

Enhancing University Science Students Employability Skills through the Use Cooperative Learning Instructional Strategy

Abubakar Ayuba Sunday

Department of Science Education

Sule Lamido University, P.M.B 043 Kafin Hausa, Jigawa State

Email: sundayabu@gmail.com

ABSTRACT

In this fast growing and competitive economy, demand is so heavy on our institution of learning to turnout graduates with not only a good class of degree or high CGPA – but those with generic skills that can be applicable across different discipline. With population outburst coupled with the high unemployment rate, it is eminent that all stakeholders must collaborate in preparing our teaming youth for the workforce that characterizes the 21st century. Here cooperative learning instructional strategy was presented as a promising instructional strategy. The definition, features and benefits of cooperative learning was highlighted. The concept of employability was briefly presented. It was argued that cooperative learning environment can enhance the development of employability skills in our university students. Few recommendations were made.

Keywords: *Employability, Cooperative learning, Sule Lamido*

INTRODUCTION

In this fast growing and competitive economy, demand is so heavy on our institution of learning to turnout graduates with not only a good class of degree or high CGPA – but those with generic skills that can be applicable across different discipline. Employers grumble about schools not producing employable workers with the right sets of skills. In fact, education is perceived as losing the race with technology, unable to keep up with the soaring skills demand of 21st-century economies and the many social changes contemporary globalised societies bring about (CERI Conference Background Paper, 2014). With population outburst coupled with the high unemployment rate, it is eminent that all stakeholders must collaborate in preparing our teaming youth for the workforce that characterizes the 21st century. According to Abubakar (2016), we need to rethink our instructional strategies. It is becoming an acceptable practice now in our universities that, a lecturer must lecture. Johnson, Johnson and Smith (2013) lamented that, while agriculture, medicine, science, and transportation, as well as manufacturing and communication have all been transformed and improved, teaching relatively has not. The authors maintained that, same assumptions continue that teaching is telling, learning is absorbing what the instructor tells, and knowledge is subject matter content. However, it has been established by many researchers that lecture mode of instruction cannot develop in our learners the needed skills for the 21st century workforce. Slavin (2011), maintained that, lecture-based teaching has been reported to be less effective to the demands of high rates of cognitive and affective outcomes.

A more promising instructional technique is the cooperative learning instructional strategy (CLIS). Cooperative Learning Instructional Strategy is an instructional strategy where

students learn in small group to achieve a goal that is not easily achieved individually or competitively. According to Lam (2013), Cooperative learning is a student-centered, instructor-facilitated instructional strategy in which a small group of students is responsible for its own learning and the learning of all group members. Students interact with each other in the same group to acquire and practice the elements of a subject matter in order to solve a problem, complete a task or achieve a goal. Cooperative learning may be contrasted with competitive (students work against each other to achieve an academic goal such as a grade of "A" that only one or a few students can attain) and individualistic (students work by themselves to accomplish learning goals unrelated to those of the other students) learning (Johnson et al., 2013)

Cooperative learning instructional strategy is rooted in Vygotsky theory of social interaction. Lev Vygotsky, (1962), A Russian teacher and psychologist, first stated that we learn through our interactions and communications with others. He further examined how our social environments influence the learning process. He suggested that learning takes place through interactions students have with their peers, teachers and others. The major theme of Vygotsky's theoretical frame work is that social interaction plays a fundamental role in the development of cognition. Vygotsky (1978) maintained that every function in the child's cultural development appears twice: First, on the social level and later on the individual level, first between people (inter-psychological) and then inside the child (intra-psychological).

A principle that is cardinal in Vygotsky theory is the principle of More Knowledgeable One (MKO). He explained that the MKO refers to someone who has better understanding or highly ability level than the learner, with respect to a particular task, process or concept. He however, posited that, the MKO must not necessarily be a teacher or an older adult. He could be a student's peers with more knowledge or experience. It can be deduce therefore that, student interaction with group members in a cooperative learning group will undoubtedly leads to cognitive restructuring which leads to better learning. This method of instruction enhances not only academic skills but social skills.

FEATURES OF COOPERATIVE LEARNING

According to Johnson & Johnson (2009) not all groups are cooperative. The writers explained that, placing people in the same room, seating them together, telling them they are a group does not mean they will cooperate effectively. Therefore Johnson & Johnson (2005) observed that, to be cooperative, to reach the full potential of the group, five essential elements need to be carefully structured in to the situation. These are:

(i) Positive interdependence

The first and most importance element is positive interdependence. Teachers must give a clear task and group goal so students believe they sink or swim together (Johnson & Johnson, 1994). The authors explained that positive interdependence exists when group members perceive that they are linked with each other in a way that one cannot succeed unless every one succeeds. If one fails, all fail. Felder and Brent (2007) opined that, if any team member fail to do their part, every one suffers consequences. Group members realize,

therefore, that each person's effort benefit not only him or herself, but all other group members as well. Positive interdependence create commitment to other peoples' success as well as one's own and is the heart of CLIS. If there is no positive interdependence, there is no cooperation (Johnson & Johnson, 1994). Dyson & Grineski (2001), & Krol, Janssen, Veenman, & Linden (2004), in agreement with Johnson & Johnson, stated that positive interdependence occurred when each group members learned to depend on the rest of the group to achieve shared task.

