

## Assessment of Mentoring Praxis in Undergraduate Training among Science Education Lecturers

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### Abstract

*Moral decadence, dropout instances, and a reduced academic performance are common among undergraduates. This may be owed to the relationship between University Staff and undergraduates. Mentoring has been used in various forms to monitor and reform youth behavior. This Study explores the knowledge and practice of mentoring in the training of undergraduate science teachers by their Lecturers. The Study is of descriptive design. Population of the study is made up of all Education Lecturers in the Universities in Ekiti State, Nigeria. The sample size is 74, which is the present total number of Science Education Lecturers in the Universities in Ekiti State and selected through purposive sampling technique. The instrument used, was a face and content validated questionnaire. Reliability was done using test retest method and the reliability value of 0.88 was obtained through, Pearson Moment Correlation. Two hypotheses were formulated and tested using regression analysis. The result revealed a considerable knowledge of mentoring, mentoring impact on lecturing practices and influence of mentoring on undergraduates' learning outcome. It was concluded through the results that Mentoring should be part of Lecturers' obligatory role to undergraduates and the study recommends that Lecturers should endeavor to willingly create time to mentor their students.*

**Keywords:** Knowledge, Mentoring practice, Undergraduates, Science Education, Lecturers

### Introduction

Being an undergraduate is highly demanding. Despite that completing a college degree confers a range of financial, social, and health benefits, about 30% of incoming undergraduates drop out before their graduation year (Ma et al., 2016). It has been observed that dropping out of School is common with first-year Students Engle & Tinto (2008) especially for those with low-income and broken homes populations. The complex University administrative structure can exert in Students, feelings of uncertainty on how to access her services, which may increase stress and delay their access to Campus resources and inadvertently affect their academic performances. The advent of COVID-19 pandemic exacerbated these challenges in many Institutions of higher learning, and highlighted the need for innovative strategies that improve Students' support experiences. (Adebisi, 2021). Undergraduates' engagement with Campus' human and material resources often leads to positive academic outcomes and connectedness to the University (Wilson & Gore, 2013), particularly among the marginalized Students. Researchers have discovered that using social and academic support services is associated with better grades (Crisp et al., 2015) and lower stress (Garriott & Nisle, 2018) for both the Staff and undergraduate Students. An established sense of belonging comes about as the result of positive relationships and connections a Student makes with peers and adults within the School environment.

Mentoring is identified as an act of supporting and encouraging people to manage their own learning in order to maximize their potential, develop their skills, improve their performance, and become fulfilled. Mentoring involves communication and is relationship based. It is a process of informal transmission of knowledge, physiological support, career and professional development, usually a face-to-face between a person perceived to have greater relevant knowledge, wisdom and experience and a person perceived to have less (Wikipedia, 2009). It can be identified as an effective tool for personal development and empowerment. Mentoring is a continuous process of learning with a major impact on the Mentees, Mentors and the Organization.

In a mentoring process, there is always the Mentor who is usually the more knowledgeable, better experienced and more matured personality, and the Mentee/ protégé, who is less experienced,

less knowledgeable and usually less mature in the task on which he/she requires mentoring. Mentor Set (2008) described mentoring as a partnership between two people (Mentor and Mentee) working in similar field or sharing similar experiences and based on mutual trust and respect. Mentoring program is an intervention that is currently gaining popularity worldwide and has been harnessed in various ways to improve Students' knowledge, attitude and performances in Science learning (Olu-Ajayi, 2017).

Mentoring interventions has been used to curb inadequacies of at-risk Students as noted by McPartland & Nettles (1991) that a positive, caring adult could offer an at-risk Student substantial emotional, material, and instructional support that would supplement the many needs not met by the Student's family or through traditional Education. It is also noted by Johnson (2007) that Students who lack caring and willing role models are often times prone to make poor decisions. Because School Personnel are aware of the need to help Students towards being productive members of Society, there is the need to employ strategies and reforms to reach them. Mentoring could be one of such strategies. Mentoring was often viewed as one of the best beneficial and cost-effective approaches to assisting a targeted number of Students (Becker, 2004).

Professional benefits occur for Mentors when they articulate and model pedagogical knowledge, which also includes implementing Education system requirements such as Curricula, aims, and Policies (Hudson 2010). A reasonable number of researches reported on the abundance of professional support and positive impacts of mentoring for the Mentors and Mentees, the Schools, Education systems and associated Communities (Beutel & Spooner-Lane 2009; Rippon & Martin 2006; Tang & Choi 2005; Zachary 2009; Hobson, Ashby; Malderez, & Tomlinson 2009). Other 'adult relationships' and 'adult role models' have been recognized as a developmental Asset, Probst (2006) and it has been contended that the more the Developmental Assets a young person possesses, the lower their at-risk status.

