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Mediation Effect of Research Skills Proficiency on the Core Self-Evaluations – Research Engagement Relationship among Master of Education Students in Uganda

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Abstract
This study investigated the mediation effect of research skills proficiency on the relationship between core self-evaluations and research engagement among Master of Education students in Uganda. Questionnaire surveys including closed ended questions were administered to two cohorts of the students, 2011/2012 and 2012/2013, (N = 102). Results indicated total mediation effect of research skills proficiency on the relationship between core self-evaluations and research engagement. Implications for educational practice include careful selection and training of adult learners at master's level on the basis of their core self-evaluations levels; individuals with positive core self-evaluations should be accorded priority entry into the programme. Implications for future research include carrying out intervention studies on how to effectively impart 21st century skills in the adult learners.
Keywords: Core self-evaluations, Research skills proficiency, Research engagement, Mediation effect, Master of Education, Uganda, 21st century skills

1. Introduction

There is growing evidence of the need amongst employees for a more complex combination of skills than in the past (Remali, Ghazali, Kamaruddin, & Kee, 2013) including mathematical, information and communication, and workplace-specific skills. These new skills include multimodal communication, collaborate writing, online networking, and one to one mobile computing. Improved skills result in improved earnings and savings. The corporate world expects their employees to amass these skills from the education system, especially through acquisition of higher degree qualifications. For the Master of Education students who double as employees, acquiring these skills presents challenges as universities often assume that these are a do for undergraduate programmes. Unfortunately, without a threshold level of competency in these skills, research engagement is hampered among the students.

Trilling and Fadel (2009) argue that today's student should be able to communicate clearly, collaborate with others, think critically and solve problems, and create and innovate. Clear communication entails several aspects. These include articulating thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts; listening effectively to decipher meaning, including knowledge, values, attitudes and intentions; using communication for a variety of purposes [e.g., to inform, instruct, motivate and persuade]; utilizing multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact; and communicating effectively in diverse environments including multi-lingual.

In addition to the technological skills, skills such as oral communication, working with others, and continuous learning are considered very important in social capital frameworks. The Organization for Economic Co-operation and Development's (OECD, 2008) key competencies include social/soft skills such as the ability to relate well to others, the ability to cooperate and the ability to manage and resolve conflicts, for which communication skills are an essential requirement. These skills would enable the student to coordinate well with fellow students, supervisors, and other resource persons who could be of help to them in the research process.

In many African countries including Uganda, the academic progression of Master's degree students is characterised by serious internal inefficiencies as reflected by high dropout rates, high repetition or retake rates, longer completion times, low graduation rates, and to a lesser extent transfer between programmes (Farrar, 2013). These inefficiencies are coupled with poor quality of outputs including low scores in course work, examinations, and research work. Such progress deficiencies are attributed to various programme, environmental, and student

quality factors, although many disciplinary and other complex factors too contribute to these outcomes. Most of these factors are cross-cutting and generic issues affecting all students in the same cohort. The factors establish the social context which sets the stage for student decision making and provides unique pathways to learning that depend on family, peers, culture, life events, and teachers (Toshalis & Nakkula, 2012).

However, as noted by Judge and Hurst (2006), in any analysis of the source of psychological states and behaviour in reacting to the same or different environmental situations, one must consider the strong possibility that some individuals are born with predispositions toward positive feeling and behaviour while others are not. In this respect, inherent psychological student factors act to distinguish among the different student personalities as to whether they will appraise the environmental factors positively or negatively, hence affecting how they progress with their research. The main internal psychological student factors considered in this study are core self-evaluations.

Core self-evaluations refers to a person's deep-seated, fundamental, inner cognitive ratings of himself or herself (Judge, Locke, & Durham, 1997). As a core trait, the core self-evaluations construct is a fusion of four traits: self-esteem, locus of control, neuroticism, and generalised self-efficacy. Judge and Hurst (2006) have found out that the four traits have lots more commonalities and overlap than differences, in terms of convergent validity, incremental validity, discriminant validity relative to other traits, and lack of discriminant validity amongst themselves. In this regard, consideration of the traits in isolation would lead to underprediction and semantic confusion (Dewey, 1974 as cited in Judge & Hurst, 2006). In order to overcome such effects, Judge, Erez, Bono, and Thoresen (2003) converged the four core traits to indicate the higher order latent core self-evaluations concept. The concept can be measured on a positive-negative continuum.

