# Career empowerment Variables and Academic Staff Research Productivity in a Public University: Does Collaboration and Institutional Culture Mediate the Nexus?

**Eyiene Ameh**
University of Calabar, Calabar, Nigeria https://orcid.org/0000-0002-2438-8594
**Valentine Joseph Owan** ( owanvalentine@gmail.com )
University of Calabar, Calabar, Nigeria https://orcid.org/0000-0001-5715-3428
**Ekpenyonganwan Godwin Anam**
University of Calabar, Calabar, Nigeria

**Research Article**

**Keywords:** Collaboration, institutional culture, institutional support, mediation analysis, mentorship, structural equation modelling

**Posted Date:** October 19th, 2021

**DOI:** https://doi.org/10.21203/rs.3.rs-978602/v1

# Abstract

This study estimated the direct and indirect contributions of two career empowerment variables – mentorship and institutional support to the research productivity of academic staff at a public university in Cross River State. Two mediator variables – collaboration and institutional culture were introduced to determine their roles in the nexus between the predictors and the outcome variables. The quantitative research method, following the correlational research design, was adopted for the study. A census approach was used in enumerating the entire population of 327 academic staff (from Lecturer II to Professors) for the study. “Career Empowerment and Research Productivity Questionnaire (CERPQ)” was used for data collection, after validation by experts and passing the reliability test. A total of 327 copies of the CERPQ were administered but 303 were retrieved. Structural Equation Modelling and mediation-based analysis were performed based on the hypothesised models. Amongst others, it was discovered that mentorship has a non-significant negative contribution to the research productivity of academic staff; mentorship only promotes research productivity among academic staff, if it is followed by a good institutional culture and collaboration habits. Institutional support has a non-significant positive contribution to the research productivity of academic staff. The joint mediation of collaboration and institutional culture was proven to be significant on the nexus between mentorship versus research productivity, and between institutional support versus research productivity of academic staff in the public university. Collaboration is the most important factor that boosts directly the research productivity of academic staff and that can also mediate the contributions of other variables to the research productivity of academic staff. It was recommended, among others, that academic staff in universities should work very hard to build a strong network and linkages with other scholars at the institutional, regional, national and international levels. This will enable them to maximise fully the benefits associated with research collaboration and boost research productivity.


# Introduction

Publication output is very important not only to the academic staff but to academic institutions in general. It is generally known that peer-reviewed publications are the primary unit by which academic faculties and educational programmes are judged. It enables academic staff members to share insight, demonstrate academic scholarship, gain recognition for creative thinking, and finally, develop a reputation for expertise in a speciality area. Publication output partly determines both local and international recognition and respect for academic staff and academic institutions generally. Universities now also use the number of publications to an individual's credit as a measure of competency (Owan & Owan, 2021). Similarly, Bassey, Akuegwu, Udida and Udey (2007) observed that publication output is very significant in the lives of academic staff; hence their promotions are almost entirely dependent on it. This has brought immense pressure on academic staff to publish or perish. The phrase "publish or perish", initially coined by Coolidge in 1932, is now a harsh reality for those who teach at universities (Rawat & Meena, 2014).

Many researchers define research productivity by equating it with the "quantity" of published works academics have accumulated, or what is commonly termed "publication counts" (Akbaritabar et al., 2018; Butler, 2003). A researcher is considered as being productive based on the number of books or articles translated from a foreign to a local/native language, the number of written reports for consultancy work, number of research involvement and research-related presentations, and the number of creative works developed (Bai, 2010; Eam, 2015). Several other studies (e.g., Agarwal et al., 2016; Carpenter et al., 2014) have considered the quality aspect of academics' research productivity by using bibliometric methods (such as citation counts, citation rates, h-index and others) to determine the scholarly impact of a specific article, author, or publication.

Citation index and h-index are the best ways to measure research productivity by precisely capturing the average number of times a scholar's published works and the research works published by a university, country, region or continent are cited by scholars internationally (Kpolovie & Dorgu, 2019; Owan & Owan, 2021). The two indices (h-index and citation index) demonstrate how much each faculty member contributes to the totality of human knowledge and reveals whose research has distinctly stood out by been frequently picked up and built upon by other scholars and used in the industry. Today, the reputation of scholars and their research excellence is determined based on the extent to which their h-index and citation index overwhelmingly exceed those of other scholars of the same discipline. The more the number of scholars with unprecedented h-index and citation index in a university, the more prestigious the institution is publicly perceived in terms of its teaching-learning environment (Kpolovie, 2014), and the higher the research income that the university attracts. Going by these, we can say that the productivity of academic staff is a “game of numbers”.

Some scholars have advocated that for a researcher to be productive, the following factors must be considered such as having a strong research orientation upon starting a career in the university, having the highest terminal degree, early publication habits (Horta et al., 2016; Kpolovie & Onoshagbegbe, 2017; Ndege et al., 2011), previous publication activity, communication with colleagues, subscriptions to many journals, and sufficient time allocation to research (Finkelstein in Oyeyemi et al., 2019). Other factors that can contribute to the productivity of researchers include affiliation to a university or research institution, assigning ample time for faculty to conduct research and the use of an assertive participatory management approach (Bland et al., 2019).

However, preliminary assessments of the research productivity indicators of most academic staff in Nigeria tend to give a weak impression of their reputation. While it is possible to see many scholars elsewhere with an h-index higher than 300, most scholars in Cross River State are still struggling to reach an h-index of 5. Again, many academic staff in the area of study, are yet to win a grant even after attaining professorial status. Most junior and senior academic staff of universities are often seen struggling to publish in highly rated peer-reviewed journals, especially those published by well-respected publishers such as Elsevier, TandFonline, Nature, Springer, Sage and so on. Even though research productivity is one of the requirements for every lecturer in any university, there has been a low turn up of lecturers to participate in writing and publishing research works, especially in Nigerian universities. This is

often observed during appraisal for promotion, where some academics are denied promotion for having not met the minimum publication requirements expected. Again, the extent to which many scholars rely on what may be term as "the put my name syndrome" in climbing their career trajectory seems to be on the high.

Consequently, many early-career academics and junior faculty members tend to be seen without the zeal to engage in active research initiatives due to their perceived heavy reliance on other scholars for subsistence. This tends to affect their research capacity as many of them cannot initiate a research idea, collect and analyse data nor prepare a research report for publication. Furthermore, this also seems to reduce the number of scholars in universities with the capacity to carry out independent research, especially as more seasoned scholars are retiring or dying. There could be several reasons why academics do not write for publication such as the overall non-satisfaction levels of academic staff with the job; socialisation of faculty staff members into a research climate; university mission vis-à-vis academic research; demographic factors such as age, gender, experience, academic rank; time, teaching load, research competency, interest in doing research, and institutional factors such as poor working environment, extra administrative duties, institutional support, institutional culture, inadequate mentoring, among others. It was on this note that the present study was conceived to find out whether some career empowerment variables such as mentorship and institutional support can contribute to the research productivity of academic staff in universities; as well as to determine whether collaboration and institutional culture mediate the nexus in the relationship among mentorship, institutional support and the research productivity of academic staff in public universities.

## Mentorship and academic staff research productivity

Mentoring affords the transfer of skills that protégés can apply in diverse professional circumstances, promotes productive use of knowledge, clarity of goals and roles, career success, career growth, salary increases and promotions, career and job satisfaction (Okurame & Balogun in Undiyaundeye & Basake, 2017). Previous studies on mentorship and research productivity tend to reveal a significant positive correlation between the two variables (Abugre & Kpinpuo, 2017; Arkaifie & Owusu-Acheampong, 2019). This result implies that improvement in the mentorship practices within an institution is connected to increased productivity. However, these studies did not explain the role that other extraneous or confounding variables play in the nexus between mentorship and research productivity. Oftentimes, many variables occur at the same, and if some are considered over others, it could skew the result obtained leading to misleading conclusions. The present study bridged this gap by introducing two suspected confounding variables – institutional culture and collaboration to the nexus between mentorship and research productivity.

