Aksum University (AKU) Faculties' needs for Support in Training and Academic Research: a Basis for Improvement in Productivity of Publication

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Abstract

The objective of this study is to identify and describe Aksum University (AKU) faculties' training and support needs for academic research as a basis of improvement in the productivity of academic research publications. The stratified random sample was 51 faculties from five of the six colleges in Aksum University representing 16.3% of the on-campus teaching faculties. The hypotheses of the study were: (a) training in data analysis and research writing is needed; (b) faculties know how to do research design and methodology; (c) faculties need internet access; (d) research training does not impact teaching; and (e) there are no qualified faculties at AKU for research training. Two Principle Component Analysis factors related to these hypotheses were described as a training factor TFAC1(I need training in data analysis and research report writing) and a support factor TFAC2 (Internet access is essential and research class would not interfere with teaching).

Keywords: Training, Support, Research, Publications, University

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Acronyms

AKU:	Aksum University
CDMA	Code Division Multiple Access
FDRE,	Federal Democratic Republic of Ethiopia
MDGs	Millennium Development Goals
MoE	Ministry of Education of Ethiopia
RTE	Research Training Environments
TFA	Training Factor Analysis
UNDP	United Nations Development Program

Introduction

The strategic plans for the seventeen new universities in Ethiopia and other public universities in such countries as China (Ng & Li, 2000), the United Kingdom (Tapper, & Salter, 2004), and the U.S. (Tierney, 1999) have driven university administrators (Clarke, 2004) to achieve their objectives for recognition and their national funding niche through emphasis on academic research productivity. Since world-wide academic ranking methodologies invariably place a significant emphasis on faculty research productivity, university leaders and mobile faculty members are constantly seeking to enhance their personal and institutional research profiles (Tien & Blackburn, 1996). Over the last decade, Ethiopian university policies have been put in place to establish better university-government linkages to facilitate economic research to support national policy decisions. Universities are strongly encouraged to conduct research to enhance skills on economic and environmental leadership in the context of Ethiopia's emerging economy globally.

The factors influencing faculties' research productivity have been studied for decades (Lotka, 1926). There are a number of factors such as scholarship (Arora & Gambardella, 1996), age and life cycle (Diamond, 1984), research activity performance of department (Hogan, 1981), scientific collaboration (Modrego, 1998), quality of training or individual abilities and skills (Anderson, 1989; Buchmueller, 1999) and faculty motivation and incentives (Monroe & Kumar, 2011b). These studies have all shown a significant relation to academic research productivity.

Additional research (Szymanski, et al., 2007) has demonstrated that research training environments (RTE) are associated with increased scholarly productivity, especially for early career professionals. The researcher-practitioner RTE model and the internship RTE model were found to be the most effective in fostering research interests and productivity in universities.

Dora Marinova (2008) documented that government changes in the research funding methods for universities in Australia that used quantitative indicators such as citations dramatically increased research productivity. One of the unexpected consequences of the changes in university funding methods was the trend to centralize research activities on the campuses to optimize overall university

research funding and productivity. In summary, the initially productive research universities became increasingly more productive. Hadhjinicola and Soteriou (2005) identified salary raise and promotion as the most important factors in the research productivity. They also found that researchers' affiliation to a research center significantly increased the total number of articles published and the number of articles that appeared in elite journals. A related finding on administrative policy showed that external funding for research activities (i.e. research centers) on real-world problems resulted in higher research productivity. Further, enhanced library facilities (specifically internet search engines) and the presence of doctoral students in a university were both the driving forces behind improved research productivity and quality of research.

Chen, Gupta and Hoshower (2006) utilized expectancy theory to identify key factors that motivated the business faculty to conduct researches. Faculty members who attributed high importance to both intrinsic and extrinsic rewards from research productivity exhibited significantly higher research outputs. Whereas tenured faculty members were motivated by intrinsic rewards, untenured faculty members were motivated by extrinsic rewards. Overall, research productivity was positively correlated with tenure status and the percentage of time allocated to research activities and length of academic employment was negatively correlated with research productivity. But there was no relationship between research productivity and academic discipline and gender. In the process of obtaining and disseminating knowledge, numerous personal characteristics impact faculty research productivity. The strength and confidence of the faculty were confirmed as necessary factors in ensuring high levels of research productivity (Bland et al., 2002). However, a study by Abramo, D'Angelo and D'Costa (2008), on the effects of internal and external collaboration on research productivity, found no clear evidence of a correlation between extracurricular collaboration and overall productivity of academic research institutions.

