techniques that are used for conduction of research" (p.7) whereas Research methodology is "a way to systematically solve the research problem... It is... a science of studying how research is done scientifically" (p.8).

Forester, Kahn and Hesson-McInnis (2004) defined research self-efficacy as "one's confidence in successfully performing tasks associated with conducting research (e.g., performing a literature review or analyzing data)" (pp. 3-4). They identified also four dimensions for research self-efficacy which include data analysis (i.e., confidence in one's ability to work with and analyze data), research integration (i.e., confidence in one's ability to integrate one's research ideas with the existing literature), data collection (i.e., confidence in one's ability to complete data collections tasks such as training raters and keeping accurate records), and technical writing (i.e., one's ability to write research articles for publication) (Rezaei & Zamani-Miandashti, 2013).

Higgins and Kotrlík (2006) said that research anxiety refers to the characteristics which a student perceives as discomforting to the extent that productivity may be reduced.

Rezaei & Zamani-Miandashti (2013), noted that negative attitudes constitute obstacles to learning and hampers sustained efforts in research. In the contrast, positive attitudes enable students to work resiliently until they find solutions to assigned task or research problem. They finally affirmed that the enhancement of positive attitudes toward research is one of the key components that impacts students' research self-efficacy (Forester, Kahn & Hesson-McInnis, 2004). For them, it is of a great importance for future educational development to investigate students' attitudes towards research.

In this line, a number of researches from different Higher Learning Universities have been conducted to study students' attitudes towards research and turned

around some constructs like usefulness, positive and negative attitudes and anxiousness caused by research to measure their levels. These studies analysed also the statistically significance of differences based on some independent variables such as gender, types of university, school, department, academic year and so on. Some of the studies found that students' attitudes were positive; others found that they were negative. On the other side, they found that there are significant differences among given categories of students on one side and others found the contrary on the other side.

In this regard, Siemens et al. (2010) found that there were significant differences in attitudes towards research in medical school between students in their fourth year compared to second year. Butt & Shams (2013) found that student teachers have a negative attitude towards research and that a significant difference exists in the attitudes with respect to the type of program and prior areas of specialization; they found that students enrolled in self-supported evening programs have significantly better attitudes towards research than those enrolled in morning programs.

Similarly, Shaukat et al. (2014) found that the males had significantly positive attitudes towards research than the females and significant differences were found on age, different programs of study, and University type. Also, Hussain et al. (2016) found that students had a positive attitude towards research and also they noted that there were insignificant difference between male and female students attitudes towards research.

In contrary, Adaboh et al. (2017) found that there were no statistically significant differences among nursing students from B.Sc Nursing program and education students from B.Ed. program.

On their side, Bandle and Adebule (2013) found that research work made students anxious, nervous, bored, scared and that they would not have enrolled for the course if opportuned. They also found that irrespective of type of gender and faculty of the students they were similar in their pattern of attitude to research work. They also found that almost all the graduating students had negative attitude towards research work which was not a welcomed development if a nation was to have a breakthrough in technology and research. Oguan et al. (2014) also found that students had a positive attitude towards research and that the male students were more positive compared to their female counterparts. In addition, they mentioned that students showed anxiousness towards research and admit that it was stressful.

In the same perspective, Manuel et al. (2013) found that more psychology than sociology students had positive attitudes towards the learning of quantitative research methods and Meraj et al. (2016) found that students enjoyed research; however, they found that some of them perceived research as stressful and complex.

Daniel, Kumar & Omar (2017) oriented their research in the qualitative perspective and noted that some postgraduate students recognized that research methodology was a set of knowledge which needed to be learnt while others considered learning research methodology as an acquisition of isolated facts and skills which is not a discipline as a whole. They reported that students faced challenges on understanding some topics of research methodology. Such topics included framing research questions, understanding the theory or literature and its role in shaping research outcomes, and difficulties in performing data analysis.

Similarly to what have been found by some of the above mentioned researchers, students at INES-Ruhengeri seem to have high level of anxiety towards research and appear to dislike it. This situation may hamper learning and doing research in the long run. Exploring INES-Ruhengeri students' attitudes towards research may contribute to identify what modifications can be made to knowledge, skills, behaviors, attitudes and values in order to assist students to learn confidently the course of Research methodology.

OBJECTIVES:

The objective of the study was to assess the undergraduate students' attitudes towards research and to determine whether there were significant differences based on gender, academic years or department or mode of attending the program (full-time students versus part-time students).

