xIlkogretim Online - Elementary Education Online,2021; Vol 20 (Issue 1): pp. 3487-3492
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.01.393

# UNDERGRADUATES MENTORING IN SCIENCE EDUCATION: THE LEVEL COORDINATOR'S APPROACH

**Olu-Ajayi,** Department of Science Education, Faculty of Education, Ekiti State University, Ado-Ekiti.
**Funmilayo Elizabeth,** Department of Science Education, Faculty of Education, Ekiti State University, Ado-Ekiti.

**Abstract-** The Study investigates the influence of a level Coordinator on Science Undergraduates' attitude towards learning. It identified the many factors contributing to the success and failures of Undergraduates in University system to include student's social capital. Adescriptive research of survey method of which the population consists of Science Undergraduates of Ekiti State UniversityAdo-Ekiti Nigeria. The sample was selected usingpurposive and total sampling techniques. The instrument was a questionnaire used to obtain information on Undergraduates' attitude towards learning.The face and content validity of the instrument was ensured by Science Educationists and Education Psychologists. Reliability of the instrument was done through test-retest and a coefficient value of 0.82 was obtained through Pearson Product Moment Correlation.Theresults which wereobtained through Regression analysis indicated remarkable influences of Mentoring on the Undergraduates. It was concluded that Mentoring by the Level Coordinator positively influenced the attitudes of Science Education Undergraduates' towards learning. The study thus recommends the use of Mentoring in Universities and other tertiary Institutions of learning in promoting students attitudes towards learning.

**Keywords: Undergraduates, Mentoring, Science Education, Level coordinator**

## I. INTRODUCTION

Mentoring is a mutual and result aimed relationship involving a more experienced person, refer to as Mentor and a less - experienced, a Mentee. Mentoring relationship can be experienced in various ways and situations; in school, workplace, on jobs, religious settings to mention a few.There are variances in the definitions ofMentoring (DuBois&Karcher, 2005;DuBois et al., 2011); MENTOR/National Mentoring Partnership, 2009) butit all have commonfeatures. The main feature in Mentoring is it's being a relationship between a provider (Mentor) and a recipient (Mentee) for the potential of benefit for the Mentee and usually aone-on-one engagement. Other features noted in various definitional statements as stated byTolan, McDaniel, Richardson, Arkin, Augenstern, DuBois (2020)include; interaction between the Mentor and Mentee over an extended period of time, inequality of experience, knowledge, or power between the Mentor and Mentee, with the Mentee possessing the lesser portion, the Mentee is in a position to gain from the knowledge, skill, ability, or experience of the Mentor, absence of the specific role inequality between giver and recipient that typifies many other interventions relationships, indicating that the adult is in authority over the child in need of teaching or specific help and is utilizing specific skills to do so. These features are noted as what differentiates Mentoring from professional–client relationships, parenting, informal adult aid, or formal Educational relationships (DuBois&Karcher, 2014; Rhodes, 2002). Thereasons for any mentoring relationship are to improve, develop, and better the lot of the mentee. Mentors might focus on self-esteem, social and behavioral skills and achievement motivation. Youth Mentoring is one of the most popular and widely implemented approaches to promote success of youth and to reduce risk for substance use, school failure, delinquency, and other problems (Garringer, McQuillin, & McDaniel, 2017).

Students are naturally curious, which makes Science an ideal subject for them to learn.Science allows students to explore their world and discover new things. It is also an active subject containing activities such as hands-on laboratories and experiments. This makes Science well suited to active young children. Science is the study of phenomena and events around us throughsystematic observation and experimentation.Science Education is an important part of Science strategy and accounts for the greatest proportion of the executives 'total Science expenditure. A key aim of the strategy is to ensure that enough people study Science to a standard which will meet the future needs of the Country (Kind & Taber 2005).Science Education is based on authentic problem–based teaching and learning activities that may not primarily focused on producing the expected results. Science Education is well recognized as a distinct field within Education and is concerned with the teaching and learning of Science and the discrete Science