Another study by Carmel and Paul (2015) indicated that mentees were positively impacted by opportunities related to career advancement, expanded thinking, scholarly confidence, facilitation of a collaborative culture, and the importance of goal setting in academia. The study, however, did not take

into consideration the role institutional variables play in the mentor-mentee relationship established. This leaves us hanging whether we can count on mentorship at all times as a factor accounting for most of a researcher's productivity. The present study bridged this gap by enlisting other institutional variables such as institutional culture, institutional support and collaboration to determine a series of interconnections amongst them. The research conducted by Arkaifie and Owusu-Acheampong (2019) revealed that mentoring programmes positively affect mentees' work and personal life. The cited study's focus was on mentoring programmes at the institutional level, while the present study sought to determine the contribution of mentorship at the personal level among senior faculty in enriching or otherwise the productivity of mentees (who in most cases are junior academics.

The research of Chitsamatanga et al. (2018) discovered that mentoring is there in universities theoretically, but the practical concept appears to be surrounded by grey areas. The study of the cited scholars revealed a myriad of problems surrounding mentorship such as a general lack of interest, knowledge and ignorance from the academics on mentoring and networking, academics' perceptions of mentoring and networking in universities, as well as a shortage of role models. To the scholars, these problems promoted disintegration, inaccessibility and egoism within universities. Similarly, a study identified a problem associated with mentorship in universities by revealing that it is useful most often to the senior partner in the union, as it provides an opportunity for them to develop a base for technical support and power, which can be readily summoned in the future (Okurame in Undiyaundeye & Basake, 2017). This implies that senior partners are more likely to benefit from a mentor-mentee relationship than the mentee. However, it is yet to be known whether such benefit on the part of the mentor is in the short- or long run. It is also yet to be known the point or situation where the mentee is likely to benefit from the relationship, going by the finding of Okurame. This means that further research is still needed in this area.

## Institutional support and academic staff research productivity

Institutional support, in this context, refers to the active organisational encouragements in the form of policies, regulations, monetary and non-monetary help that propel employees to perform their responsibilities in a very effective and productive manner. Any organisation, including the institutions of higher learning, that want to earn employees' commitment must be ready to give adequate support. For instance, higher education institutions' institutional support includes research support in conference sponsorship, research grants, publication support, technical support, and pedagogical support, particularly in a knowledge-based economy (Al-Enazi, 2016). It has been proven empirically by the research of Salau et al. (2018) that meaningful work and growth opportunities are predictive factors for maximising productivity in the sampled institutions. However, the study was not explicitly focused on the research productivity of workers and the institutions studied were non-academic. A study on the contribution of institutional support and academic staff research productivity is, therefore, necessary to streamline the knowledge in the literature to the academic sphere, since they are among the mainstream producers of knowledge.

The research of Henry et al. (2020) revealed that age cohort, highest qualification, cluster and track emphasis are variables that significantly determine the research productivity of academic staff. The cited study concluded that personal, environmental and behavioural factors influence the research productivity among academic staff. Nevertheless, none of the enlisted variables was considered in relation to other cofounding variables that can mediate or moderate the association. Another study concluded that even though organisational factors are significant antecedents of university academic staff research productivity, some of its elements (such as technological progress and possession of computer skills) were more significant antecedents than others (Hiire et al., 2020). This implies that to boost the research productivity of the academic staff, university managers need to place proportionate emphasis on these factors if they are to create an enabling research environment in their institutions. This seems to explain why some earlier studies revealed that organisational factors and funding could positively influence sustainability and research productivity in universities and colleges (Kyaligonza et al., 2015; Musiige & Maassen, 2015).

This kind of scenario was not very different from what Oyekan (2014) reported in his study that resource situation factors such as physical, human and material resources have significant positive relationships with academic staff's research productivity. Clarifying this, a recent study showed that institutional factors (such as availability of research funding, level of institutional networking, and the degree of research collaborations) and individual factors (such as personal motivation, academic qualifications, and research self-efficacy) are associated with the level of research productivity in Higher Education Institutions in Africa (Uwizeye et al., 2021). Furthermore, research conducted by Falola et al. (2020) shows that research, pedagogical and technical support are predictors of faculty responsiveness to quality research production, quality knowledge sharing and administrative efficiency.

Having explored related literature on institutional support and research productivity, it was discovered that several meaningful connections have been established in the literature. However, none of the previous works has used the mediation or moderation analysis approach to determine the roles cofounding, moderating or extraneous variables play in the relationship between institutional support variables and research productivity. It is important to understand all the variables that contribute to a researcher's productivity and the various roles they play amid other predictors. This study is an attempt to understand under what conditions are certain institutional support variables are likely to contribute (significantly) or otherwise to the research productivity of academic staff.

## Collaboration and academic staff research productivity

The advancement of scientific knowledge demands that the researcher be equipped with the appropriate competencies, beginning from learning about the problem under analysis, which permits the individual to carry out original and relevant studies, up to the necessary competencies in methodologies and reporting the findings in publication. The increasing multi-disciplinarity and complexity that characterises current scientific research results in contexts where a single scientist does not possess all the necessary

competencies to achieve scientific advancement (Abramo, et al., 2017). Collaboration permits overcoming these shortcomings through involving scientists who are specialised in the missing competencies. Moreover, collaboration facilitates the generation and selection of original ideas, due to the synergies obtained from scientists with complementary backgrounds or even from different disciplines (Abramo et al., 2017; Rigby & Edler, 2005). Multiple authors' involvement also permits more efficient use of time. It limits the need to resort to external advisors, for example, for third-party checking of research processes and outcomes (Barnett, Ault & Kaserman cited in Abramo, D'Angelo & Murgia, 2017).

There seems to be a dearth of the empirical literature on collaboration and research productivity. However, one related study, conducted by Alaa, and Ahmad (2020) indicated that fund, collaboration, ICT and job satisfaction had a positive and significant impact on research productivity. It was further revealed that funding has the highest impact on research productivity. The implication of this study is the management of universities should pay greater attention to research funding opportunities, rewarding collaboration among researchers, enabling ICT and improving job satisfaction to boost the research productivity of the academic staff. The present study intends to build on the cited study by extending the role of collaboration as a known predictor to a mediator variable in the nexus among mentorship, institutional support and research productivity, while still serving as a predictor.

### Institutional culture and academic staff research productivity

Several studies have investigated the organisational factors that significantly relate to the research productivity of university academic staff, and they have all emerged with diverse, and at times, contradictory findings (e.g., Kyaligonza, 2015; Mugimu et al., 2013; Musiige & Maassen, 2015; Oyekan, 2014). For instance, Bland et al. (2005) tested the ability of individuals, institutional and leadership variables in influencing faculty research productivity using data from the University of Minnesota Medical School - Twin Cities. Their regression results revealed that faculty productivity was influenced more by institutional rather than personal characteristics. Hadjinicola and Soteriou (2006), on the other hand, investigated factors that promote the research productivity of the researchers in US Business schools. Their findings revealed that three factors increased the research productivity and the quality of the articles published by the professors in the Business schools. These factors were: the presence of a research centre, funding received from external sources for research purposes and better library facilities.

In another study, Hedjazi and Behravan (2011) analysed the relationship between individual, institutional and demographic characteristics on the one hand and the research productivity of agriculture faculty members all over Tehran Province on the other hand. They discovered that institutional characteristics, namely: a network of communication with colleagues, resources of facilities, corporate management and clear research objectives, were significant predictors of the agricultural faculty members' research productivity. Also, the descriptive results of Kyaligonza (2015) reveals that institutional factors had a moderate effect on the research productivity of the academic staff in the universities studied. However,

the cited study was focused on public universities in Uganda while the present study's focus is on a public university in Nigeria.

In another development, Ayesha et al. (2021) found that different components of institutional elements such as research procedure of departments, job and compensation, as well as assets and helping materials have a low, however positive correlation with research profitability of teaching personnel. Furthermore, Jaime (2020) established that for every unit increase in holding high-performance expectations and providing intellectual stimulation can produce a .356 also .674 growth in faculty members' research efficiency. Factors such as "nature of school leadership", "modelling behaviour", "providing individual support", and "strengthening school culture" likewise contributed to faculty members' research production but not to a significant level. It was also shown that school heads' transformational leadership behaviour formed a very substantial set of predictors for the research production of faculty at Bulacan State University.