Training is expected to develop and strengthen the skills and knowledge of the faculty members and to enable them to take up the challenging research activities. Training builds self-confidence in the minds of faculty (Subrahmanian, 2010). Training is the process whereby people learn the necessary skills, knowledge,

attitude and the behavior needed to perform their jobs effectively. No educational organization can ignore the importance of training and development needs of faculties in research productivity (Subrahmanian, 2010). Training on conducting research is a process that takes place during a faculties' entire professional life. Research and publication activities can also be taken training processes by themselves, as well (Carlson, 1995; Martin, 1983; Irvine, 1980).Regardless of that, however, Pagey (1981) found most organizations allocate very little of their budget for training, thinking that the effectiveness of training has a very little value added to the organizational objectives. University faculties are the primary actors in the production and publication of researches results. To do so, they need to equip themselves with the skill and knowledge to ensure high level production of academic research and publications. This study should be of interest to research directors, college deans, and other academic leaders engaged in the formulation of policies and procedures on institutional research training designed to strengthen the scholarly performance and contributions of faculties.

The objective of this study is to identify and measure Aksum University (AKU) faculties' perceived training needs and support for conducting academic research and producing research publications.

On the basis of the literature review and an internal analysis on AKU, the following research hypotheses were developed:

- Training in data analysis and research writing is needed;
- Faculties know how to do the design and the methodology of research;
- Faculties need access to internet facilities;
- Research training time will not impact classroom teaching time and
- There are no qualified faculties at AKU that can provide training on conducting a comprehensive research.

Statement of the Problem

Ethiopia is one of the largest and most rapidly developing nations in Africa and conversely, a country with the lowest per-capita income in Sub-Saharan Africa. One of Ethiopia's primary strategies to mitigate the negative impact of globalization was to rapidly expand access to education. This national initiative on ameliorating the level of education in the country required commitment in the

recruitment and training of teachers to assure the continued efforts in the eradication poverty. In 2009, approximately 23% of the United Nations Development Program (UNDP) annual capital infusion was allocated to accomplishing the Ethiopian Education Millennium Development Goals (MDGs) (UNDP, 2010).

Commencing in 2006, thirteen new Ethiopian Universities were opened. This more than doubled the number of graduates from higher educational institutions in the country in 2009. An additional four higher education campuses opened in fall of 2011, bringing the total number of Ethiopian Universities to 30. The total student enrollment in Ethiopian post-secondary education was planned to expand from 264,000 in 2008-2009 academic year to 467,000 in the 2014-2015 academic year. (FDRE, 2010a).

The following excerpt from the UNDP MDG (2010) report illuminates the global education challenges:

Many MDG Country Reports raised concerns about teacher quality. For example, as primary education becomes mandatory, the demand for teachers rises, leaving governments with the unpleasant choice between increasing student-teacher ratios or hiring less-qualified teachers, at least until a larger supply of certified educators graduates. The Ethiopia country report observes: "A second challenge [following regional disparities] relates to the trade-offs between the substantial success in raising the level of enrolment and the quality of education," (pg. 23).

In 2005, the Federal Democratic Republic of Ethiopia's Ministry of Education (MoE) (FDRE MoE, 2005) established a National Higher Education Program Action Plan III of conducting and publishing faculty academic research activities for all higher educational institutions in the country. Under this program, each institution was required to implement an operational strategic plan for faculty research publications in support of the National initiative. Since the year 2006, faculties at AKU and other new Ethiopian universities were under considerable pressure to engage in research activities and produce research publications, with only limited results, though. Consequently, frustration and anxiety surrounding the subject of research publications remained high for both the faculties and the administrators.

According to the results of a 10-year goggle search by a scholar, more than 80% of the academic publications in Ethiopia were from the four well- established universities. Further, thirty five of the thirty nine Ethiopian academic journals were published in Addis Ababa (Library of Congress Overseas Office, 2010).

The research questions considered in this study are:

1. At what level are the faculties' perceived research training and support needs being met at AKU?
2. What actions should be taken to mitigate the faculties' perceived deficiencies in research training as a basis for improvement of research productivity?
3. What actions should be taken to mitigate the faculties' perceived research support needs as a basis for improvement of research productivity?
4. What organizational changes should be implemented to facilitate faculty research activities?
5. What changes should be made on the process and /r policy of employment so as to improve the faculties' commitment to meeting the retirements of Ethiopian higher education?
6. What changes should be made on the process and/or policy of employment to improve the faculties' commitment to research productivity in Ethiopian higher education?

Methodology

Research Design

A non-experimental cross-sectional design by an academic discipline within the target population was used with five non-equivalent groups with multiple replications to reduce non-random self-selection bias. This design used a hypothesized expectation based on the pretest instrument and random interviews of pretest respondents. The design was situational and implementable. Problems in measurement and database construction were adjusted to improve the quality of the responses, to eliminate irrelevant variables, and to improve the construct and internal validity of the data. Efforts were made to obtain appropriate cross-sections of the population groups through repeated individual solicitations of responses.