Research questions:

1. At which levels, the students enjoy research, find it useful or are anxious about it? What are their overall attitudes towards research?
2. Is there any significant difference between male and female students of the considered departments
3. Is there any significant difference based on the department under consideration?
4. Is there any significant difference based on academic year (2016-2017, 2017-2018)?
5. Is there any significant difference based on mode of delivery (full-time and

part-time)?

HYPOTHESES:

H01: There is no significant gender-based difference in the considered departments

H02: There is no significant difference of students' attitudes based on belonging to any departments

H03: There is no significant difference of students' attitudes based on academic years 2016 and 2017.

H04: There is no significant difference based on mode of delivery (full-time and part-time)

METHODS:

Design:

This study was designed as cross-sectional survey to explore attitudes of undergraduate students towards research and to compare their levels based on their personal information. The independent variables were gender, department, academic year, mode of attending the courses. The dependent variables grouped into three factors (Papanastasiou, 2014) were the following:

Factor of Usefulness:

1. Research is useful for my career;
2. Research is connected to my field of study;
3. The skills I have acquired in research will be helpful to me in the future;
4. Research should be indispensable in my professional training;

Factor of Anxiety:

5. Research courses make me anxious;
6. Research courses scare me;
7. Research courses are stressful;
8. Research courses make me nervous;
9. Research courses are difficult;

Factor of Positive predisposition:

10. I enjoy my research course;
11. I love research courses;
12. I find research course interesting;
13. Research course are pleasant.

Population:

The population under investigation included Full time undergraduate students from the departments of Computer Sciences who took the course of Research methodology during the year 2015-2016, Full time undergraduate students of the department of Civil Engineering who took the course during the academic year 2015-2016 and Part-time students of this department who took the course in the academic 2016-2017, and Full time students from Land survey department who took the course in the academic year 2016-2017. The Teacher who taught the research methodology course was the same for all involved students during the two consecutive academic years.

Sampling Technique:

A convenience sampling technique was used to get the research sample for this study. A total of 240 student's from the above mentioned departments participated in the study. The table 1 presents the numbers of students dis-aggregated by Department, Gender, Academic Year and Mode of Delivery of the Programs.

Table 1: Number of participants by department, gender, academic year and mode of delivering the program

Department	Gender		Total	2016		2017	
	Male (%)	Female (%)		Full time	Part time	Full time	Part time
Computer Science	14 (70)	6 (30)	20	20	0	0	0
Civil Engineering	103 (85)	18 (15)	121	90	0	0	31
Land survey	78 (79)	21(21)	99	0	0	99	0
Total	195(81)	45(19)	240	110	0	99	31

Instrument:

The Papanastasiou's (2014) Revised Attitude towards research (R-ATR) scale was used to measure the students' attitudes. The R-ATR consists of 13 items measured on a 7-point Likert scale in which the 1 indicates a response of 'strongly disagree', while the value of 7 corresponds to 'strongly agree'. The revised scale has three factors, each comprising a number of dependent variables as mentioned in the design section.

Data collection:

The questionnaire was administered in settings of Exam while the students were seated on a classroom arranged for them to do the exam of Research methodology. They responded to the questionnaire before they start the exam.

Data analysis:

Descriptive and inferential statistics (Cohen, 1988) were produced using the Statistical Package for Social Sciences (SPSS) version 20.0. The t-test for comparison of mean scores was used to test the gender-based significant difference between female and male students, two consecutive academic years in the department of Civil Engineering and full time and part-time students. The ANOVA test was used to test whether there were significant differences among departments. During the analysis of the answers of the items of the research anxiety were reversed (8 - The answer of the student) to allow a correct interpretation of the attitudes.

The statistically significant differences were tested at $p=0.05$ and where necessary, effect size was interpreted using eta squared as categorized by Muijss (2004) who said that Eta squared varies between 0 and 1 and when eta squared is between 0 and 0.1 the effect is weak; when eta squared is between 0.1 and 0.3 the effect is modest; when it is between 0.3 and 0.5 the effect is a moderate and when it is greater than 0.5, the effect is strong.

Regarding the levels of attitudes, I determined four intervals, in which the levels of attitudes can be interpreted referring to the 7-point Likert scale described above: [1, 2.75]: low level; [2.75, 3.5]: modest level; [3.5, 5.25]: moderate level and [5.25, 7]: high level.

RESULTS:

Tables below present findings related to the average means scores and average standard deviations of each factor; they present also the results on testing the mean scores differences on students' attitudes obtained by applying t-test and one way analysis of variance (ANOVA).