### Research questions

Answers were provided to the following research questions:

1. How much does collaboration and institutional culture mediate respectively, the nexus between mentorship and the research productivity of academic staff?
2. How much does collaboration and institutional culture mediate respectively, the nexus between institutional support and the research productivity of academic staff?

### Hypotheses

The following hypotheses were tested in the study:

1. The indirect effect of mentorship on the research productivity of academic staff, with collaboration and institutional culture as mediators, is not significantly different from zero.
2. The indirect effect of institutional support on the research productivity of academic staff, with collaboration and institutional culture as mediators, is not significantly different from zero

# Methods

*Research framework and design*

This study adopts the quantitative research method, following the correlational research design. The quantitative research framework was considered owing to the nature of variables and how they were measured. The correlational research design was adopted specifically because it was in the interest of

the researchers to test for several relationships among the predictors, mediators and endogenous variables. Furthermore, “the data used to test mediation analysis are usually correlational, and such data are limited in their capacity to yield clear conclusions regarding causality” (Iacobucci, 2008; p.4).

*Variables of the study*

Five specific variables were considered in this study, including mentorship, institutional support, collaboration, institutional culture and research productivity. Mentorship and institutional support are the core exogenous variable of the study. Collaboration and institutional culture are the two mediating variables of the study, while the research productivity of academic staff is the endogenous/response variable.

*Study participants*

The population of this study comprised all the academic staff from the rank of Lecturer II to Professor in the University of Cross River State (UNICROSS). According to the information gathered from the University’s academic planning unit, there are 327 academic staff in the university that meets the criteria for inclusion in the study (i.e., within the rank of Lecturer II to Professor). This population was considered for the study based on the idea that staff within this category must have earned their doctorate degrees and are fully prepared for research engagements. It is generally believed that many individuals can carry out independent research initiatives after obtaining a doctorate degree. Hence, the decision to focus on this population was to avoid potential bias or skewing the data to be obtained. The population distribution of the study is presented in Table 1. Considering the manageable number of elements in the population (see Table 1), the census approach was adopted to study the entire population. Thus, the participants of this study are 327 academic staff.

Table 1: Population distribution of the study showing the total number of academic staff (from the rank of Lecturer II to Professor) in UNICROSS

| Faculty | Campus | Population |
|---|---|---|
| Agriculture & Forestry | Obubra | 61 |
| Basic Medical Sciences | Okuku | 36 |
| Communication Technology | Calabar | 19 |
| Education | Calabar | 56 |
| Engineering | Calabar | 56 |
| Environmental Sciences | Calabar | 53 |
| Management Sciences | Ogoja | 23 |
| Science | Calabar | 23 |
| Total | | 327 |

*Instrument and Measures*

The instrument used for data collection was a questionnaire tagged: “Career Empowerment and Research Productivity Questionnaire (CERPQ). The tool was designed by the researchers and structured into six sections. Section 1 was aimed at eliciting respondents’ biodata such as age, gender, rank and years of work experience. Sections 2 to 6 were designed with six items respectively, to assess mentorship practices, institutional support practices, collaboration, institutional culture, and research productivity. All the items in sections 2 to 6 of the CERPQ were developed using information derived from a review of related literature. The four points Likert Scale was used in organizing all the items in sections 2 to 6 of the CERPQ. The response options available to all the items in sections 2 to 6 of the CERPQ comprised Strongly Agree, Agree, Disagree and Strongly Disagree.

*Validity and reliability*

The quantitative approach to content validity was adopted by the researchers to determine the extent to which the items pooled to the questionnaire, were rich, relevant and clear in measuring targeted constructs. In achieving this, a group of six independent assessors (three research experts and three educational management experts) at the University of Calabar were consulted. Experts in these two fields were used because we considered the fields as being the most closely related to the variables of the study. The ratings of the experts were used to compute the Item Content Validity Index (I-CVI) and Scale Content Validity Index (S-CVI) of the instrument presented in Table 2. The comments of the experts on unclear and/or irrelevant items were followed by the researchers in developing the second draft of the instrument. The second draft copy of the instrument was subjected to a focus group discussion (FGD) involving ten senior university lecturers from the University of Calabar, who were not part of the study’s targeted respondents. Qualitative discussions were held regarding the suitability of each item to the targeted domain, the adequacy of the items measuring each variable and/or possible omissions. Information from the FGD was used in developing the final draft of the instrument. The final draft of the instrument was trial tested on 30 lecturers at the University of Calabar (who were neither part of the study’s population, nor the FGD) to determine the degree of its internal consistency. Cronbach’s Alpha approach was adopted for the reliability test, with the result of the analysis presented in Table 2.

Table 2: Quantitative content validity indices and Cronbach reliability estimates of the variables in the instrument used for data collection

| Variables | No of items | Range of I-CVI C | Range of I-CVI R | S-CVI C | S-CVI R | α |
|---|---|---|---|---|---|---|
| Mentorship (Exogenous) | 6 | .91 to 1.00 | .91 to 1.00 | .95 | .92 | .87 |
| Institutional support (Moderator) | 6 | .87 to 1.00 | .87 to 1.00 | .90 | .89 | .80 |
| Collaboration (Mediator) | 6 | .96 to 1.00 | .86 to 1.00 | .93 | .87 | .83 |
| Institutional culture (Mediator) | 6 | .85 to 1.00 | .83 to 1.00 | .89 | .85 | .87 |
| Research productivity (Endogenous) | 6 | .93 to 1.00 | .85 to 1.00 | .91 | .89 | .90 |
| Instrument total | 30 | .90 to 1.00 | .89 to 1.00 | .97 | .82 | .85 |

**Key**
I-CVI C = Item Content Validity Index for Clarity
I-CVI R = Item Content Validity Index for Relevance
S-CVI C = Scale Content Validity Index for Clarity
S-CVI R = Scale Content Validity Index for Relevance
α = Cronbach Alpha reliability estimate

*Data collection and analysis procedures*

Primary data were collected for this study, through the administration of copies of the questionnaire. For this study, ethical clearance was not obtained because even though the study involved human subjects, no physical, emotional or social risk was associated with participation in the study. However, before collecting data, respondents were also assured that data solicited will be treated aggregately and used purely for academic purposely. All respondents participated voluntarily in the exercise after clear explanations of the study's objectives were also provided. At the end of the exercise, the researchers were able to gather data from 303 respondents, with the support of three research assistants. A total of 24 targeted respondents could not be reached for one reason or the other, leading to an attrition rate of 7.4%. Nevertheless, the participation rate of 92.6% was considered high enough to proceed with data analysis. For data analysis, all responses were scored, taking into consideration differences in the wording of the items. Data were coded into a spreadsheet package according to the variables. All respondents' biodata were deanonymized in line with the recommended Safe Harbour principles of studies involving human subjects. Structural equation modelling and Bootstrapping techniques were employed in performing the mediation analysis to answer all the research questions and test the hypotheses guiding the study. The analysis was aided using JASP, Haye's PROCESS Macro, and AMOS Graphic software.

*Model specification*

The SEM for the mediation models of this study is specified in general form as:

$Z_1 = \beta_0 + \beta_{p1}X + \varepsilon_{z1}$ …… 1

$Z_2 = \beta_0 + \beta_{p2}X + \varepsilon_{z2}$ …… 2

$Y = \beta_0 + \beta_{p3}Z_1 + \beta_{p4}Z_2 + \beta_{p5}X + \varepsilon_y$ ……..3

Where:

$Z_1$ = the first mediator; $Z_2$ = the second mediator; Y = the endogenous variable; X = the exogenous variable; $\beta_0$ = the intercept or constant term; $\beta_{p1} - \beta_{p5}$ = the standardized regression weights representing partial effects of X, $Z_1$, and $Z_2$ in the model; ε = The error term associated with outcome variable $Z_1$, $Z_2$, and Y.