Study Population

This study was conducted with the target population of the 2011-2012 on-campus teaching faculties at AKU. The 313 faculty study population was selected on the basis of the proximity and accessibility of the campus to the researchers and the newness of the educational institution and its faculties. Open-ended comments from respondents reflected their appreciation of the research study in anticipation of changes that may occur to facilitate the implementation of the strategic research and publication objectives at AKU.

Sampling Method and Sample Statistics

Approximately 10 to 25 questionnaires were randomly distributed to faculties in each of the five colleges on the main campus, depending on the size of the staff. The College of Agriculture located in the city of Shire, 65 kilometers from the main campus, was excluded from the sampling. The process of collecting the completed questionnaires was tedious and tiresome. However, through repeated personal requests, a sample size of 51 questionnaires was obtained. The final sample represented 16.3% of the target population which is statistically adequate to assure the internal validity of the findings. The number of responses from each of the colleges and the total number of faculties in each college is shown in Table 1.

Table 1. Data Collection by College

College	No. of Responses	Responses in%	No. im pop.	% of Respondents from Total Population
Business & Economics	15	29.4	66	22.7
Engineering & Technology	6	11.8	70	8.6
Natural & Comp. Science	10	19.6	85	11.8
Social Science & Language	15	29.4	81	18.5
Health Sciences	5	9.8	11	4.5
Agriculture	0	0	0	0.0
TOTALS	**51**	**100 %**	**313**	**16.3 %**

The demographics of the respondents are shown in Table 2. It should be noted that the respondents' median age is twenty six and their median years in education is two. Almost half of the respondents (47.1%) were Bachelor Degree holders, thirty one percent had Master of Arts (MA) Degrees and 9.8 percent had Doctorate Degrees.

Table 2. Demographics of Respondents

Variable	N	Statistics		
Age	51	Mean = (27.0) 72.5%	Median = (26) 58.8%	21 to 29 = (42) 82.4%
Gender	51	Male = (44) 86.3 %	Female = (4) 7.8%	missing = (3) 5.9%
Birth Nation	51	Ethiopia = (47) 92.2%	India = (4) 7.8%	
Yrs. AKU	51	Mean = 2.12	Median = 2	1 & 2 yrs. = (42) 82.4%
Yrs. In Educ.	51	Mean = 3.75	Median = 2	1 to 4 yrs. = (42) 82.4%
Credits	51	Mean/Median = 10	0 to 9 credits = 41.2%	0 to 12 credits = 88.2%
Highest Deg.	51	Bachelors = (24) 47.1%	Masters = (16) 31.4%	Doctorate = (5) 9.8%

Sampling Instrument

A pilot instrument was developed based on interviews and administrative presentations on the academic research strategic objective of the AKU. The pilot instrument was completed by fifteen College of Business and Economics full-time faculties. Analysis of the responses revealed numerous language problems on English survey questions by an Amharic and Tigray native language respondent community. Elimination of confusing questions and rephrasing and rewording of other questions was completed with the assistance of native language speakers. The statements were randomly alternated between positive and negative to reduce the possibility of respondent responses on only one of the five Likert item scales. Demographic data was collected for each respondent relative to significant pretest determined independent variables. The quality of the data was validated by checking the logical consistency of the responses to the positive and negative statements. Individual responses were logically linked to the research question

under investigation. It was determined that the respondents were highly motivated and provided thoughtful responses. One respondent's questionnaire was eliminated from the sample due to consistent selection of a single Likert scale value. The data collection instrument is shown in Figure 1.

Statistical Procedures for Data Analysis

The researchers used non-parametric statistical methods to determine the initial results of the research study (Corder & Foreman, 2009). Statistical analysis was accomplished using the SPSS statistical package as the primary driver. Spearman correlations were used to investigate the relationships of the ten research training and support variables. The Wilcoxon Signed Rank test for a single sample was used to determine the significant difference of each research statement median from the Likert five point scale median = 3. In the data analysis phase, the 'negatively' worded question responses were re-coded as a

positive response.

Please ☑ check the appropriate response (1 to 5 or NA) for each question!