Students with positive core self-evaluations are known to appraise themselves in a consistently positive manner across situations, seeing themselves as capable, worthy, and in control of their lives (Judge & Hurst, 2006). In line with the approach/avoidance framework (Elliot & Thrash, 2002) derived from Deci and Ryan's (1985) Self-Determination Theory, such students are expected to be motivated enough to exert more effort in achieving their goals in family life, work life, social life, personal life, and study life in a manner that leads to positive conclusions. In addition, they should highly engage in physical, emotional, and cognitive activities during research and thus have high research engagement.

Research engagement is defined as the feeling of positive emotions toward research work; investing personal resources, energy, and time in doing research as a meaningful activity; considering the research workload to be manageable, whilst taking advantage of collaborative, faculty, and institutional support; and having hope that the research work will attract better opportunities in future (Ram & Prabhakar, 2011). According to Zekpe, Leach, and Butler (2010), research engagement involves students' cognitive investment in, active participation in, and emotional commitment to their learning. Measured on a high-low continuum, research engagement entails active use of emotions and behaviours in addition to cognitions in undertaking research. High research engagement is characterised by energy, involvement, and efficacy as opposed to low research engagement characterised by burnout and intentions to quit; evidenced by exhaustion, cynicism, and inefficacy.

Zekpe et al. (2010) provide five benchmarks of learner engagement, namely (a) motivation and agency, (b) transactional engagement, (c) institutional support, (d) active citizenship, and (e) non-institutional support. According to Price and Tovar (2014), the benchmarks most closely associated with degree or certificate attainment are active and collaborative learning, academic challenge, and student faculty interaction. Active and collaborative learning would involve demonstrating the ability to work effectively and respectfully with diverse teams, exercising flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal, assuming shared responsibility for collaborative work, and value individual contributions made by each team member (Trilling & Fadel, 2009). These communication and collaboration skills can be learned through a variety of methods (e.g., project-based learning, problem-based learning, and design-based learning). Research on teaching communication and collaboration skills encourages direct and mediated communication, working with others on team projects, and performance-based learning and assessment (Ananiadou & Claro, 2009).

In line with the Student Involvement Theory (Astin, 1999), the progress and achievement of students in research is expected to be directly proportional to the quality and quantity of the students' engagement in research. Consistent with the approach/avoidance framework of the Self-Concordance Theory (Elliot & Thrash, 2002; Sheldon & Elliot, 1998), high-core self-evaluations students are more likely to be autonomously motivated, be committed to concentrating on the positive aspects of their research, family, and work demands, and exhibit more internally regulated motivation, goal commitment, and persistence. Conversely, students with negative core self-evaluations would have lower research engagement.

However, a positive internal disposition is not a sufficient condition for engagement; a mastery of the requisite skills is important so as to translate the disposition into engagement. In this case, a high level of research skills proficiency is required to translate favourable core self-evaluations into research engagement.

Research skills proficiency is defined as a student's skilfulness in the command of fundamentals of computer applications, academic writing, data collection and handling, and communication skills deriving from practice and familiarity (Lewis, 2007). These skills include basic computer skills, academic writing, data handling, and information and communication skills. According to Pacific Policy Study Centre (2010) in its publication "21st Century Skills for Students and Teachers," students need to acquire and apply creative thinking, flexible problem solving, collaboration and innovative skills that are necessary for success in work and life.