From the above, we derived the specific linear models of this study by substituting the variables of the study to equations 1 to 3, as follows:

$C = \beta_0 + \beta_M + \varepsilon_c$ ……..4

$IC = \beta_0 + \beta_M + \varepsilon_{Ic}$ ……..5

$RP = \beta_0 + \beta_C + \beta_{IC} + \beta_M + \varepsilon_{RP}$ ……..6

$C = \beta_0 + \beta_{IS} + \varepsilon_c$ ……..7

$IC = \beta_0 + \beta_{IS} + \varepsilon_{IC}$ ……..8

$RP = \beta_0 + \beta_C + \beta_{IC} + \beta_{IS} + \varepsilon_{RP}$ ……..9

Where:

C = Collaboration; IC = Institutional culture; RP = Research productivity; M = Mentorship; IS = Institutional support; $\beta_0$ = Intercept; $\beta_M$, $\beta_C$, $\beta_{IC}$, and $\beta_{IS}$ = partial contribution of mentorship, collaboration, institutional culture, and institutional culture while controlling for the effect of other variables; $\varepsilon_c$, $\varepsilon_{Ic}$, and $\varepsilon_{RP}$ = error terms of the outcome variables such as collaboration, institutional culture, and research productivity.

Following equations 4 to 6, we derived the specific hypothesised structural equation model (SEM) for research question 1 (see Figure 2). Following equations 7 to 9, we derived the hypothesised SEM for research question 2 (see Figure 3).

# Results

*Research question 1*

How much does collaboration and institutional culture mediate respectively, the nexus between mentorship and the research productivity of academic staff in public universities? The result of the structural equation model presented in Figure 4, shows that mentorship, collaboration and institutional support jointly accounts for 34.6% of the total variance in the research productivity of academic staff, with 64.4% of the unaccounted portion of the variance due to other factors not enlisted in the model. The model also showed that 35.3% of the variance in the collaboration among staff is due to mentorship, with the remaining 64.7% of the variance attributable to other predictor variables outside the model. Furthermore, Figure 4 shows that mentorship contributes 3.4% in the development of institutional culture, with the unexplained variance of 96.6% due to other factors not included in the model.

Relatively, mentorship has a significant positive effect on the collaboration among staff (B = .591, $\beta$ = .594, t = 12.842, SE = .046, $p < .05$) and institutional culture in the public university (B = .179, $\beta$ = .186, t = 3.283, SE = .055, $p < .05$) respectively. This implies that a 1% increase in mentorship is associated with a 0.6% and 0.2% change in collaboration and institutional culture respectively, other things being equal. However, the result in Figure 4 revealed that mentorship has a negative but non-significant contribution to the research productivity of academic staff in the public university (B = -.009, $\beta$ = -.016, t = -.278, SE = .028, $p > .05$). It was also revealed that there is an insignificant positive contribution of institutional culture to the research productivity of academic staff (B = .002, $\beta$ = .003, t = .059, SE = .028, $p > .05$). Furthermore, the result in Figure 4, also showed that there is a significant positive contribution of collaboration to the research productivity of academic staff (B = .339, $\beta$ = .597, t = 10.326, SE = .033, $p < .05$). The result suggests that a 1% increase in collaboration among staff improves their research productivity by 0.6%, other things held constant.

Regarding the mediation, the result in Figure 4 shows that mentorship has a total effect of $\beta$ = .339 on academic staff research productivity. Out of this effect, $\beta$ = -.016 is direct and $\beta$ = .356 is indirect. The indirect effect is a result of the mediation of institutional culture and collaboration. Therefore, collaboration and institutional culture mediate respectively, the nexus between mentorship and the research productivity of academic staff in the public university. This implies that when mentorship is practice alone, it reduces the research productivity of academic staff. However, mentorship only promotes research productivity among academic staff, if it is followed by a good institutional culture and collaboration habits.

Research question 2

How much does collaboration and institutional culture mediate respectively, the nexus between institutional support and the research productivity of academic staff in public universities? The result of the analysis presented in Figure 5 shows that institutional support, collaboration and institutional culture are jointly responsible for 35.5% of the total variance in the research productivity of academic staff, with the remaining 64.5% of the unexplained variance due to other factors that are extraneous to the model. It is also shown that institutional support is responsible for 3.6% and 2.5% of the entire variance in collaboration among staff and institutional culture respectively. By implication, the unexplained variance

of 96.4% and 97.5% in collaboration and institutional culture respectively, are attributable to other factors not included in the model.

Partially, the result in Figure 5 shows that institutional support has a significant contribution to collaboration (B = .194, $\beta$ = .190, t = 3.367, SE = .058, $p < .05$), and institutional culture (B = .155, $\beta$ = .157, t = 2.756, SE = .056, $p < .05$) respectively. This result suggests that a 1% improvement in the institutional support provided to academic staff will lead to 0.2% and 0.16% changes in their collaboration practices and institutional culture respectively, other things being equal. However, the result in Figure 5 shows that institutional support has positive but not a significant contribution to the research productivity of academic staff (B = .050, $\beta$ = .087, t = 1.826, SE = .028, $p > .05$). The result in Figure 5 also shows that institutional culture has a negative but not significant contribution to the research productivity of academic staff (B = -.004, $\beta$ = -.007, t = -.140, SE = .027, $p > .05$). Nevertheless, the result in Figure 5 further proved that collaboration has a significant positive contribution to the research productivity of academic staff (B = .326, $\beta$ = .573, t = 12.180, SE = .027, $p < .05$).

In terms of the mediation, the result of the analysis shows that institutional support has a total effect of $\beta$ = .195 on the research productivity of academic staff. The total effect is however proven to be a product of $\beta$ = .087 direct effect and $\beta$ = .108 indirect effect. The indirect effect of institutional support on the research productivity of academic staff is due to the mediation of institutional culture and collaboration. This implies that collaboration and institutional culture mediate respectively, the nexus between institutional support and the research productivity of academic staff. This result suggests that institutional support alone contributes negligibly to the research productivity of academic staff; however, by building a strong institutional culture and collaboration network, the research productivity of academic staff in the university will increase.

Hypothesis 1

The indirect effect of mentorship on the research productivity of academic staff, with collaboration and institutional culture as mediators, is not significantly different from zero. This hypothesis was tested at the 95% confidence interval and .05 alpha level. The result of the analysis in Table 3 confirmed that mentorship has a non-significant negative direct contribution to the research productivity of academic staff. In explaining the significance of the indirect effect, using the bootstrapping technique, we used the lower and upper bounds of the bootstrapped confidence interval. The rule is that the value of the indirect effect must fall between the lower and upper bounds (i.e., it must fall within the range of BootLLCI and BootULCI) to be considered to be greater than zero.

A cursory look at the last part of Table 3 shows that the indirect effect ($\beta$ = .200) of mentorship on the research productivity of academic staff, with collaboration and institutional culture as joint mediators, falls within the range of .142 and .268. This implies that the indirect effect of mentorship on the research productivity of academic staff, with collaboration and institutional culture as mediators, is significantly different from zero. Based on this evidence, the null hypothesis was disregarded, and in its place, the alternative hypothesis is adopted. Therefore, collaboration and institutional culture are joint significant

mediators of the nexus between mentorship and the research productivity of academic staff. This means that if mentorship is followed by effective collaboration practices and institutional culture, it will significantly improve the research productivity of academic staff, other things being equal.

Furthermore, when we controlled for the effect of institutional culture, it was discovered that collaboration partially mediated the nexus between mentorship and research productivity of academic staff to a significant extent ($\beta$ = .200 > .143, but < .268). This implies that we can count on collaboration as having the capacity to boost the research productivity of academic staff even without a favourable institutional culture. On the contrary, institutional culture did not mediate (significantly) the nexus between mentorship and the research productivity of academics while controlling for the effect of collaboration. This implies that the mediation of institutional culture of the nexus between mentorship and the research productivity of academic staff is not significantly different from 0.