(ii) Individual and group accountability

Individual and group accountability is the second important element of cooperative learning. According to Johnson and Johnson (2005), the group must be accountable for achieving its goals. Each member must be accountable for contributing his or her share of work (which ensure that no one "hitch-hikes" on the work of others). The group has to be clear about its goals and be able to measure: (a) its progress in achieving them and (b) the individual efforts of each its members. Individual accountability exist when the performance of each individual student is assessed and the results are given back to the group and the individual in order to ascertain who need more assistance, support, and encouragement in completing the assignment. Millis (2002) suggested that each individual member of the group must be individually responsible for their own academic performance.

(iii) Promotive interaction

The third essential component of cooperative learning is promotive interaction, preferably face to face interaction. Promotive interaction occur when member share resources, help, and support, encourage, and praise each other's effort to learn (Johnson 2003). Hence, cooperative learning groups are both academic support system (every student has someone who is committed to helping him or her learn) and a personal support system (every student has someone who is committed to him or her as a person). There are important cognitive activities and inter personal dynamics that can only occur when students promote each other's learning. This include orally explaining how to solve problems, discussing the nature of the concept being learned, teaching one's knowledge to classmates, and connecting present with past learning. It is through promoting each other's learning face to face that members become personally committed to each other as well as to their mutual goals (Johnson 2003).

(iv) Interpersonal and group skills

The fourth essential element of cooperative learning is teaching students the required interpersonal and small group skills (Johnson & Johnson, 1994). According to Neo, Kwok, Lai & Zarina (2012), many students do not usually work in a cooperative learning environment, they may lack group and social skills. These social skills are not necessarily inherent, but can be taught and learn. In cooperative learning groups students are required to learn academic subject matter (task work) and also to learn the interpersonal and small group skills required to functions part of a group (team work). Tanner et-al. (2011), believed that explicitly addressing this as part of science education would better prepare scientists, engineers, and health care professionals for the complex social dynamics of laboratories and clinics. Group members must know how to provide effective leadership, decision-making, trust-building, communication and conflict-management, critical thinking and be motivated

to use prerequisite skills. Teachers have to teach team work skills just as purposefully and precisely as teachers do academic skills. Science cooperation and conflict are inherently related, the procedure and skills for managing conflicts constructively are especially important for the long-term success of learning groups (Johnson & Johnson, 2009)

(v) Group processing

Group processing is the fifth essential component of cooperative learning (Johnson 2003). Group processing exists when group members discuss how well they are achieving their goals and maintaining effective working relationships. Students must have opportunity to discuss how the work in the group is going, what has been successful, and what could be improved (Tanner et al., 2011). Thus, these five elements are essential to all cooperative systems, no matter what their size. When a national goal is set on education, finance, health, agriculture, transport, environment defense or any section of the government all stakeholders can work cooperatively as team to achieve these goals – hence the need to start from the classroom (Abubakar 2015).

Cooperative Learning and Science Learning

Many researchers have revealed the benefit of cooperative learning instructional strategy in promoting both cognitive and social gains among higher education science students. Johnson, Johnson & Stanne (2000) argued that, when cooperative learning is compared with conventional mode of instruction, the consistency of the results and the diversity of the cooperative learning methods provide strong validation for its effectiveness. Gökhan (2011) in a study using 50 university students who were enrolled in two classes of the general gymnastics course, reported that usage of cooperative learning during gymnastics classes has a stronger link with students' academic success, lesson attitude and practicing skills. Jansoon, Somsook & Coll (2008), reported the learning experiences of 244 Thai first year undergraduate chemistry students in a cooperative learning setting. They reported that, in contrast with the traditional conventional mode of instruction, the students enjoyed the more interactive nature of the cooperative learning setting. The authors reported that the cooperative model offered the students opportunity to stand as expert before other students which enhanced their self-confidence about chemistry learning in practical classes. Lord (2001) in his on contribution outlined the following as benefits of cooperative learning, they include

- Cooperative Learning Enhances Thinking and Learning in Science
- Cooperative Learning Enhances the Learning Environment in Science
- Cooperative Learning Enhances Science Reading and Writing
- Cooperative Learning in Science Enhances Social Skills
- Cooperative Learning Enhances Science Instruction
- Cooperative Learning Enhances the Attitudes of Science Students
- Cooperative Learning in Science Enhances Student Values
- Cooperative Learning in Science Models Real Life
- Cooperative Learning Enhances Science Learning

According to Tanner et al (2011), to improve science teaching and learning, science educator's teaching tools need to address two major criteria namely: (a) teaching practice should mirror

current understanding of learning process, and (b) science teaching should reflect scientific practice. Effective Science is collaborative and social in nature. Tanner et al lamented that our students often do not have the opportunity to work collaboratively until they find themselves in graduate laboratories. This ought not to be the case. Scientist physicians, engineers naturally work as teams. Students can learn to work together in group in classrooms that reflect the complexity and diversity of the world.