No.	**Training and Support Questions**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Not Applicable**
T1	An academic research training class would be helpful to me.	□1	□2	□3	□4	□5	□NA
T2	Internet access is essential for doing academic research	□1	□2	□3	□4	□5	□NA
T3	AKU provides sufficient training on academic research methodology.	□1	□2	□3	□4	□5	□NA
T4+	Academic research class will not disrupt my teaching schedule	□1	□2	□3	□4	□5	□NA
T5+	I need training in academic research design.	□1	□2	□3	□4	□5	□NA
T6+	Writing a research paper in the English language is not difficult.	□1	□2	□3	□4	□5	□NA
T7	I need training in data analysis methods in academic research.	□1	□2	□3	□4	□5	□NA
T8	I need training on how to write an academic research paper.	□1	□2	□3	□4	□5	□NA
T9+	I know how to get started on an academic research project.	□1	□2	□3	□4	□5	□NA
T10	There are no qualified faculties to teach academic research methods.	□1	□2	□3	□4	□5	□NA

(+) Original questions restated here as positive

Figure 1. Training and Support for Academic Research

Analysis of the construct validity of the Likert scale responses used Spearman correlations for each of the variables with the observation total scores (Packer, 2004). Variables that had a correlation coefficient less than .4 were eliminated from the Principle Component Analysis (PCA) analysis. Variables T3, T5+ and T9+ were also eliminated as they were found to be in significant (p > .05) and correlation coefficients less than .4 with total score. Table 3 shows the distribution of responses.

Table 3. Variable Descriptive Statistics

Variable	Mean[a]	Med[b]	Sig.[b]	Variance	#SD[c]	#D[c]	#N[c]	#A[c]	#SA[c]	N

T1	4.52	5	.001	.294			1	22	28	51
T2	4.88	5	.001	.106				6	45	51
T3	2.06	2	.001	1.06	17	20	10	2	2	51
T4+	3.88	4	.001	.906		6	8	23	14	51
T5+	3.78	4	.001	1.17	3	5	3	29	11	51
T6+	4.16	4	.001	.815	1	3	2	26	19	51
T7	4.12	4	.001	.856	2	2	1	29	17	51
T8	3.82	4	.001	1.47	5	3	3	25	15	51
T9+	3.63	4	.002	1.40	5	4	6	26	10	51
T10	3.22	3	.178	1.33	3	13	12	16	7	51
(+) Recoded as positive										

The internal validity of the seven remaining training and support variables was verified using Cronback's Alpha (Cronbach, 1951) and resulted in an acceptable alpha of .75. Principle Component Analysis (PCA) with Varimax rotation was used to consolidate the remaining seven variables. Although PCA is a parametric procedure, numerous research papers over many years confirmed that PCA is a very robust analysis and violation of the underlying normality assumption did not provide incorrect answers (Norman, 2010; Carifio & Perla, 2008; Darlington, 1966; Pearson, 1931). The seven training and support variables were found not to be normally distributed using the statistical goodness-of-fit tests Anderson-Darling and Kolmogorov-Smirnov.

Results

Descriptive Statistics and Significance Tests

Table 3 also shows the summary descriptive statistics for the original ten variables measuring faculties' training and support needs for academic research. The One Sample Wilcoxon Signs Rank Test (Null: Median/Mean = 3) hypotheses test for each variable is noted. The responses for all negatively worded questions for variables T4+, T5+, T6+, T9+ were recoded to a positive response on the five-point Likert scale (Brendl & Higgins, 1996). The variable T3 (AKU provides sufficient training in research methodology), was scored as Disagreed or Strongly Disagreed by the respondents with a significant ($p < .05$) median = 2 and mean = 2.06. Although the variable was eliminated from the PCA analysis by total score correlation and significance, it provided a clear indication that this is an area that needs improvement for research training at AKU.

The variable T5+ (I understand research design steps), was scored as Agreed by respondents with a significant median = 4 and mean = 3.78. Although the variable was eliminated from the PCA analyses by total score correlation and significance, it provided an indication that research design was not an issue in the discussion on needs for training. The variable T9+(I know how to get started on an academic research project), was scored as Agreed by respondents with a significant median = 4 and mean = 3.63. Although the variable was eliminated from the PCA analyses by total score correlation and significance, it provided an indication that starting a research project was not a training issue.

T1 - T10 and Demographic variables Spearman ρ Correlations

The significant ($p < .05$) Spearman ρ correlation matrix for T1 - T10 variables related to the respondent demographic variables is shown in Table 4. The five training and support variable's (T5+, T6+, T8, T9+ and T10) correlations with the demographic variables (Male and Highest Degree) were not readily explainable.

Table 4 Spearman ρ Correlations T1 - T10 with Demographic Variables

Variable	Demographic Variable	Corr. Coef. ρ	Significance
T6+	Male	-.384	.005
T9+	Male	-.305	.030
T5+	Highest Degree	.304	.038
T8	Highest Degree	-.306	.029
T9+	Highest Degree	.406	.003
T10	Highest Degree	-.276	.050
(a) Missing values were replaced with the mean of the variable. (b) One sample Wilcoxon Signs Rank Test (Null: Median > 3 or <3; one tail test) (c) SD=Strongly Disagree; D=Disagree; N=Neutral; A=Agree; SA=Strongly Agree			

The significant ($p < .05$) Spearman correlation matrix for demographic variables is shown in Table 5. The logical relationships between the variables were obvious. The number of credit hours taught decreases with a higher educational degree because Master's level faculties are utilized in academic leadership positions which reduce their teaching responsibilities.