Table 3: Summary of results showing the contribution of mentorship to the research productivity of academic staff with institutional culture and collaboration as mediators of the nexus

| Outcome variable | R | R-Sq | MSE | F | df1 | df2 | P |
|---|---|---|---|---|---|---|---|
| Collaboration | .594 | .353 | 4.841 | 164.365 | 1 | 301 | .000 |
| | Model | Coeff | Se | t | P | LLCI | ULCI |
| | Constant | 6.982 | .693 | 10.069 | .000 | 5.618 | 8.347 |
| | Mentorship | .591 | .046 | 12.820 | .000 | .500 | .681 |
| Institutional culture | R | R-Sq | MSE | F | df1 | df2 | P |
| | .186 | .034 | 6.836 | 10.743 | 1 | 301 | .001 |
| | Model | Coeff | Se | t | P | LLCI | ULCI |
| | Constant | 12.496 | .824 | 15.166 | .000 | 10.875 | 14.118 |
| | Mentorship | .179 | .055 | 3.278 | .001 | .072 | .287 |
| Research Productivity | R | R-Sq | MSE | F | df1 | df2 | P |
| | .589 | .347 | 1.585 | 52.848 | 3 | 299 | .000 |
| | Model | Coeff | Se | t | P | LLCI | ULCI |
| | Constant | 10.645 | .547 | 19.463 | .000 | 9.569 | 11.721 |
| | Mentorship | -.009 | .033 | -.280 | .780 | -.074 | .055 |
| | Collaboration | .339 | .034 | 9.935 | .000 | .272 | .406 |
| | Institutional culture | .002 | .029 | .057 | .954 | -.055 | .058 |
| The direct effect of X on Y | Effect<br>-.009 | Se<br>.033 | t<br>-.280 | P<br>.780 | LLCI<br>-.074 | ULCI<br>.055 | |
| Indirect effect(s) of X on Y: | | Effect | BootSE | BootLLCI | BootULCI | | |
| | Total | .200 | .032 | .142 | .268 | | |
| | Collaboration | .200 | .032 | .143 | .268 | | |
| | Institutional culture | .000 | .006 | -.012 | .012 | | |

Model: 4; Y = Research Productivity; X = Mentorship; M1 = Collaboration; M2 =Institutional culture; Sample Size = 303

From Table 3, the following linear equations were fitted:

$C = 6.982 + 0.591_M + 0.693$ ……..……..……...10

$IC = 12.496 + 0.179_M + 0.824$……..……..…..11

$RP = 10.645 + 0.339_C + 0.002_{IC} - 0.009_M + 0.547$……..……..…….....12

Hypothesis 2

The indirect effect of institutional support on the research productivity of academic staff, with collaboration and institutional culture as mediators, is not significantly different from zero. The result of the analysis presented in Table 4 shows that the research productivity of academic staff received a total indirect effect of $\beta = .063$ from the joint mediation of institutional culture and collaboration. The joint mediation of collaboration and institutional culture was proven to be significantly different from zero. Consequently, the null hypothesis was discarded, while the alternative hypothesis (which states that the indirect effect of institutional support on the research productivity of academic staff, with collaboration and institutional culture as mediators, is significantly different from zero), was upheld. This indicates that although the provision of institutional support alone is not a strong factor in boosting the research productivity of academic staff significantly ($\beta = .050$, SE = .028, t = 1.829, $p > .05$), accompanying it with effective collaboration and institutional culture uplifts the research productivity of academic staff significantly.

Table 4: Summary of results showing the contribution of institutional support to the research productivity of academic staff with institutional culture and collaboration as mediators of the nexus

| Outcome variable | R | R-Sq | MSE | F | df1 | df2 | P |
|---|---|---|---|---|---|---|---|
| Collaboration | .190 | .036 | 7.213 | 11.298 | 1 | 301 | .001 |
| | Model | Coeff | Se | T | P | LLCI | ULCI |
| | Constant | 12.973 | .833 | 15.580 | .000 | 11.334 | 14.611 |
| | Institutional support | .194 | .058 | 13.361 | .001 | .080 | .307 |
| Institutional culture | R | R-Sq | MSE | F | df1 | df2 | P |
| | .157 | .025 | 6.906 | 7.573 | 1 | 301 | .006 |
| | Model | Coeff | se | T | P | LLCI | ULCI |
| | Constant | 12.949 | .815 | 15.894 | .000 | 11.345 | 14.552 |
| | Institutional support | .155 | .056 | 2.752 | .006 | .044 | .266 |
| Research Productivity | R | R-Sq | MSE | F | df1 | df2 | P |
| | .595 | .354 | 1.568 | 52.514 | 3 | 299 | .000 |
| | Model | Coeff | se | T | P | LLCI | ULCI |
| | Constant | 10.086 | .585 | 17.229 | .000 | 8.934 | 11.238 |
| | Institutional support | .050 | .028 | 1.829 | .068 | -.004 | .105 |
| | Collaboration | .326 | .028 | 11.594 | .000 | .270 | .381 |
| | Institutional culture | -.004 | .029 | -.134 | .894 | -.060 | .053 |
| The direct effect of X on Y | Effect | Se | t | P | LLCI | ULCI | |
| | .050 | .028 | 1.829 | .068 | -.004 | .105 | |
| Indirect effect(s) of X on Y: | | Effect | BootSE | BootLLCI | BootULCI | | |
| | Total | .063 | .021 | .021 | .105 | | |
| | Collaboration | .063 | .021 | .022 | .104 | | |
| | Institutional culture | -.000 | .005 | -.010 | .011 | | |

Model: 4; Y = Research Productivity; X = Institutional culture; $M_1$ = Collaboration; $M_2$ =Institutional culture; Sample Size = 303

When we controlled for the effect of institutional culture, the result showed that collaboration has a significant partial mediation of the nexus between institutional support and the research productivity of academic staff. This implies that the indirect effect of institutional support on the research productivity of academic staff, with collaboration as the mediator, is significantly different from zero. On the other hand, institutional culture did not significantly mediate the nexus between institutional support and the research productivity of academic staff after controlling for the effect of collaboration; thus, its partial mediation is not significantly different from zero. This implies that when there is no collaboration, we cannot count on institutional culture alone to mediate the nexus between institutional support and the research productivity of academic staff, other things being equal.

Using the result in Table 4, the following linear equations were fitted:

$C = 12.973 + 0.194_{IS} + 0.833$ ……..13

$IC = 12.949 + 0.155_{IS} + 0.815$ ……..14

$RP = 10.086 + 0.326_{C} - 0.004_{IC} + 0.050_{IS} + 0.585$ ……..15

# Discussion

This study discovered that mentorship has a negative but non-significant contribution to the research productivity of academic staff in the public university. This implies that when mentorship is practice alone, it reduces the research productivity of academic staff. However, this study showed that mentorship only promotes research productivity among academic staff, if it is followed by a good institutional culture and collaboration habits. The result is not surprising; most early careers tend to be facing a lot of oppression from their superiors. The negative contribution of mentorship to the research productivity of academics is attributed to the quality of guidance mentors provide to mentees. It seems to be common knowledge in the area of study that mentorship is often beneficial to the mentor than the mentees who are often seen running errands and supporting the senior staff than the other way around. Most mentees also seem to be facing strong oppression from their supposed mentors who often rely on mentees in the production of scientific knowledge. This often makes some of the so-called mentors to be more dependent on mentees for academic survival against the development opportunities they ought to provide; hence the finding of this study. Consequently, most junior academic staff tend to be ignored by their mentors after reaching self-actualisation. These kinds of ugly situations could make mentorship an unappealing journey for the mentee, thus contributing negatively to their productivity.

The finding of this study agrees with the result of Okurame cited in Undiyaundeye and Basake (2017), that mentoring relationships are often useful to the senior partner in the union, as it provides an opportunity for them to develop a base for technical support and power. This finding corroborates the finding of Chitsamatanga et al. (2018) that mentoring is there in universities theoretically, but the practical concept appears to be surrounded by grey areas. The cited study also showed a general lack of interest and knowledge among academics on mentoring and networking. However, the result disagrees with the evidence of other studies which established a positive relationship between mentorship and the research productivity of academic staff in public universities (Abugre & Kpinpuo, 2017; Arkaifie & Owusu-Acheampong, 2019; Carmel & Paul, 2015). The difference in the results of the cited studies and the present study is attributed to differences like the environment where the studies were conducted as well the quality of information obtained from the respondents.