Disciplines, Nested within Science Education are sub-fields such as Physics Education, Chemistry Education, Biology Education, Computer Education, Mathematics Education and Basic science Education (Keith, 2014). The emphasis of Science Education is to enhance students' scientific literacy through activities that involves studying the environments, manipulation of limbs and experiments. Exemplary Science Education can offer a rich context for developing many 21 Century skills such as critical thinking, problem solving and information literacy especially when instruction addresses the nature of Science and promote use of Science practices. Ideally, teaching the Scientific methods to students as stated byacademic partnerships/UTA(2017) is teaching them how to think, learn, solve problems and make informed decisions. These skills are integral to every aspect of a student's Educational life from school to Career with a degree in Science Education, teachers can use what they learn about science instruction techniques and curriculum designs to advance Science Education and students' learning.

In Tertiary Institutions, Mentoring relationships could usually be between Instructors, Lecturers, Professionals and their more experienced colleagues; between Instructors, project Supervisors and students,and between the Level Coordinators and the students.It has been recorded that positive relationships with teachers are imperative to providing needed "social capital" for students (Croninger& Lee, 2001). Cases of students dropping out of school before graduation and feeling disconnected from the school environment often result from the lack of this 'social capital'. Furthermore, students who dropped out cited lack of support and interest from school Personnel as one of the reasons for leaving school (Croninger&Lee, 2001). Dynarski, Clarke, Cobb, Finn, Rumberger, &Smink, (2008) recorded that recent publication from the U.S. Department of Education recommends that schools assign an adult advocate as an intervention for students at risk of dropout. Reasonably, some school systems are beginning to utilize interventions that rely on the power of positive teacher–student relationships; The Check in/Check out (CICO) program according to Filter et al., (2007) is a behavioral intervention designed to increase adult feedback and attention to positively impact student behavior. It involves students' compulsory meeting with a school staff member for behavior status monitoring at the start and end of each day, the Good Friend program in Illinois was designed for increased positive relationships among teachers and students (DuFour, DuFour, Eaker&Karhenek, 2004) each staff member isobligatory made to pay special attention to a student, who is identified as at-risk for drop-out or failure. These programs strengthened adult-student relationships and could be identified as forms of Mentoring interventions. And the work of the Mentor here is to develop his/her Mentee in the three domains of Education (cognitive, affective and psychomotor).Learning at all levels requires a mentoring relationship between Instructor and students (Burrows 2011). Schneider's (2008) suggests that to be effective, Mentoring must include the cooperation of Educational Institutions. In tertiary Institutions,and particularly, Ekiti State University, Ado-Ekiti, Nigeria which is this study location, a Level Coordinator, usually a Lecturer is usually assigned to specific academic sessions by the Departments to coordinate the students and provide an overall assistance towards commendable learning outcomes. This is an official nomination saddled with the responsibilities of collating student's results, relating with students via their class representatives, acting as intermediary between students and Department, teaching the students and seeing to the total academic welfare of the students assigned to him/herhence, in a position to willingly mentor the students. Tiffany (2016) with reference to Schneider (2008) explained 4 goals to build a successful Mentoring relationship as: (1) Mentors should focus candidates' attention to specific features of teaching and share ideas about best practice facilitate growth in student learning, (2) Mentors can take an active role in guiding candidates' thinking as they plan lessons, practice teaching and reflect on their experiences. Mentors can structure planning and teaching tasks based on their candidate's learning needs and provide feedback that will encourage reflective thinking, (3) as partners in teacher Education, Mentors can complement and support the work of University Faculty. Mentors can communicate with college Faculty to refine tasks for candidates, assess candidate learning, and evaluate candidate progress, (4) as Professionals, Mentors can continue to refine their understanding of learning and teaching. Here, the Level Coordinator as a Mentor, endeavor to know their students' academic strengths and weaknesses through pedagogical content knowledge (Kriner 2004). Students as Mentees here are requested to trust their Level Coordinators to guide them through their challenges, even when unaware of these challenges. Mentoring relationship develops with both sides providing feedback to the other as they work towards the mutual goal of student success (Burrows 2011).Raposa, BenEliyahu, Olsho, & Rhodes(2019) noted that attempts in understanding what influences success of Mentoring have recently been focused on relationship between the Mentor and Mentee, thus in tertiary Institutions setting, there should be a particularly positive bonding between the Level Coordinator and the student involved.