According to Kearsley and Schneiderman's (1999) student engagement theory, students must be engaged in their academic work in order for effective learning to occur. This study therefore aimed to unveil how core self-evaluations would affect research engagement among Master of Education students in Uganda through indirect effects of research skills proficiency. Judge and Kamayer-Mueller (2011) advocate that in contemporary organizations employees need to be able to proactively build up a set of career skills over time, strategically finding opportunities to learn and grow, which will in turn lead them to become more valuable employees. Although research has yet to examine how core self-evaluations are related to progress in organizational career paths, there are reasons, basing on Hall (1996, 2002) cited in Judge and Kamayer-Mueller (2011), to believe that individuals with positive core self-evaluations will indeed be better suited to the contemporary career landscape than those who have less positive core self-evaluations. First, individuals with more positive core self-evaluations tend to perform their jobs more effectively and to be more goal directed. Additionally, those with higher self-regard may attain success based on their own desire to demonstrate their positive characteristics to themselves and others. Swann (2011) proposed in his self-verification theory that people seek out environments and interactions that enable them to maintain their self-views, even when those views are negative. This implies that positive core self-evaluations individuals will undertake skills search through pursuing higher qualifications to back up their verifications on the job. Basing on this, it was hypothesised (H) that research skills proficiency would significantly mediate the relationship between core self-evaluations and research engagement.

2. Methodology

2.1. Research Design and Instrument

Cross-sectional survey design was employed in collecting, organising, and presenting quantitative data from the Master of Education students because a single time frame was chosen for garnering the data from the different categories of the students engaged in the study. data were collected using a structured questionnaire. The questionnaire had sections including the biodata Section, the Core Self-Evaluations Scale, the Research Skills Proficiency Inventory, and the Research Engagement Scale. It was piloted before using for the main study so as to ascertain the psychometric properties, especially reliability, of the scales. Most researchers (e.g., Amin, 2005) posit that a Cronbach alpha reliability coefficient of at least .70 renders the instrument reliable.

The biodata section consisted of items seeking the age, sex, nationality, employment status, academic credentials, family background, religious affiliation, and the Master of Education study experience of the students.

The Core Self-Evaluations Scale developed by Judge, Erez, Bono, and Thoresen (2006) was adapted to measure the students' core self-evaluations. The instrument has a unitary measure constructed from self-esteem, neuroticism, generalised self-efficacy, and locus of control. The score obtained from the scale falls in either of high (or positive) or low (or negative) core self-evaluations. The scale comprises 12 items. The original instrument has good psychometric properties (Judge et al., 2006). However, the adapted version of the scale was pretested in a pilot study to establish its validity and reliability, and was found to be good for use.

The students' research engagement was investigated by using an adapted version of the Student Engagement Scale (Singh & Srivastava, 2014). The scale measures four constructs: active and collaborative learning, student effort, student-faculty interaction, and institutional support. The Cronbach alpha reliability coefficient of the subscales of the original instrument ranged from .81 to .84 while the content validity index of the original scale was .85. The pilot test revealed a > .70 Cronbach alpha reliability.

Items in the Research Skills Proficiency Inventory measured the students' proficiency in basic skills required during research. These included competency in basic computer skills; competency in academic writing skills; competency in data collection, management, and analysis skills; and information and communication skills. The pilot study revealed that the inventory and its subscales were reliable, with > .70 Cronbach alpha reliability coefficients. The score ranges and levels of the various instruments and their subscales are presented in Table 2.

Table 2. Score ranges and levels for the instruments used in the study.

Instrument	Subscales	Score ranges	Levels
Core Self-Evaluations Scale	Overall scale	12-36	Negative
		37-60	Positive
Research Engagement Scale	Overall scale	0-42	Low
		43-84	High
	Active and collaborative learning	0-23	Low
		24-45	High
	Student effort	0-5	Low
		6-9	High
	Student-faculty interaction	0-8	Low
		9-15	High
	Institutional support	0-8	Low
		9-15	High
Research skills proficiency inventory	Overall scale	18-54	Low
		55-90	High
	Basic computer skills competency	4-12	Low
		13-20	High
	Academic writing skills competency	4-12	Low
		13-20	High
	Data management and analysis skills competency	5-15	Low
		16-25	High
	Communication skills competency	5-15	Low
		16-25	High

2.2. Study Population, Sampling Strategies, and Sample Size

The study population for the quantitative survey comprised Master of Education students who enlisted in 2011 ($N = 110$) and 2012 ($N = 102$). Three private and three public universities in Uganda whose Master of Education programmes were accredited in 2010 (Lejeune, 2010) were considered for sample selection. The public universities that satisfied this criterion included Gulu University (GU), Makerere University (MAK), and Mbarara University of Science and Technology (MUST). The private universities whose students were surveyed included Islamic University in Uganda (IUIU), Kampala International University (KIU), and Uganda Christian University (UCU). The systematic sampling was based on regional balance, the foundation body, and accessibility. This ensured equitable and yet randomised representation across the institutional divide for quantitative data collection.