Nevertheless, the present study established that mentorship has a significant positive effect on the collaboration among staff and institutional culture in public universities respectively. This implies that mentoring academic staff tends to promote the extent to which they engage in research endeavours with other scholars within or outside the university community. In terms of institutional culture, mentoring can play a significant role in shaping the ideas of mentees and mentors to develop policies that can guide the operations of the university. Besides, mentorship can be used to pass the culture of an institution to future generations of scholars. Again, the indirect effect of mentorship on the research productivity of academic staff, with collaboration and institutional culture as joint mediators, is statistically significant. This implies that effective collaboration among researchers and a positive institutional culture can be used to promote the research productivity of academic staff regardless of the mentorship practices in the institution.

When we controlled for the effect of institutional culture, we found that collaboration partially mediated the nexus between mentorship and research productivity of academic staff to a significant extent. This implies that we can count on collaboration as having the capacity to boost the research productivity of academic staff even without a favourable institutional culture. This corroborates the finding of Alaa and Ahmad (2020) collaboration has the highest positive and significant impact on research productivity. This revelation is not surprising because some policies of a university, which constitutes a part of its norms, often tend to hinder the research productivity of scholars in terms of the number of scholarly works they can publish. For instance, when some universities initiated the policy for scholars to publish in high-ranking journals, as an unusual trend, it was received as a harsh culture by some scholars. Many staff had to face the reality of paying so much to publish open access in top-rated journals, with some committing more efforts to publish in free top-ranking journals. It was observed that many scholars made a headway (in the face of what many regard as a harsh policy), through intradisciplinary, transdisciplinary, multidisciplinary and interdisciplinary collaborations with other scholars. This could explain the power that collaboration has on the research productivity of academic staff. Besides, other scholars have also shown that collaboration facilitates the generation and selection of original ideas, due to the synergies obtained from scientists with complementary backgrounds or even from different disciplines (Rigby & Edler, 2005; Katz & Martin in Abramo, D'Angelo & Murgia, 2017).

It was also established in the current study that institutional culture did not mediate (significantly) the nexus between mentorship and the research productivity of academics while controlling for the effect of collaboration. This result suggests that if we take away collaboration from the university system, institutional culture alone does not strengthen the effect of mentorship on the research productivity of academic staff in universities. The result is expected because institutional culture is a way of life in the organisation that individuals must follow. Thus, the nature and quality of the norms may be more important in deciding the activities of the people. A poor institutional culture means that poor practices will be promoted frequently. Therefore, institutions without a strong research policy may not have a research productive workforce, unless through the intervention of other variables. This result tallies with the finding of Hadjinicola and Soteriou (2006) which reveals that three factors (the presence of a research centre, funding received from external sources for research purposes and better library facilities) increased the research productivity and the quality of the articles published by the professors in the Business schools. This shows that a quality institutional research culture is necessary to promote the research productivity of academic staff.

In the second aspect of the study, we discovered that institutional support has a positive but not a significant contribution to the research productivity of academic staff in public universities. This finding implies that a high rate of institutional support is not associated with a high degree of research productivity among academic staff. This finding may have been like this owing to the discouraging institutional support opportunities offered to the academic staff of universities in this part of the world. Furthermore, opportunities such as grants for research, funding support, visible research dissemination avenues are not often available in institutions, and where they are, access to such support systems seems to be politicised or utilised for private gains. This result does not support the study of Salau et al.

(2018) which identified meaningful work and growth opportunities as predictive factors for maximising productivity in the sampled institutions. Admittedly, the result of the cited study seems to be applicable in an ideal situation; the norm where the present study was carried has been proven to be the opposite. Nevertheless, it was discovered that institutional support has a significant contribution to collaboration and institutional culture respectively. This result was anticipated because the support offered to academics should enable them to have the resources to network effectively with other scholars. Furthermore, a university that offers to staff will also be able to develop a good policy/culture that ensures that beneficiaries of institutional support utilise such opportunities for school improvement.

The joint mediation of collaboration and institutional culture was proven to be significant on the nexus between institutional support and the research productivity of academic staff in public universities. This indicates that although institutional support alone is not a strong factor to boost the research productivity of academic staff significantly, accompanying it with effective collaboration and institutional culture uplifts the research productivity of academic staff significantly. When we controlled for the effect of institutional culture, the result showed that collaboration has a significant partial mediation of the nexus between institutional support and the research productivity of academic staff. On the other hand, institutional culture did not significantly mediate the nexus between institutional support and the research productivity of academic staff after controlling for the effect of collaboration. This implies that when there is no collaboration, we cannot count on institutional culture alone to mediate the nexus between institutional support and the research productivity of academic staff, other things being equal.

# Conclusion

This study was designed to estimate the direct and indirect contributions of two career empowerment variables – mentorship and institutional support to the research productivity of academic staff at a public university in Cross River State. Two mediator variables – collaboration and institutional culture were introduced to determine their roles in the nexus between the predictor and the outcome variable. The study discovered several meaningful relationships among the variables of the study. It is concluded generally, based on the result of this study that mentorship has a negative contribution to the research productivity of academic staff unless if supplemented with a strong institutional culture and collaboration network. It is concluded that institutional support has a positive but non-significant tie with the research productivity of academic staff; however, the effect will become significant in the face of collaboration and a positive institutional culture. Collaboration is the most important factor that boosts directly the research productivity of academic staff and that can also mediate the contributions of other variables to the research productivity of academic staff.

### Recommendations

Based on the conclusion of this study, the following recommendations were made:

1. Academic staff in universities should work very hard to build a strong network and linkages with other scholars at the institutional, regional, national and international levels. This will enable them to maximise fully the benefits associated with research collaboration and boost research productivity.
2. Universities should ensure that academics are provided support through means such as the provision of retraining opportunities, research grants, funding support to externally funded researches, study fellowships, setting up research laboratories and up-to-date libraries, subscribing to online repositories and stores for access to paywalled literature materials, providing conference and publication support and so on.
3. Universities should often ensure that research-focused policies are also initiated in addition to those of teaching and community services to promote positive research culture. State-of-the-art research policies and initiatives should be constantly included in the conditions of service for academic staff to follow global best practices in their research engagements.
4. Senior academics, seasoned/fully established scholars should make it a habit of always mentoring younger colleagues or students towards becoming good at research-related matters. The idea/practice of always using mentees to fulfil academic dreams by mentors should be avoided, rather mentors should concentrate on imparting positively on the mentees.

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# Declarations

The authors state that this is a unique research study conducted by the researchers.

Funding: This research received no external funding.

**Competing interests:** The authors state that no competing interests exist for this research.

**Data and material availability:** The authors state that the data for this research were acquired from primary sources through a survey (administration of questionnaires). The data used or analysed for this research are accessible upon reasonable request from the corresponding author.

**Contributions of the authors:** E. A.: Problem identification, background writing, literature review, data collection, editing, and supervision. V. J. O.: Study design, instrument design, data collection/analysis, results interpretation and discussion. E. G. A. data gathering, cleansing, and editing. The work was approved by all of the authors.

**Ethics approval:** Ethics approval was not required for this research since there was no danger connected with participating in it. Furthermore, respondents' personal data were utilized for aggregate data analysis.

**Consent to participate:** All participants gave their consent to engage in this study, and there was a clear understanding between the researchers and the participants that the data collected from them would only be aggregated without the revealing of their identities. All the personal data of respondents were treated following the Safe Harbour principles.

**Consent for publication:** All participants acknowledged that the researchers may publish the information they supplied as long as it is handled confidentially and at the aggregate level without revealing their identities.