Successes have been recorded in the use of Mentoringin academics; Mentors help students develop the skills and attitudes that are essential to academic success. Mentors encourage good attendance and also

serve as advocates when students have problems or concerns. When a student encounters social or academic difficulty in school, the availability and help of a supportive school figure can be critical in determining their success or failure (Alter, 2007).
Academic Mentors can be a real asset in "differentiating" the curriculum for Science students with different needs and interests,equally successful with underachieving students and those with a particular interest they want to explore in greater depth (http://www.principalspartnership.com/) While the focus is primarily academic, Mentors also work with students to develop better self-esteem and achievement motivation.

**Problem of the Study**
The excitement of gaining admission into the University coupled with the stressof habituating to the University system and environment, peer influence and under-age has lots of impacts on the Undergraduates of Science Education and may adversely affect their attitude towards learning.

**Purpose of Study**
The Study aimed at appraising the work of a Level Coordinator in the University system in mentoring the Science Undergraduates towards positive attitude tolearning. This Study intendsto do this by highlighting the obligatory roles of a Level Coordinator, and measuring the relationship between him/her and his/her students in a Mentoring relationship withregards to students' learning outcomes.

**Research Questions**
The Study is guided by the following questions:
i. Is there anyneed for a Level Coordinator in the University system?
ii. Does Mentoring have any effect on Undergraduates attitudes?
iii. What are the effects of Mentoring on Science Undergraduates Performance?

**Research Hypotheses**
i. There is no significant impact of Mentoring on Science Undergraduates'attitude towards learning.
ii. There is no significant influence of a Level Coordinator on Science Undergraduates learning attitude.

## II. METHODOLOGY

The study employed descriptive survey method, and the sample was made up of the 135Science Education Undergraduates of 2016/17 Session admission inEkiti State University, Ado-Ekiti. Purposive and total sampling techniques was used to select the sample. And the instrument used was a questionnaireto measure the attitude towards learning. A monthly visitation register to the Level Coordinator, and students' cumulative grade per annum was used to compare with students' attitude towards learning which is believed will automatically affect their learning outcomes. The face, content and constructvalidity of the instrument used was ensured by specialists in Science Education and Education Psychology.Reliability was ascertained using test-retest method. The value 0.82 was realized through Pearson Product Moment Correlation statistics and was adjudged high enough for the instrument to be reliable. The instrument was administered to the sample and the data collected was compared with students' visitation to their Level Coordinator and progress in performance via Cumulative Grade Point (CGP). Regression statistics was used to analyze the data for the study.

## III. RESULTS

**Hypothesis 1**
There is no significant impact of Mentoring on Science Undergraduates attitude towards learning.

**Table 1:** Regression analysis showing the impact of Mentoring on Undergraduates' attitude towards learning Science

| | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|
| **Model** | **B** | **Std. Error** | **Beta(β)** | **T** | **Sig.** |
| (Constant) | 4.284 | .611 | | 7.012 | .000 |
| Mentoring | .668 | .042 | .749 | 15.895 | .000 |

Multiple R=0.749, Multiple $R^2$= 0.561, Adjusted $R^2$=0.558, $F_{1,198}$=252.653*

***p<0.05**

Table 1 shows that there is a significant impact of Mentoring on Undergraduates' attitude towards learning Science ($F_{1,198}$=252.653, p<0.05). The null hypothesis is rejected. The table reveals that there is significant positive multiple correlation between the predictor variable (Mentoring) and learning attitude of Science Education Undergraduates (r=0.749, p<0.05). This implies that the predictor variable is factor that can exert influence on learning attitude thereby affecting the performance of Undergraduates in Science Education. The value of the coefficient of determination ($R^2$=0.561) indicates that the predictor variable accounted for 56.1% ($R^2$ X 100) of the observed variance in the learning attitudes of Undergraduates while the remaining 43.9% unexplained variance is largely due other variables that can account for the performance of Undergraduates in school. The calculated F-ratio (252.653) is significant at 5%. This implies that the predictor variable provides a significant explanation for the variation in the learning outcomes of Science Undergraduates in the Faculty of Education.