Mentoring have also been identified as the popularly known practice in building relationships between adults and youths (Coffman, 2009). Beginning in the early 1980's and continuing to modern day, formal mentoring programs have been created in response to the need for positive adult influences in the lives of at-risk youth (Sipe, 2002 in Coffman, 2009). The importance of an effective mentoring relationship forms the periphery of the mentoring process which is corroborated by many factors which include: the Mentor-Mentee personal and professional qualities Rippon & Martin (2006), Mentor's characteristics and behaviours Hudson (2010), the environment or context within which it operates and the selection and pairing of the Personnel involved in the relationship (Hobson et al. 2009).

The core reason for every University Establishment are; teaching, research and community service/development. To be able to achieve these, there is the need to employ professionally effective Lecturers who are required to impart the necessary knowledge and skills to Students through research and teaching. Teacher-Students relationship is of vital relevance to the learning of individual subject and at every educational level (Burrows 2011). It is required of Teachers to be able to measure their Students' academic abilities in the pedagogical content through their performances (Kriner, 2004). Teachers need professional development to keep current with teaching practices, though costs for extensive professional development can be prohibitive across an Education System. Mentoring provides one way for embedding cost-effective professional development (Hudson, 2013).

Advisably, Students should trust their teachers to guide them through their challenges, even when unaware of these challenges. The importance of Science Education to every Society cannot be overemphasized. Thus in the University System, Science teaching is highly esteemed and professionally engaged. For a Science Educator to be effective pedagogically, he/she should have the mastery in his/her area of specialization by possessing skills and ability to present instructions to Students using standardized and acceptable methods that meet the learning needs of the Students.

Science Educators are required to use varying teaching methods to arouse Students' interest in the learning process. Science Educators' job effectiveness involve the ability to display the right attitude to work, being conscientious and dedicated to teaching roles, to be vibrant in lesson presentation, to identify and access appropriate teaching methods, as well as making deliberate effort towards the attainment of educational goals. Effective Educators employ an' interactive Class' where Lecturers interact very well with Students in the learning environment and encourage Students' participation in the learning exercise. Pedagogy effectiveness is the ability of teachers to enthuse good

qualities in Students with consideration of their different abilities, while incorporating instructional objectives and assessing the effective learning mode of Students. They are also required to evaluate Students' performance through continuous assessment in line with the University requirements. More so, they should be accessible to the Students as demanded by the University System. Teaching in the University is very demanding hence, Lecturers often experience difficulties in the transition of roles from Lecturers to Mentors.

It is a wise saying, that an effective Teacher is better than the beautiful Classrooms, sophisticated equipment and the best textbooks. This can be construed in terms of Teachers' ability to motivate learners, inculcate discipline, coordinate their classrooms, encourage learners' academic achievement, modify Students' sociality and make the School relevant to the Community. Pedagogy effectiveness subsumes the measure of the instructional objectives, and it is the biggest contributor to Students' success.

### **Statement of the Problem**

Lecturers are so busy that willingly creating time for informal transmission of knowledge and psychological support to undergraduates become sacrificial and cumbersome. Nevertheless Students/Lecturer relationship is required for an overall development and success in the University. Many undergraduates are prone to 'risk behaviour' of wrong attitude to learning, Students failure, dropping out of School, taking wrong decisions, expulsion, wrong peer influence even cultism out of fear and intimidation resulting from Student/Teacher barrier in the School system. This have resulted to some form of unrest in our Societies.

### **Purpose of Study**

The study aims at investigating the Lecturers' knowledge about mentoring, practices of mentoring among Science Lecturers to their Students and how mentoring practices affects Lecturers' effectiveness and undergraduates' learning outcome. The study aimed at doing this by;

- i. measuring the Science Lecturers' knowledge of mentoring in relation to their practicing it with undergraduates. Since one can only give what he/she have knowledge of. The knowledge will determine the practice, which is whether or not to practice mentoring.
- ii. determining the need to mentor undergraduates by finding answer to whether or not the Lecturers are to mentor or only lecture Science undergraduates
- iii. investigating the impact of Lecturers' attitude towards mentoring.
- iv. determining the influence of mentoring on undergraduates' learning outcome.

### **Research Questions**

The following research questions were raised for the study:

- i. Are the Science Education Lecturers knowledgeable about mentoring?
- ii. Should science lecturers willingly mentor their students or just serve their obligatory role?

### **Research Hypotheses**

The following null hypotheses are tested in the study:

- i. There is no significant impact of Lecturers' attitude on their mentoring practice.
- ii. There is no significant influence of mentoring on undergraduates learning outcome.