Table 5 Spearman ρ Correlations between Demographic variables

Demo. Variable	Demo. Variable	Corr. Coef. rho	Significance
Age	Years in Educ.	.384	.005
Age	Highest Degree	.527	.001
Years in Education.	Highest Degree	.456	.001
Years. At AKU	Years in Educ.	.574	.001
Credits	Highest Degree	-.459	.001

Principle Components Factor Analysis

PCA with Varimax rotation was used to reduce the seven variables relating to training and support needs for academic research (Darlington, 1966; Norusis, 2004). The use of PCA with Likert Scale data limitations was considered (Allen & Seaman, 2007; Clason & Dormody, 1993; Colman, Norris & Preston, 1997; Dawes, 2008; Lubke & Muthen, 2009; McCall, 2001). Based on evidence from the data analysis, the researchers judged the application to be appropriate. The two factors constructed by PCA explained 51% of the variance by sums of squared loadings. The results of the complete PCA are shown in Tables 6, 7, and 8, and Figure 2 and Figure 3.

Table 6. Factor Components and Variance Explained

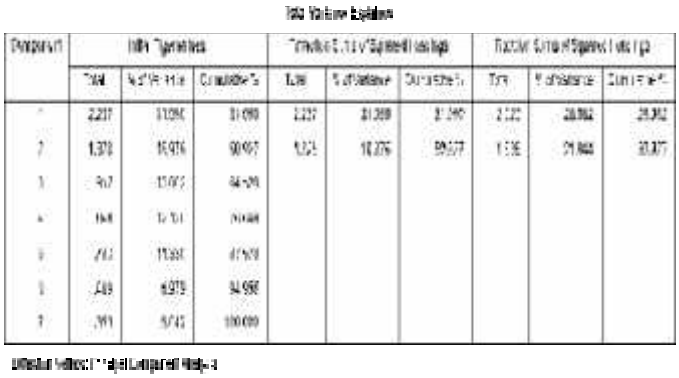

Figure 2 is Cattell's scree plot (Cattell, 1966) of the components shown as the X axis and the corresponding eigenvalues as the Y axis. Where the decrease in eigenvalues flattens and the curve makes an elbow, Cattell's scree test says not to consider further components after the one starting the elbow. An eigenvalue of 1.0 was used for the selection of two components.

Figure 2. Cattell's Scree Plot

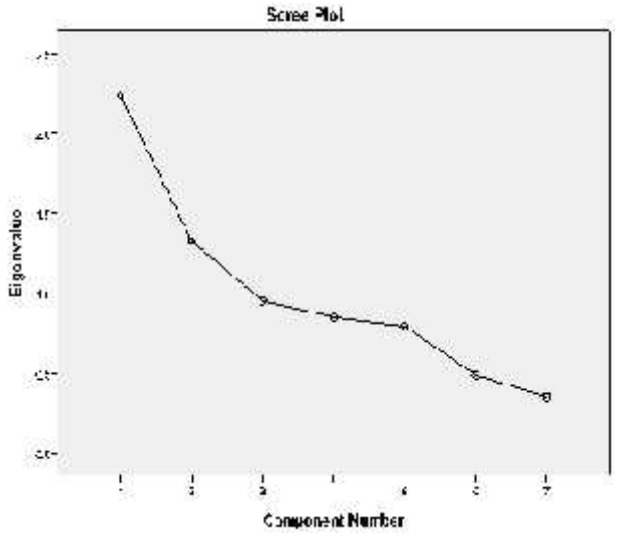

Figure 3, Component Plot in Rotated Space, shows each of the seven variables included in the two factors selected in this analysis. Significant correlation between the seven variables in the PCA procedure made identification of an appropriate models challenging. The two factors selected were on the basis of a training factor TFAC1 and a support factor TFAC2 with two shared variables T1and T10. The training factor TFAC1 variables T7, T8,

T1, and T10 are well clustered. The support factor TFAC2 variables T2, T4+, T6+, T1, T10 are also well clustered.