Sampling frames for the 2011/2012 and 2012/2013 Master of Education students were then obtained from the selected universities. All the students on the frame constituted the target population. Initially the researchers intended to involve all the students on the frames as participants in the study. However, some of the students could not be accessed while others declined to participate. Therefore, inclusion of a student in the quantitative study depended on the student's geographical location in which the questionnaire could be given and picked, or online, and on the student's consent to participate in the study. Sampling using these inclusion and exclusion criteria resulted in 102 participants as shown in Table 1.

Table 1. Sample size per university.

University	Status	Location	Population				Sample Size
			2011/2012		2012/2013		
			Target	Sample	Target	Sample	
GU	Public	North	21	4	18	10	14
IUIU	Private	East	29	13	16	8	21
KIU	Private	West	11	5	7	4	9
MAK	Public	Central	34	15	35	14	29
MUST	Public	West	7	4	15	13	17
UCU	Private	Central	8	5	11	7	12
Total	N/A	N/A	110	46	102	56	102

Note. GU = Gulu University, IUIU = Islamic University in Uganda, KIU = Kampala International university, MAK = Makerere University, MUST = Mbarara University of Science and Technology, UCU = Uganda Christian University, N/A = not applicable.

2.3. Study Procedure

The study underwent the requisite procedures for an ethical study. The protocol was submitted to Mbarara University of Science and Technology Research Ethics Committee (MUREC) for ethical review. After the ethical clearance by the committee, permission to conduct the research was granted by the Uganda National council for Science and Technology. Permission to obtain the sampling frames from units and departments was got from the office of the academic registrar of the respective university. In most of the universities, the records were accessible from the offices of schools or directorates of postgraduate studies, faculties, and even departments hosting the Master of Education programmes.

Contact information including names, phone numbers, e-mail addresses, and areas of residences of the 2011/2012 and 2012/2013 cohorts of Master of Education students were then obtained from the units. All the students were contacted by phone call and by e-mail to solicit their willingness to participate. Those who consented to participate were then offered the options of administering the instrument; whether online, by mail, or by face to face contact. Then the consent forms and questionnaires were distributed both online and in sealed envelopes to the selected respondents. The online responses were carefully hand copied onto unfilled questionnaires while the hardcopy responses were collected or delivered by post from the students on agreed-upon dates at designated locations.

The collected questionnaires were screened, coded, and the data entered in Statistical Package for Social Scientists (SPSS) Version 20. The entered data were subjected to the necessary transformations such as computations and analysed to test the hypothesis. To determine the mediation effect of research skills proficiency on the relationship between core self-evaluations and research engagement, the hypothesis was tested. This involved running multiple linear regression analysis (Model 4) in SPSS using the Process plugin by Hayes (2013). The statistics generated were interpreted to achieve the objective.

3. Results

Multiple regression revealed that the direct path c of regressing research engagement on core self-evaluations was significant, $b = .67$, t (102) = 2.50, $p = .014$, with a significant overall model, F (1, 100) = 6.22, $p = .014$, $R^2 = .06$. Path a showed that core self-evaluations significantly predicted research skills proficiency, $b = .85$, t (102) = 4.40, $p < .001$, with a significant overall model for the path, F (1, 100) = 19.33, $p < .001$, $R^2 = .162$.