### **Methodology**

The study employed descriptive survey method. The population was made up of all Science Education undergraduates in Ekiti State owned Universities. The sample consists seventy four (74) Science Education Lecturers selected through purposive and total sampling techniques. The instrument used for the study was a self-constructed questionnaire for Lecturers. The face and content validity of the instrument were ensured by specialists in Science Education and Education Psychology, it's reliability was ascertained through test-retest method and a reliability coefficient value of 0.84 was obtained using Pearson's Product Moment Correlation.

**Results**

**Research question 1:** Are Science Education Lecturers knowledgeable about mentoring?

**Table 1: Knowledge of Science Lecturers about mentoring.**

S/N	ITEMS	SA	A	D	SD	MEAN
1	There is need for Lecturer/Student mentoring in University Community	48 (64.9)	16 (21.6)	10 (13.5)	-	3.51
4	Every student need to be monitored	34 (45.9)	25 (33.8)	15 (20.3)	-	3.26
6	There should be formal mentoring in University Community	15 (20.3)	35 (47.3)	20 (27.0)	4 (5.4)	2.82
9*	Not every Student required to be mentored		24 (32.4)	40 (54.1)	10 (13.5)	2.81
10	All Lecturers are not knowledgeable about mentoring	63 (85.1)	11 (14.9)	-	-	2.85
18	There is laxity in discipline among undergraduates	14 (18.9)	42 (56.8)	9 (12.2)	9 (12.2)	2.82
20	Mentoring should be a course of study in the University	9 (12.2)	35 (47.3)	21 (28.4)	9 (12.2)	2.59
23	Mentoring is relationship based	23 (31.1)	51 (68.9)	-	-	3.31
24	Mentoring is a process of informal transmission of knowledge	14 (18.9)	40 (54.1)	20 (27.0)	-	2.92

*Criterion mean = 2.50, \*Negative items are reversed.*

Table 1 presents the knowledge of Science Lecturers about mentoring. Using the criterion mean scores of 2.50 as cut-off to determine affirmative of each statement, the result indicates that all the items had mean scores above the cut-off point. This implies that Science Lecturers are knowledgeable about mentoring.

**Research Question 2:** Do Lecturers mentor their Students or just serve their obligatory role?

**Table 2: Lecturers mentoring practice**

S/N	ITEMS	SA	A	D	SD	MEAN
2*	The relationship between Staff and Student is not adequate for learning	9 (12.2)	15 (20.3)	49 (66.2)	1 (1.4)	2.57
3*	There are barriers in the relationship between Lecturers and their Student	10 (13.5)	23 (31.1)	30 (40.5)	11 (14.9)	2.57
12*	It is out of place to counsel your Student on their personal matters	10 (13.5)	45 (60.8)	19 (25.7)		3.12
27a	Lecturers are so busy to have time for mentoring		52 (70.3)	13 (17.6)	9 (12.2)	2.58
25	Mentoring is practicable in University Community	19 (25.7)	45 (60.8)	10 (13.5)		3.12
		<b>Very likely</b>	<b>Likely</b>	<b>Unlike ly</b>	<b>Very unlike</b>	

					ly	
27	Do you Students seek you opinion or advice on issues bothering their mind	39 (52.7)	20 (27.0)	15 (20.3)		3.32
29	Can you plead for Students with other Lecturers	22 (29.7)	36 (48.6)	16 (21.6)		3.08
30	Do your Students report issues pertaining to their academics to you	39 (52.7)	25 (33.8)	10 (13.5)		3.39
31	How available are you to your Students	28 (37.8)	35 (47.3)	11 (14.9)		3.23
	Can your Students confide in you	23 (31.1)	8 (10.8)	33 (44.6)	10 (13.5)	2.59
		<b>Yes</b>	<b>No</b>			
36	My Students feel free to discuss with me in my office	64 (86.5)	10 (13.5)			1.86
37	I give advice to my Students on personal issues	59 (79.7)	15 (20.3)			1.80
38	I sometimes provide to meet my Student's needs	74 (100.0)				2.00
40	I create time to counsel the 'at risk' type of Students I discover.	59 (79.7)	15 (20.3)			1.80

*Criterion means = 2.50; 1.50, \*Negative items are reversed.*

Table 2 presents Lecturers mentoring practice. Using the criterion mean scores of 2.50 and 1.50 as cut-off to determine affirmative of each statement, the result indicates that all the items had mean scores above the cut-off point. This implies that Lecturers should mentor their Students and not just serve their obligatory role.