Figure 3. Component Plot in Rotated Space

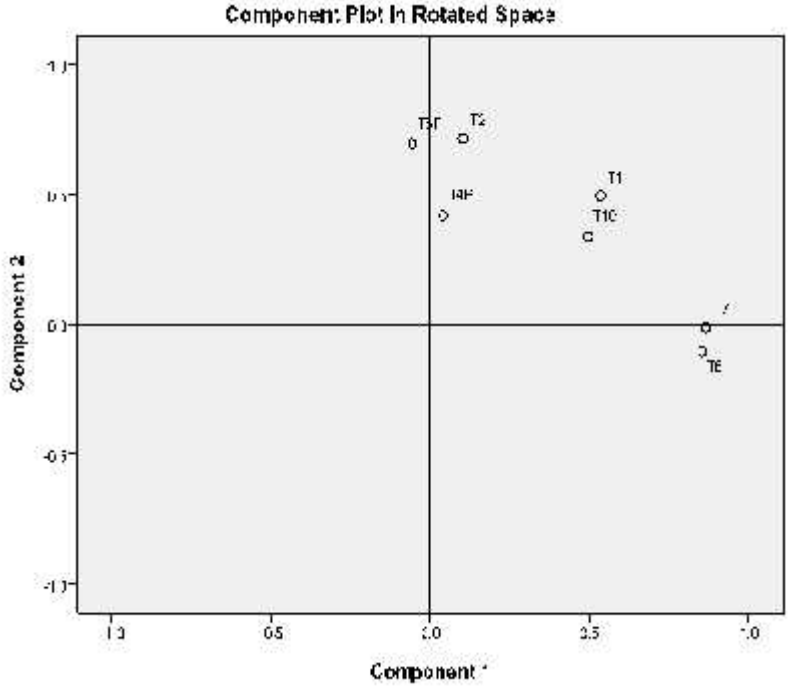

Table 7 shows the Variable Loadings (correlations) for each factor after rotation. An arbitrary rule-of-thumb for level of correlation significance for primary variable loadings in a factor should be .7 or higher to confirm that about half of the variance in the variable (r^2 = .49) is being explained by the factor. This rule was violated by variable T4+ in factor TFAC2.

Table 7. Factor Variable Loadings

Rotated Component Matrix[a]		
	Component	
	1	2
T1	.534	.494
T2	.103	.716
T4P	.041	.418
T6P	-.056	.693
T7	.867	-.013
T8	.855	-.105
T10	.495	.337

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Factor Models, Correlations and Test of Significance

Table 8 shows the standardized component factor scores which are used as coefficients for the variables in resulting factor models. The factor definitions TFAC1 and TFAC2 demonstrate the factor mathematical models, their means, medians and the test of significance against an implied neutral Likert scale median = 3. It should be noted here that, variables T1 (A research training class would be helpful) and T10 (There is no qualified faculty that can teach research methods), are present in both factors. Their factor model coefficients were smaller than desirable but closely related in magnitude for both factors indicating they are shared variables across both factors.

Table 8. Standardized Variable Scores by Factor

Standardized Component Score Coefficient Matrix			
	Component		
	Question	1	2
T7	I need training in the data analysis methods in academic research.	.450	-.120
T8	I need training on how to write an academic research paper.	.456	-.181
T1	An academic research training class would be helpful to me.	.213	.268
T10	There are no qualified faculties to teach academic research methods.	.213	.166
T2	Internet access is essential for doing academic research	-.039	.475
T4+	Attending an academic research class would enhance my teaching.	-.033	.280
T6+	Writing a research paper in English not difficult.	-.118	.481
T1	An academic research training class would be helpful to me.	.213	.268
T10	There are no qualified faculties to teach academic research methods.	.213	.166
(+) Recoded question to be positive Extraction Method: Principal Component Analysis. Rotation Method: Equamax with Kaiser Normalization.			

TFAC1 Training Factor 1 (Variables T7, T8, T1, T10)

Training Factor Description: I need training in data analysis and research report writing.

Research training would be helpful; however, the availability of a qualified faculty to train on research is a question.

Observation Values = .213*T1-.039*T2-.033*T4P-.118*T6P +.450*T7+.456*T8 +.213*T10

Factor mean = 4.43

Factor median = 4.5

Factor Median Test Value =.213*3 -.039*3 -.033*3 -.118*3 +.450*3+.456*3 +.213*3 = 3.43

Median test conclusion: 4.5 > 3.43 (Strongly Agree)

TFAC2 Support Factor 2 (Variables T2, T4+, T6+, T1, T10)
Support Factor Description: Access to Internet is essential and a research class would not interfere with teaching. Research training would be helpful; however qualified faculty is a question.
Observation Value = .268*T1 +.475*T2 +.280*T4P +.481*T6P -.120*T7 -.180*T8 +.166*T10
Factor mean = 5.98
Factor median = 6.19
Factor Median Test Value = .268*3 +.475*3 +.280*3 +.481*3 -.120*3 -.180*3 +.166*3 = 4.11
Median test conclusion: 6.19 > 4.11 (Strongly Agree)

In Table 9, the factor medians were tested against the factor test median calculated by assigning a median value = 3 for each of the variables included in the factor. The One-Sample Wilcoxon Signs Rank Test (Null: Median >3; one tail test) nonparametric statistical method was used. The two factor median calculations were significantly (p<.001) highly than the test median values.