Table 2: t-test for comparison of Mean scores of Males and Females students' attitudes dis-aggregated by Factors and by Gender

Factors	Gender	N	M	SD	t	p
Anxiety	Male	195	4.34	1.35	-.194	.847
	Female	45	4.38	1.21		
	Total	240	4.34	1.32		
Usefulness	Male	195	5.72	1.31	.593	.554
	Female	45	5.60	1.34		
	Total	240	5.70	1.31		
Positive predisposition	Male	195	5.71	1.31	.058	.953
	Female	45	5.70	1.41		
	Total	240	5.71	1.32		
Over all attitudes	Male	195	5.19	1.00	.166	.868
	Female	45	5.16	0.96		
	Total	240	5.18	0.99		

Table 2 shows that considering the average mean scores and the scale that I set above referring to Muijss (2004), levels of the students' attitudes who participated in the study are high in the factors of usefulness of research and the positive predispositions to research. However, in the factor of anxiety and in overall, the level is moderate. In further details, females are more anxious than males; moreover, the table 2 shows that male ranked research as more useful than females; furthermore, males are more positively predisposed to research; and finally, in overall, males have higher attitudes than females. However, despite these differences, the t-test revealed that there is no statistically significant gender-based difference since p is greater than 0.05.

Table 3: t-test for comparison of Mean scores of students' attitudes dis-aggregated by Factors and by Academic Year

Factors	Academic year	N	M	SD	t	p
Anxiety	2016	110	4.47	1.20	1.44	.152
	2017	130	4.23	1.41		
Usefulness	2016	110	5.62	1.08	-.804	.422
	2017	130	5.76	1.48		
Positive predisposition	2016	110	5.72	0.97	.108	.914
	2017	130	5.70	1.57		
Over all attitudes	2016	110	5.21	0.77	.452	.652
	2017	130	5.15	1.34		

Table 3 shows that in consideration with the mean scores, students in 2016 were more anxious than students in 2017. Moreover, students in 2017 ranked research more useful than student of 2016. Furthermore, students in 2016 were more positively predisposed to research than students in 2016. Finally, in overall, students in 2016 revealed higher positive attitudes than students in 2017. However, despite these differences, the t-test revealed that there is no statistically significant difference based on academic years since p is greater than 0.05.

Table 4: t-test for comparison of Mean scores of students' attitudes dis-aggregated by Factors and by Mode of delivery of programs

Factors	Mode of Delivery	N	M	SD	t	p	Eta squared
Anxiety	Full time	209	4.25	1.25	-3.01	0.003	0.037
	Part time	31	5.00	1.61			
Usefulness	Full time	209	5.64	1.32	-1.67	0.96	-
	Part time	31	6.06	1.17			
Positive predisposition	Full time	209	5.62	1.33	-2.72	0.007	0.030
	Part time	31	6.31	1.15			
Over all attitudes	Full time	209	5.10	0.95	-3.39	0.001	0.045
	Part time	31	5.13	1.07			

Table 4 shows that in consideration with the mean scores, part time student are more anxious than full time students. Moreover, part time students ranked research as more useful than part time students. Furthermore, part time students were more positively predisposed to research than full time students. Finally, in overall, part time students revealed higher positive attitudes than full time students. In addition to the preceding differences, the t-test revealed that there were statistically significant differences based on mode of delivery of the programs in the factors of anxiety, positive disposition to research and overall attitudes in which p is less than 0.05.

However, the differences were weak according to Muijss (2004) as the eta squared is between 0 and 0.1.

Table 5: One-way ANOVA for attitudes towards research Across Departments

Factors	Computer science (N=20)		Civil engineering (N=121)		Land Survey (N=99)		ANOVA	
	M	SD	M	SD	M	SD	F	P
Anxiety	4.15	1.25	4.66	1.31	3.99	1.26	7.740	0.001
Usefulness	5.85	0.77	5.70	1.15	5.66	1.31	0.162	0.851
Positive predisposition	5.90	0.69	5.84	1.08	5.51	1.63	1.915	0.150
Over All ATR	5.21	0.54	5.34	0.93	4.97	1.10	3.903	0.021

Table 5 displays results in which significant mean scores differences were observed in factor of anxiety and in the overall attitudes. Post hoc test revealed that participants of Civil Engineering were significantly more anxious than participants of Land Survey. However, the effect size was low (0.061) according to Muijss (2004). In the same perspective, participants of Civil Engineering held significantly more positive attitudes than participants of Land Survey with low effect size (0.0319) according to Muijss (2004). The post-hoc test did not reveal any significant differences between participants from Computer Science and those from the other two departments.