# Figures

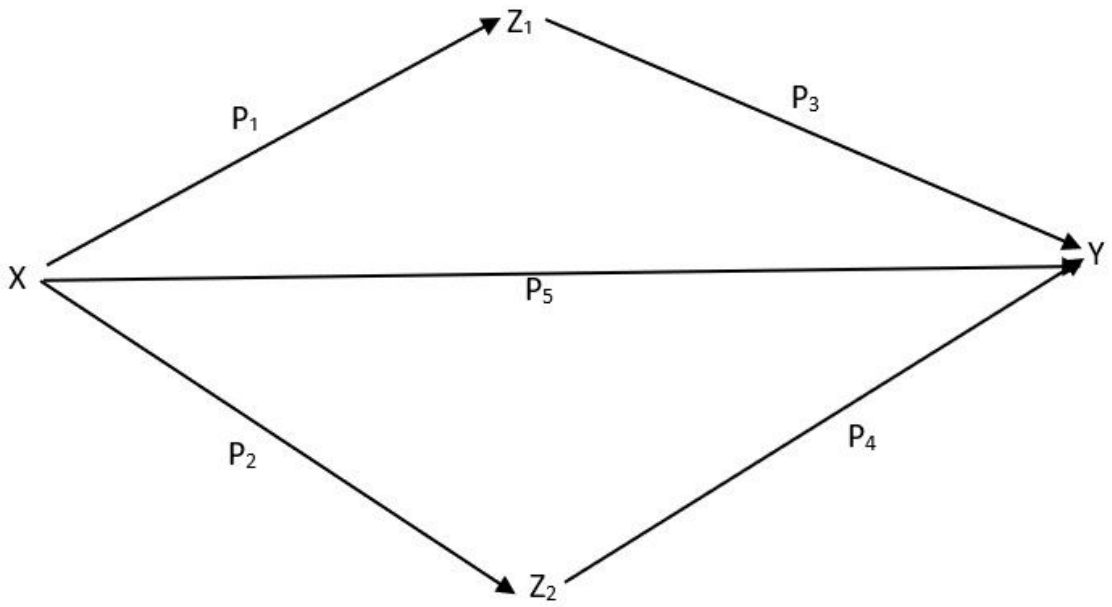
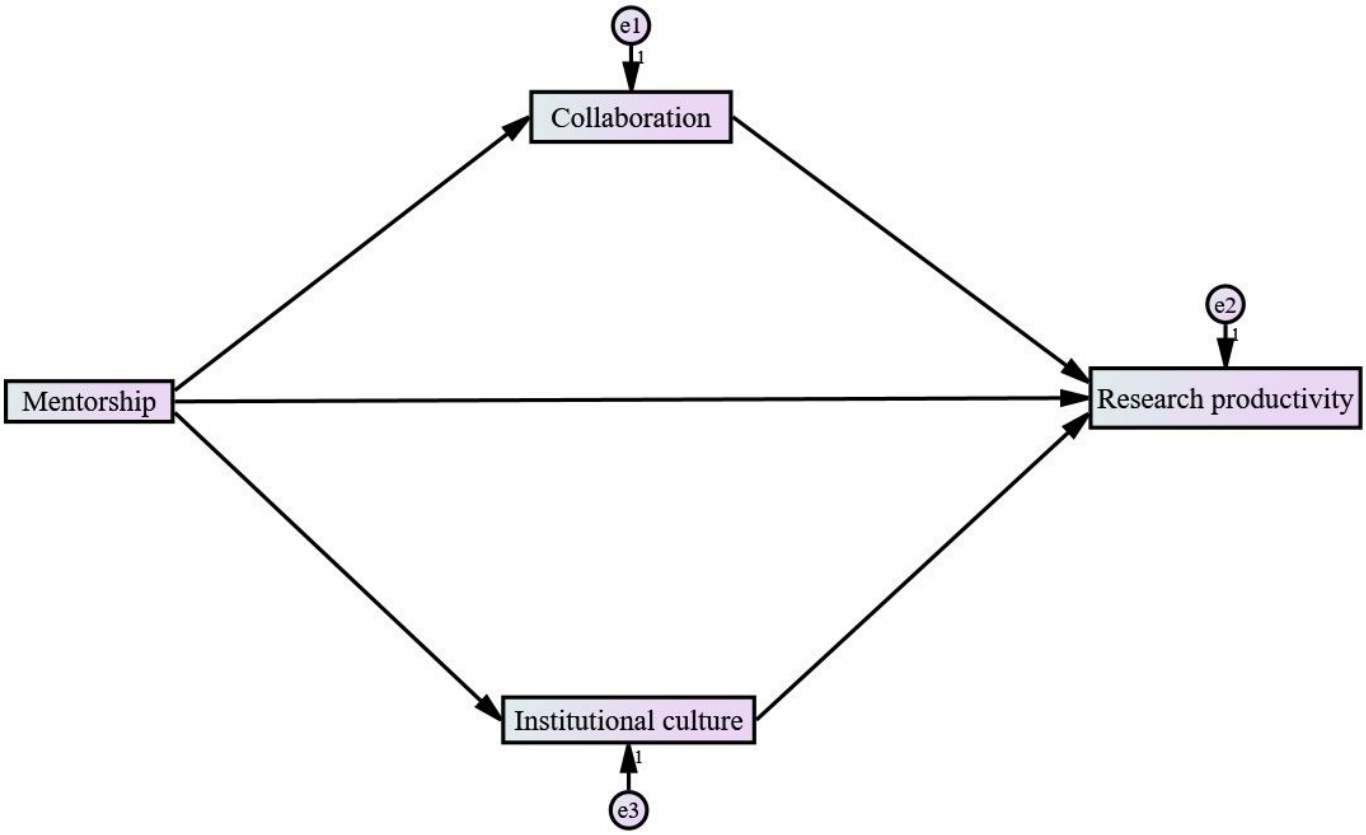