**Hypothesis 2**

There is no significant influence of Level Coordinators on the attitudes of Science Education Undergraduates.

**Table 2:** Regression analysis showing the influence of Level Coordinators on the attitudes of Science Education Undergraduates.

| | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|
| **Model** | **B** | **Std. Error** | **Beta(β)** | **T** | **Sig.** |
| (Constant) | 5.094 | .432 | | 11.800 | .000 |
| level coordinating | .314 | .030 | .601 | 10.574 | .000 |

Multiple R=0.601, Multiple $R^2$= 0.361, Adjusted $R^2$=0.358, $F_{1,198}$=111.801*

***p<0.05**

Table 2 shows that there is significant influence of level coordinatorson science undergraduates' attitude ($F_{1,198}$=111.801, p<0.05). The null hypothesis is rejected. The table reveals that there is significant positive multiple correlation between the predictor variable(coordinating students) and Undergraduates' attitude towards learning (r=0.601, p<0.05). This implies that the predictor variable is factor that can exert influence on Undergraduates attitude towards learning. The value of the coefficient of determination ($R^2$=0.361) indicates that the predictor variable accounted for 36.1% ($R^2$ X 100) of the observed variance in Science Undergraduates' attitude while the remaining 63.9% unexplained variance is largely due other variables that can account for Undergraduates' attitude to learning. The calculated F-ratio (111.801) is significant at 5%. This implies that the predictor variable (Level coordination) provides a significant explanation for the variation in the Science Education Undergraduates' attitude towards learning.

## IV. DISCUSSIONS

The study recorded a significant impact of Mentoring on Undergraduates' attitude towards learning Science. This is in line with the findings of researchers;Rhodes, Jean& Nancy (2000) Olu-Ajayi (2016) Jegede&Olu-Ajayi, (2018)who proved mentoring as a reliable tool of improving learning in students. Though there are other variables accounting for learning, but Mentoring has been recorded to be efficient

in developmental training of 'at risk' students, which involves; low-achievement students, physically challenged, psychologically disturbed students, slow students among others. Various approaches have been used to harness academic Mentoring, the ' Level Coordinators' approach' (LCA) used in this study has enabled thorough interaction between the Mentor and Mentee in the University Community and helped to improve Science undergraduates' attitude, performance and interest; build confidence in introvert students, avoid minute mistakes that alter students grades and learning outcomes, provide timely interventions to psychological and academic problems that may result to a Science Undergraduate having references of extra years or semesters

## V. Conclusion

The study concludes that 'the level coordinator approach' is a good means to Mentoring Science Undergraduates. This will help in proper coordination and ensure that every Undergraduate is noted and cared for. The Level Coordinator keep progress record of each Undergraduate assigned as he/she Mentors through the year. This Mentoring relationship will reduce the Lecturer/Student barrier and encourage freedom of expression and confidentiality as student discusses with the Level Coordinator. This is believed to effect attitude enhancement, academic progress and general learning outcome in Science Education Undergraduates.

## VI. Recommendations

The study made the following recommendations;

i. Academics mentoring should be encouraged in every level of Education.
ii. Mentoring should be employed by Science Educators to encourage positive attitudes towards Science learning in students.
iii. 'Mentoring' should be a notable part in teachers curriculum
iv. Level Coordinators in Tertiary institutions should be encouraged to mentor the students assigned to them.
v. Science Educators should willingly Mentor their students