DISCUSSION:

The study was carried out to determine the levels of students' attitudes towards research and to find out whether there were significant differences based on gender, department, academic years or mode of delivery of the programs.

In accordance with Oguan et al. (2014), the study found that males have higher attitudes than females. The study noted that the students' attitudes were positive since they were at the high level of the scale, either moderate or high. However the study found that students expressed some anxiety towards research as also noted by Bandle and Adebule (2013) and Meraj et al. (2016).

In contrast with Shaukat et al. (2014) and Hussain et al. (2016), the study found that there was no gender-based statistically significant difference in attitudes toward research. However, in accordance with Shaukat et al. (2014), the study found that there were significant differences on different programs of study, namely in Civil Engineering and Land survey programs. This is in contrast with Adaboh et al. (2017) who found that there were no statistically significant differences among nursing students from B.Sc Nursing program and education students from B.Ed. program

Also, in accordance with Butt & Shams (2013), this study found there was significant difference of attitude towards research between students attending the course in Week days (full time) and those attending the course in Week End (part time.). Part time students had significantly better attitudes towards research and less anxious than those enrolled in Full time students. This difference is in line with the hypothesis that part time students are more committed than full time students

Measuring students' attitudes towards research is necessary as it can have an impact on how Teachers of research methodology course, Supervisors of Undergraduate dissertations and even graduate theses can adjust their modus operandi to improve the research productivity of their students. The present study sought to conclude this discussion by advising that Teachers in INES-Ruhengeri continue assisting students to increase their attitudes' levels towards research. For this to happen, there is a great need to envisage strategies to reduce students' anxiety towards research and avoid that research makes them nervous, bored, scared and regretting at the level of willing leaving the course if they were given an opportunity (Bande & Adebule, 2013).

By exploring continuously students' attitudes towards research, Lecturers of the research methodology course and Supervisors of students' dissertations may be able to identify what adjustments to knowledge, skills, behaviors, attitudes and values are required to assist the learning of research and foster a positive appreciation of this subject in students (Shaukat et al., 2014; Daniel et al., 2017).

CONCLUSION:

The study explored the levels of students' attitudes towards research using three factors identified by Papnastasiou (2004) and analysed statistically significant differences based on gender, department, academic year and mode of delivery of the programs of Computer Science, Civil Engineering and land survey at INES-Ruhengeri in Rwanda. The study found that the levels of the students' attitudes who participated in the study were high in the factors of usefulness of research and the positive predispositions to research. However, in the factor of anxiety and in overall, the levels were moderate.

With regard to gender, females were more anxious than males and in the rest of the factors, males were higher than females. However, despite these differences, the t-test revealed that there is no statistically significant gender-based difference. Concerning the academics years, students' attitudes in 2016 were higher than students' attitudes in 2017 in all the Factors. However, despite these differences, the t-test revealed that there is no statistically significant difference based on academic years.

With regard to mode of delivery of the programs, levels of attitudes of part time students were higher than those of full time students and the t-test revealed that there were statistically significant differences based on mode of delivery of the programs in the factors of anxiety, positive disposition to research and overall attitudes. However, the differences were weak according to Muijis (2004) as the eta squared is between 0 and 0.1. With regard to departments, the study showed significant mean scores differences in factor of anxiety and in the overall attitudes. Post hoc test revealed that participants of Civil Engineering were significantly more anxious than participants of Land Survey with low effect size and in the same perspective, participants of Civil Engineering held significantly more positive attitudes than participants of Land Survey with low effect size.

Research limitations and Implication for Future Studies:

One limitation of this study was that it was based on a convenience sample and sometimes, there was an unbalance for some sampled students for some independent variables like department and mode of delivery. The students' attitudes towards research in others departments are unknown, which limits generalization of findings. Another limitation is about the design of the study which was of the type of a cross-sectional study where data are collected at one given time only. A longitudinal study would be more advisable as it would allow the observation of the process of students' attitudes change over time.

Also, such longitudinal study should include a qualitative component to find out various ways on how students could be better assisted in order to reduce their anxiety and increase their attitudes' levels while learning research courses. Such study should also include the identification of what teachers' modifications to knowledge, teaching methodologies, behaviors, attitudes and values are required to assist the learning of research methodology and foster a positive appreciation of this subject in students. An action research approach, with many cycles of planning, acting, reflecting and evaluating, may be envisaged to solve the above limitation on cross section study versus longitudinal study.

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