Path b of regressing research engagement on research skills proficiency was also significant, $b = .81$, t (102) = 7.05, $p < .001$. In the indirect path c', the regression of research engagement on core self-evaluations while controlling for research skills proficiency was not significant, $b = -.01$, t (102) = -.05, $p = .96$ with a significant overall model, F (2, 99) = 29.47, $p = .014$, $R^2 = .06$. The Sobel test (normal theory test) results showed that c-c' was significantly different from zero, z = 3.70, $p < .001$, $k^2 = .25$. This suggests total mediation effect of research skills proficiency on the relationship between core self-evaluations and research engagement. Thus the hypothesis (H) was accepted. Figure 1 shows a diagrammatic representation of the mediation.

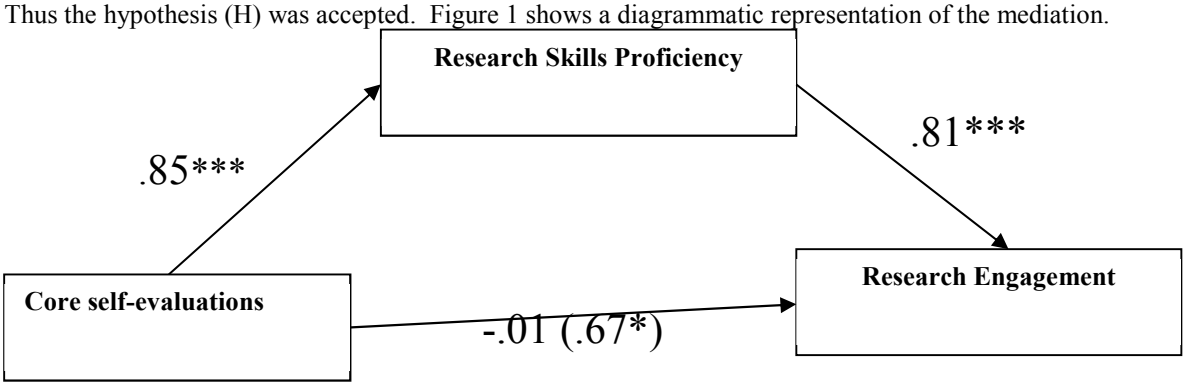

Figure 1. Indirect path of core self-evaluations on research engagement through the effect of research skills proficiency.

Note. * = $p < .05$, *** = $p < .001$.

The mediated relationship in Figure 1 indicates that high core self-evaluations enhance the student's acquisition of high research skills proficiency which enables the student to efficiently engage in research. On the other hand, low rating of the 'self' inhibits acquisition of the core research skills, and consequently undermines the research engagement of the student.

4. Discussion

There was total mediation effect of research skills proficiency on the relationship between core self-evaluations and research engagement (Figure 1). This means, as proposed by Swann (2011) in his self-verification theory, that students with positive core self-evaluations were more likely to seek out environments and interactions that

would enable them to maintain their self-views, even when those views were negative. This implies that positive core self-evaluations students would undertake skills search during the conduct of their research in order to back up their verifications on the job. Consistent with Judge and Kamayer-Mueller's (2011) argument, students with higher self-regard may attain success based on their own desire to demonstrate their positive characteristics to themselves and others.

The findings further imply that individuals with positive core self-evaluations will indeed be better suited to the contemporary academic and career landscapes than those who have less positive core self-evaluations. Such individuals with more positive core self-evaluations will perform their academic and job demands more effectively and will be more goal directed. On the basis of this, we proffer the policy of recruiting Master of Education students on the basis of their core self-evaluations levels; individuals with positive core self-evaluations should be accorded priority entry into the programme. Those with less positive core self-evaluations should be slated for honours programmes for skills and personality training before matriculating into the Master's class. Similarly, employees should be identified and selected for jobs on the basis of the levels of their core self-evaluations and the 21st century skills; those with positive core self-evaluations should be considered in preference to those with less positive core self-evaluations. In addition, employees with less positive core self-evaluations should be identified for continuous professional development training in personality formation.

5. Conclusion

There was a total mediation effect of research skills proficiency on the relationship between core self-evaluations and research engagement. In other words, core self-evaluations significantly influenced the degree to which the students acquired research skills, which later influenced the extent to which the students engaged in research activities. Positive core self-evaluations engendered the students to gain high proficiency in the twenty-first century skills required for Master of Education research.

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