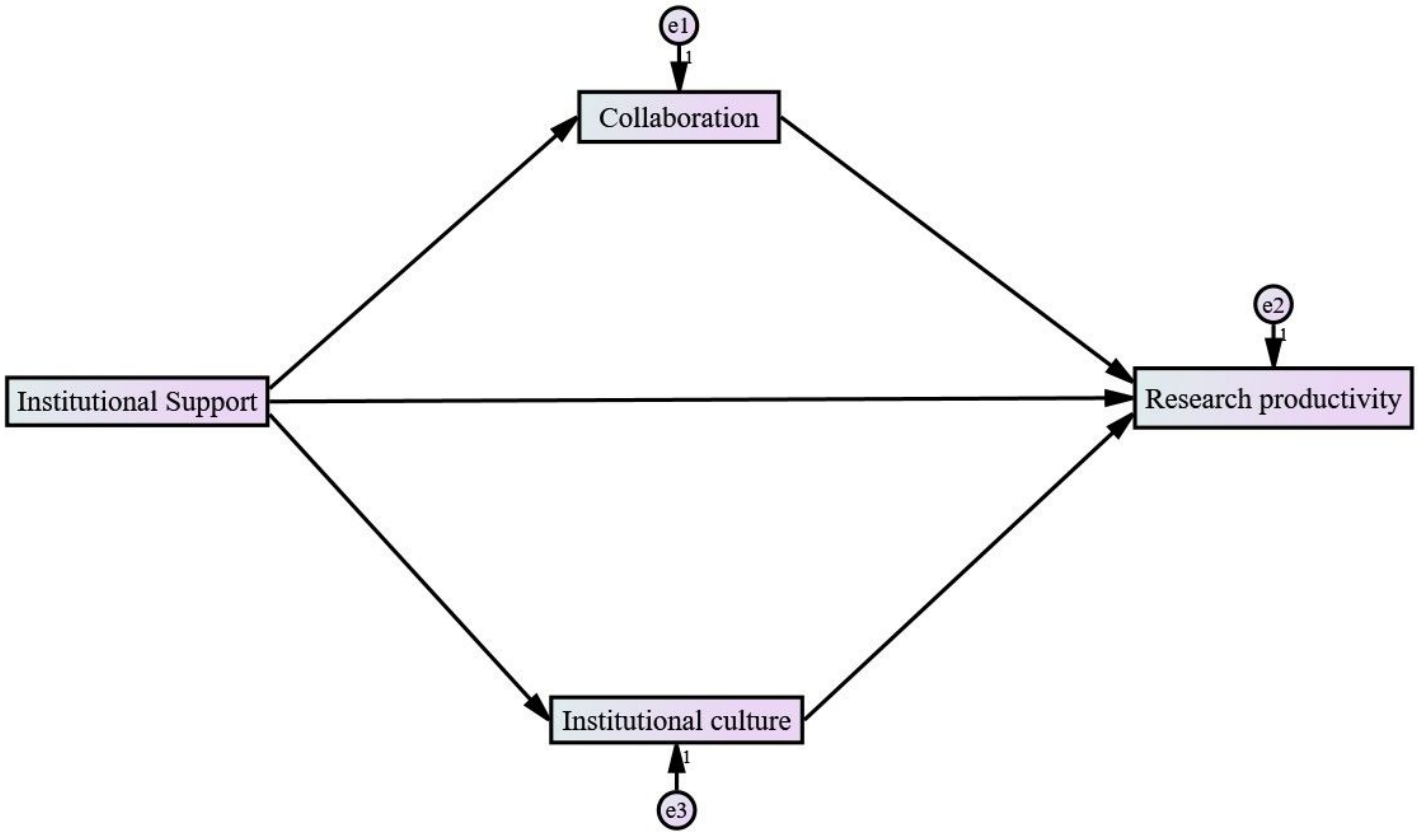

**Figure 1**

Two-factor mediation model showing causal relationships in general form



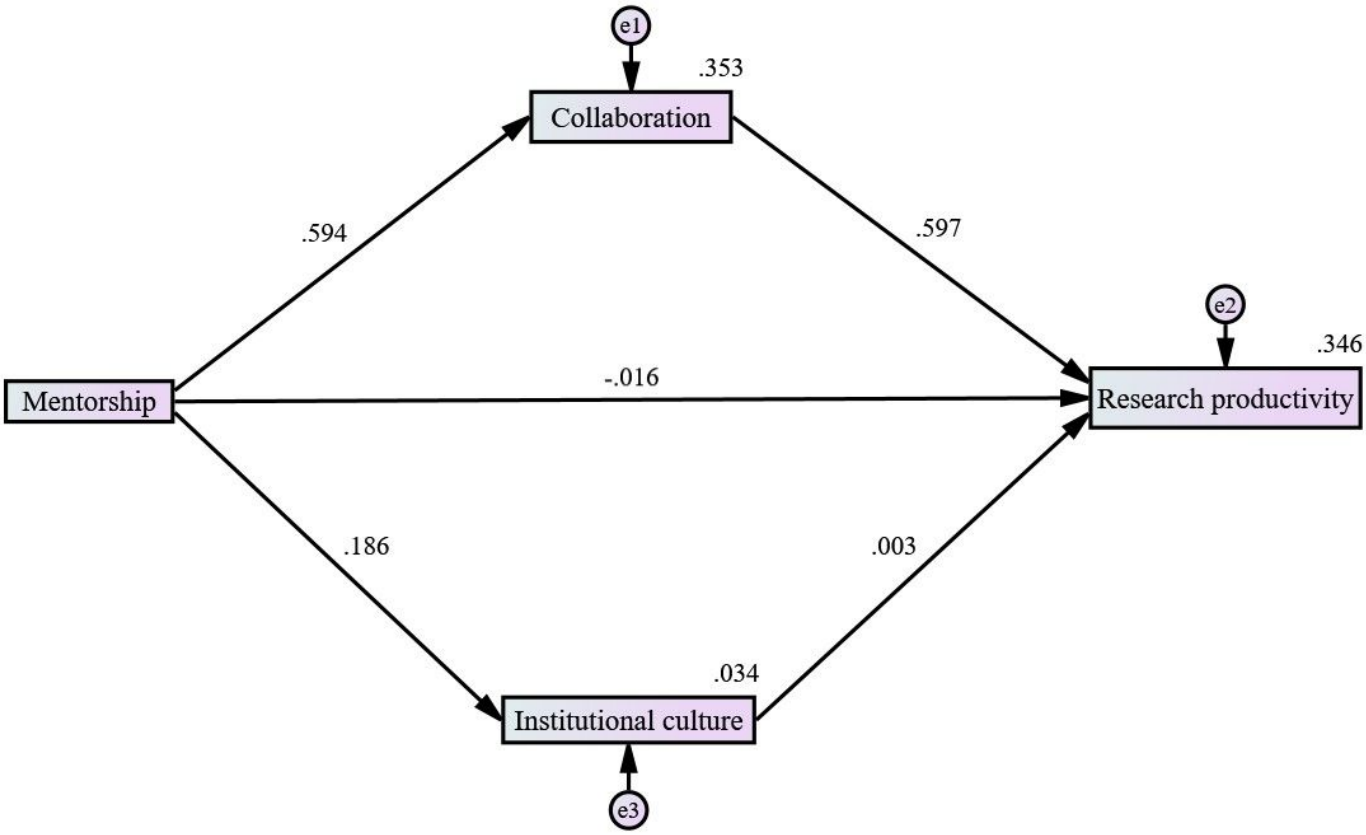

## Figure 2

A hypothesised model of the contribution of mentorship to the research productivity of academic staff, with collaboration and institutional culture as mediators



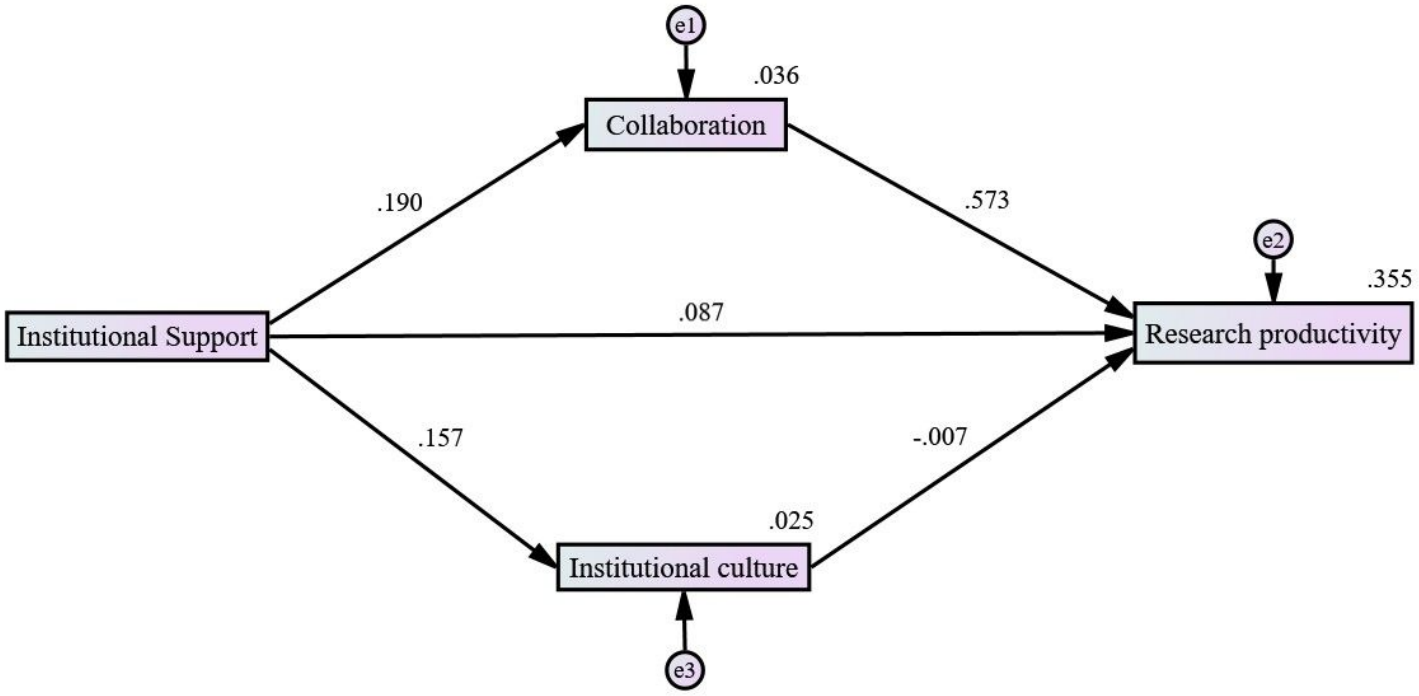

## Figure 3

A hypothesised model of the contribution of mentorship to the research productivity of academic staff, with collaboration and institutional culture as mediators




## Figure 4

A structural equation model of the contribution of mentorship to research productivity of academic staff, mediated by collaboration and institutional culture




## Figure 5

A structural equation model of the contribution of institutional support to the research productivity of academic staff, mediated by collaboration and institutional culture