Table 9. Summary of Factor Tests of Significance

Factor	Mean	Median	Test Md.[b]	Sig.[a]	N	Indication
TFAC1	4.43	4.50	3.43	.001	51	S. Agree
TFAC2	5.98	6.19	4.11	.001	51	S. Agree
(a) One-Sample Wilcoxon Signs Rank Test (Null: Median >test median (b) Factor Test Median (all variables = 3)						

Training and Support Factors Related To Demographic Variables

Table 10 shows the spearman ρ correlation analysis for TFAC1 and TFAC2 and the demographic variables. Only three significant (p<.10) relationships were found. TFAC1, I need training in data analysis and research report writing, was significantly related to total credit hours taught ρ = .281 (p =.097) and highest degree ρ = -.348 (p = .012). The TFAC1 finding was consistent with previous demographic variable relationships of total credit hours taught being highly negatively correlated with highest degree. TFAC2 (Access to Internet is essential) and (Research class would not interfere with teaching) was significantly related to male ρ = -.248 (p = .080). The TFAC2 correlation with male is not readily explainable.

Table10. Correlations of Training and Support Factors and Demographic Variables

Training Factors & Demographic Correlations			
Training Factors	Demographic Variables	Corr.[a]	Sig. *P* =
TFAC1	Credits	.281	.097
TFAC1	Highest Degree	-.348	.012
TFAC2	Male	-.248	.080
(a)Spearman ρ			

Respondent Comments

The comments of twenty respondents to the open ended question at the end of the survey instrument are summarized for training and research support in Table 11.

A recurring theme that came out was the need for training on research methodology research writing..Even though the respondents in aggregate were overwhelmingly positive about research, there was some discouragement expressed over some colleagues' reluctance to participate in research activities thinking it was a waste of time, according to the responses. This implied that there was resistance to academic research activities at a subliminal level in the AKU. It can therefore be argued that intellectual curiosity was not a universal behavior of AKU faculties.

Table 11. Respondent Comments on Training Needs

R&D group should organize workshop and training for AKU staff on how to conduct, analyze, and write research reports.
Faculty needs training on how to find the research problem or area/field of research.
Faculties seek recognition in the University and need some training on Research Methods.

Training on Research Methods is needed
Training on Research Methods and Less Responsibility is
Collaboration with national & international institution is necessary for training.
Good if university provides an opportunity for training on academic research
Wants to become a researcher and he wants training.

Training and Support Factor Correlations with Attitude and Incentive Factors

A parallel study on the same population at AKU identified and described the faculties' attitudes towards research as a basis for improvement in productivity of academic research publications (Monroe & Kumar, 2011a). The hypothesis for this aspect of the study was that, the attitude of faculties in the new universities towards academic research publications was negative.

But the empirical analysis found a highly positive attitude on all aspects of academic research process in the AKU. The three principle component factors are described as: AFAC: academic research is positive for me; AFAC2: reading research is enjoyable and research helps build the institution's reputation; and AFAC3: a research team experience is positive and will make me work harder.

Yet another parallel study on the same population at AKU identified and described the importance of incentives and motivations by the faculties for academic research activities as a basis for possible improvements in productivity of academic research publications (Monroe & Kumar, 2011b). Again, the hypothesis for this study was that the faculties in new universities regard the role of incentives and motivations for academic research publications as negative.

The empirical analysis however found that the respondents perceived numerous personal incentives and motivations for academic research activities but generally, there was none at AKU. The three principle component factors were described as: ***IFAC1***: AKU career, teaching skills, research presentations and job descriptions are positive motivators; ***IFAC2:*** using academic time and financial rewards are not incentives; and ***IFAC3***: collaboration with peers is a positive incentive and a motivator for engaging in research endeavors.

Table 12 shows the correlations between training and support factors and between research attitude and incentive factors identified earlier in this study of the same population. The support factor TFAC2, Internet access is essential and research class would not interfere with teaching, and the incentive factor IFAC1, AKU career, teaching skills, research presentations and job descriptions are positive motivators, were significantly correlated at $\rho = .331$ ($p = .018$).

The support factor TFAC2 also correlated with the attitude factors AFAC1, academic research is positive for me, at $\rho = .234$ ($p = .098$) and AFAC2, reading research is enjoyable and research helps build the institutions' reputation, at $\rho = .251$ ($p = .075$). The consistency of these correlations supported the internal validity of the data.