### Testing of Hypotheses

**Hypothesis 1:** There is no significant impact of Lecturers' attitude on their mentoring practice.

**Table 3: Regression analysis showing the impact of Lecturers' attitude on their mentoring practice**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta (β)		
(Constant)	1.000	3.826		.261	.795
Lecturers' attitude towards mentoring	.781	.088	.724	8.899	.000

Multiple R = 0.724  
 Multiple R<sup>2</sup> = 0.524  
 Adjusted R<sup>2</sup> = 0.517  
 F<sub>1,72</sub> = 79.194  
 p = 0.000

\*p<0.05

Table 3 shows that there is significant impact of Lecturers' attitude on their mentoring practice (F<sub>1,72</sub> = 79.194, p<0.05). The null hypothesis is rejected. The table shows that there was significant positive multiple correlation between the predictor variable (lecturers' attitude) and mentoring practice (R=0.724, p<0.05). This implies that the predictor variable is a factor that can exert influence on mentoring practice. The coefficient of determination (R<sup>2</sup>=0.524) indicates that the predictor variable accounted for 52.4% of the total variance in mentoring practice while the remaining 47.6% unexplained variance is largely due to other variables outside the regression model that can account

for mentoring practice. The calculated F-ratio (79.194) is significant at 0.05 level of significance. This implies that the predictor variable provides a significant explanation for the variation in the mentoring practice.

The multiple relationships between the dependent and independent variables can therefore be given as follow:

$$Y = 1.000 + 0.781X$$

Where

Y = Mentoring practice

X = Lecturers' attitude

bi = (i=1) Regression Weight Coefficient

a=Constant (other variables other than X)

**Hypothesis 2:** There is no significant influence of mentoring on undergraduates learning outcome.

**Table 4: Regression analysis showing the influence of mentoring on undergraduates' learning outcomes.**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta (β)		
(Constant)	26.968	7.637		3.531	.001
Mentoring practice	.977	.135	.650	7.255	.000
Multiple R =0.650 Multiple R <sup>2</sup> = 0.422 Adjusted R <sup>2</sup> = 0.414 F <sub>1,72</sub> = 52.635 p = 0.000					

\***p<0.05**

Table 4 shows that there is significant influence of mentoring on undergraduates' learning outcomes (F<sub>1,72</sub> = 52.635, p<0.05). The null hypothesis is rejected. The table shows that there is significant positive multiple correlation between the predictor variable (mentoring) and undergraduates' learning outcomes (R=0.650, p<0.05). This implies that the predictor variable is a factor that can exert influence on undergraduates' learning outcomes. The coefficient of determination (R<sup>2</sup>=0.422) indicates that the predictor variable accounted for 42.2% of the total variance in undergraduates' learning outcomes while the remaining 57.8% unexplained variance is largely due to other variables outside the regression model that can account for undergraduates' learning outcomes. The calculated F-ratio (52.635) is significant at 0.05 level of significance. This implies that the predictor variable provides a significant explanation for the variation in the undergraduates' learning outcomes.

The multiple relationships between the dependent and independent variables can therefore be given as follow:

$$Y = 26.968 + 0.977X$$

Where

Y = Undergraduates' learning outcomes

X = Mentoring

bi = (i=1) Regression Weight Coefficient

a = Constant (other variables other than X)

## Discussion

From the results of this study, it was discovered that Science Lecturers have the basic knowledge of mentoring. This is in line with Olu-Ajayi (2017) who believed that Lecturers are to mentor and not just serve their obligatory lecturing roles. This agrees with the study of Chow et al. (2004 & Simpson et al. 2007) who believed that taking on a new mentoring role can act as professional development to advance the Mentor Teacher's knowledge and understanding of the profession. Also

learning these mentoring skills according to Upson, Koballa, & Gerber (2002) can be used to advance teaching practices.

A significant multiple correlations were discovered between attitude of Lecturer and mentoring practice. Attitude can go a long way to influence practice. Also, mentoring and undergraduates learning outcome are discovered to be significantly correlated. This is in agreement with Rhodes et al (2000) who believe that positive perceptions of Teacher-Student relationships are consistently associated with increases in motivation, academic competence and achievements, School engagements, School value, and behavioural adjustment.

### Conclusion

Based on the results of this study, it was concluded that mentoring is a practicable tool in curbing drop-out problem and improving learning outcomes among Science undergraduates. Lecturers that mentor their undergraduate students provide them with opportunities of better achievements and positive attitudes. Lecturers that Mentors are efficient in their duties, closer to students and able to advice and counsel them appropriately, this improve their learning outcomes.

### Recommendation

Based on the results of the study, the following recommendations are made.

1. Lecturers should willingly mentor Science undergraduates
2. Undergraduates should submit themselves to mentoring by their Lecturers.
3. Lecturers should be encouraged to attend professional Workshops, Seminars, trainings and Conferences to build their levels of mentoring expertise.

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