## References


1. Alter, P. S. (2007). The positive alternative learning supports program: Collaborating to improve student success. *Teaching Exceptional Children,* 40(2), 38-46.
2. AP/UTA (2017).Importance of Science Education in Schools.University of Texas at Arlington Academic Partnership. Academicpartnerships.uta.edu
3. Croninger, R. G., & Lee, V. E. (2001). Social capital and dropping out of high school: Benefits to at-risk students of teachers' support and guidance. *Teachers College Record*, 103(4), 548-581.
4. DuBois, D. L., &Karcher, J. J. (2005). Youth mentoring: Theory, research, and practice. In D. L. DuBois& M. J. Karcher (Eds.), Handbook of youth mentoring (2–12). Thousand Oaks, CA: Sage.
5. DuBois, D. L., &Karcher, M. J. (Eds.), (2014). Handbook of youth mentoring (2nd ed.). Thousand Oaks, CA: Sage.
6. DuBois, D. L., Portillo, N., Rhodes, J. E., Silverthorn, N., & Valentine, J. C. (2011). How effective are mentoring programs for youth? A systematic assessment of the evidence.*Psychological Science in the Public Interest*, 12(2), 57–91.
7. DuFour, R., DuFour, R. Eaker, R. &Karhanek, G. (2004). Whatever It Takes: How Professional Communities Respond When Kids Don't Learn. Bloomington, IN: National Education Service.
8. Dynarski, M., Clarke, L., Cobb, B., Finn, J., Rumberger, R., &Smink, J. (2008). Dropout Prevention: A Practical Guide (NCEE 2008-4025). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved October 4, 2008 from, http://ies.ed.gove/ncee/wwc.
9. Filter, K. J., McKenna, M. K., Benedict, E. A., Horner, R. H., Todd, A. W., & Watson, J. (2007). Check in/ Check out: A post-hoc evaluation of an efficient, secondarylevel targeted intervention for reducing problem behaviors in schools. *Education and Treatment of Children* 30(1), 69-84.
10. Garringer, M., McQuillin, S., & McDaniel, H. (2017).Examining youth mentoring services across America.Mentor: The National Mentoring Partnership.Findings from the 2016 national mentoring program survey. Boston, MA:

11. Keith, S, (2014). Students thinking and learning in Science perspectives on the nature and development of learners ideas New York: Routledge.
12. Kind, V. & Taber, K. (2005).Science:Teaching School subjects 11-19. London. Routledge.
13. MENTOR/National Mentoring Partnership. (2009). Elements of effective practice for mentoring (3rd ed.). Alexandria, VA: Author. Retrieved from http://www.eric.ed.gov/PDFS/ED512172.pdf
14. Raposa, E. B., Ben-Eliyahu, A., Olsho, L. E., & Rhodes, J. (2019). Birds of a feather: Is matching based on shared interests andcharacteristics associated with longer youth mentoring relationships? *Journal of Community Psychology*, 34,1–13.
15. Rhodes, J.E, Jean B. & Nancy L (2000) "Agents of change: Pathways through which mentoring relationships influence adolescents' academic adjustment." *Child Development*, 71, 6
16. Rhodes, J. E. (2002). Stand by me: The risks and rewards of mentoring today's youth. Cambridge, MA: Harvard University Press.
17. Schneider, R. (2008). Mentoring New Mentors: Learning to Mentor Preservice Science Teachers.*Journal of Science Teacher Education.* 113-116. doi:10.1007/s10972-007-9088-x.
18. Schworth, A.; Burrows, A.; &Guffey, S. (2016).Mentoring Partnerships in Science Education.arXiv:1610.04808Vi [Physics.ed-ph]
19. Tiffany, T. B. (2016). Fostering a Culture of Collaboration during International Pre-school Teacher field placement: The power of Mentor Teachers. *European Scientific Journal* (ESJ) Special Edition.ISSN-4857-7881 e-ISSN1857-7431.67-77.
20. Tolan, P., McDaniel, H., Richardson, M., Arkin, N., Augenstern J., &DuBois D. (2020). Improving understanding of how mentoring works: Measuring multiple intervention processes. *Journal of Community Psychology*.1–22. https://doi.org/10.1002/jcop.22408