Table 12. Correlations, Training, Attitudes and Incentives Factors

Training, Incentives and Attitudes Factor Correlations			
Training Factors	Attitude & Incentive Factors	Corr.[a]	Sig. *p*=
TFAC2	IFAC1	.331	.018
TFAC2	AFAC1	.234	.098
TFAC2	AFAC2	.251	.075
(a) Spearman ρ			

Discussion

Faculty Training and Support for Academic Research

The objective of this study was to understand how to facilitate faculty research productivity through training and support activities

in a newly established university. The instrument used in this study was constructed through an iterative process that included expresses opinions of the faculties from: (a) a university-wide research training lecture, (b) a research training session by the university's College of Business, (c) faculty informal personal interviews and (d) the researchers' experiences on the university campus in efforts to facilitate faculty research teams. The culmination of these activities resulted in the pilot survey instrument and the finalized survey instrument. This research study significantly confirmed these hypotheses at the variable and factor levels. These findings are summarized as; (a) there is no sufficient research methodology training at AKU; (b) research design and starting a research project are not training issues; (c) training is needed in data analysis and research paper writing; and (d) internet access is essential and a research class would not interfere with teaching.

Consolidation of the seven study training and support variables using PCA indicated that two factors significantly confirmed the study hypotheses. The training factor TFAC1, I need training in data analysis and research report writing, indicated that the faculties are not confident in these two areas of research methodology. The support factor TFAC2. Internet access is essential and research class would not interfere with teaching, indicates a need for improvement in internet access and teaching load is not an issue in the subject of research. The variables T1 and T10 were common to both of these factors indicating, generally, that the faculties' perceived need for research training and qualified faculty for teaching research is questionable.

Of the 21 open-ended comments of the written questionnaire, eight specifically mentioned a need for training and support relative to research activities. The faculties' relative inexperience (majority are bachelors level qualified) and related inexperience in academia (median = 2 years) exacerbates their need for training and for support in research activities. Nowick(2008) identified a potentially confounding factor for this study relating to academic research publication productivity. Results from this study are consistent with Lotka's law (1926), which states that a relatively few scholars contribute disproportionately to the body of scientific literature. Full professors make up 25% of the total U.S. faculty (Almanac, 2007). In this study, full professors were found to author 46% of open access journal articles and 63% of for-free journal articles.

Other bibliometric studies for Africa confirmed that this relationship of rank to academic research publications is present in Ethiopia (Schamp & Schmid; & Mugabushaka, 2008). However, these studies did not include the influence and important impact of the faculties' perceived needs for training and support on the productivity of academic researches.

Additional research about this confounding factor is beyond the scope of this study. But it is a fertile field for further exploration in the context of capacity building efforts on research publication in new academic institutions with scarce resources and a limited pool of qualified faculties. The empirical indications of the faculties' perceived needs for training and support in academic research activities provide significant direction for university administrations to emphasize on the importance of research activities and encourage the faculties' endeavors in this regard. Faculties' inactivity in academic research projects can be attributed to a lack of training in academic research methodologies. Additional research is needed to replicate the same study at other new higher educational institutions in Ethiopia and other rapidly expanding higher education systems worldwide. Confirmation of the research training and support needs in rapidly expanding higher education systems in transitioning nations is needed to provide administrative direction for research. Additional data are necessary to confirm the extrapolation of these results to other higher education systems worldwide.

Recommendations

The economic and human resource challenges of high growth tertiary education in Ethiopia and other developing nations are daunting. At issue here are the shortage of qualified teachers, limited infrastructural facilities, and the limited fiscal budget for sustainable support to the education sector in Ethiopia.

The following recommendations are forwarded to provide immediate solutions to the problems faced by AKU as regards to the needs for training and support in research activities. The recommendations may also be applicable in other newly-established universities in Ethiopia.

1. Recruit and hire more Masters and Doctorate Degree holders as academic staff, not administrators.

2. Make research training by a qualified academic professional a condition of employment at all university faculties.
3. Make research publications part of the annual faculty evaluation process and a requirement for renewal of employment contract.
4. Provide monetary rewards such as accelerated promotion, and a one-time stipend for successful research projects and install department research budget.
5. Provide non-monetary rewards such as campus recognition, funding for Ethiopian conference presentation, reduced teaching load and introduce annual distinguished researcher award for successful research and publication projects.
6. Establish an AKU research center, funded by government and private sector grants, to ensure financial and professional assistance for faculties for conducting and publishing research.
7. Implement a research evaluation regime to measure the effectiveness of research efforts.
8. Provide internet services to all faculties through campus facilities and/or through providing wireless internet devise (CDMA) to academic staff.
9. Facilitate the formation of a new faculty research-team and mentoring with experienced researcher-publisher faculty.
10. Mentor new faculty to encourage commitment to teaching as a first choice career (reduce faculty turnover) and productivity in research as a rewarding activity.

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