Concept of employability

Graduate employers across all industries want more than just a degree; they want graduates who can demonstrate a wide range of other skills, attributes and knowledge, often called employability skills. Many definitions and models of employability have been presented in the literatures. According to Dearing (1997) employability is linked to the acquisition of skills for life. The author recommended that higher education focus on key skills which were the key to the future success of graduates whatever they intend to do in later life. Skills identified included: communication skills, numeracy, information technology, learning how to learn/personal development planning, problem solving and team working. Hillage & Pollard (1998) described employability as the capability to move self-sufficiently within the labour market to realise potential through sustainable employment.

Bowden et al (2000) emphasised that employability should not just be concerned with preparing graduates to be successful in the labour market but also about preparing them to contribute to society as a citizen. They defined employability as a set of graduate attributes; the qualities, skills and understandings a university community agrees its students would desirably develop during their time at the institution and, consequently, shape the contribution they are able to make to their profession and as a citizen. The Confederation of British Industry (CBI) has defined employability as the possession by an individual of the qualities and competencies required to meet the changing needs of employers and customers and thereby help to realize his or her aspirations and potential in work (CBI, 1999). Knight and Yorke (2003) see it as a set of achievements - skills, understandings and personal attributes - that make individuals more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy. They suggested that there is a close relationship between employability and good learning. Pool & Sewell (2007), present a more accessible model, the Career EDGE model of Graduate Employability. EDGE provides a useful summary of five essential elements that aid students' employability. These include:

- Career Development learning
- Experience (work & life)
- Degree subject knowledge, understanding and skills
- Generic skills

- Emotional intelligence, the capacity for recognising our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships.

Cole and Tibby (2012), summarise employability as follows:

- It is a lifelong process.
- It applies to all students whatever their situation, course or mode of study.
- It is complex and involves a number of areas that interlink.
- It is about supporting students to develop a range of knowledge, skills, behaviours, attributes and attitudes which will enable them to be successful not just in employment but in life.
- It is a university-wide responsibility.
- It is about making the components of employability explicit to students to support their lifelong learning.

Cooperative learning and Employability

Employability is a university- wide responsibility (Cole and Tibby, 2012); considering the social function of a university in fostering the intellectual and social development of the society, it is here argued that, cooperative learning environment carefully put in our lecture room can provide the opportunity for students to gain experiences, generic skills and emotional skills that will make them employable. It is important to note that, in cooperative learning, learning is emphasized more than teaching. Positive attitude can be enhanced during cooperative learning. Students bring with them their own negative attitudes and prejudices. Population diversity is becoming more the norm than the exception in many places. When there is a mix of learners in the same class, cooperative Learning environment has the potential to diminish negative attitudes and to develop positive ones depending how interaction is structured (Lam, 2013). Hillage and Pollard (1998) described attitude as a component part of employability asset.

As outlined above, personal and social skills can be developed in a cooperative learning environment. Teachers usually neglect the importance of developing students' personal and social skills. According to Lam (2013), family life is now changing and students do not develop these skills at home. Therefore, it is the responsibility of teachers to help develop their generic skills. The author opined that through the use of cooperative learning, generic skills like collaboration skills, communication skills and study skills can be greatly developed. Lam's position supported the report of the employability skill profile (1992). According to the profile, employers are looking for graduates who can communicate and work with other people. Cuseo (1992) suggested that, explicit instruction on effective skills for communicating and relating to others should be given to students prior to, and in preparation for their involvement in a cooperative-group learning activities. He posited that such instruction may include strategies for encouraging and supporting other group members, active listening, constructive disagreement, conflict resolution, and consensus building. Thus, students receive some preparation and guidance for handling the social and emotional demands of small-group work, rather than being left entirely to their own devices (Cuseo, 1992).

Another skill that can be developed in a cooperative learning environment is conflict resolution. Conflict resulting from divergent views if properly regulated can lead to cognitive gain. Cooperative learning is supposed to produce an environment in which epistemic conflict regulation should take place, with confrontation leading to a better understanding of the problem, deep processing of information, re-conceptualization and integration (Buch and Butera, 2015).

Therefore a well-structured cooperative learning environment can offer our students a platform to learn empathy, conflict resolution, time management, stress management, listening skills, teamwork, problem solving and application of technologies.

CONCLUSION

Demand is so heavy on our institution of learning to turnout graduates with not only a good class of degree or high CGPA – but those with generic skills that can be applicable across different discipline. In other word, graduates who can demonstrate a wide range of other skills, attributes and knowledge, often called employability skills. The author strongly believe that engaging students in a cooperative learning can help develop in our student cognitive, social and emotional skills needed to remain employable irrespective of the changing demands of employers and the economy. A good quantitative research however, can be design to investigate the contribution of cooperative learning in developing employable skills in university students.

RECOMMENDATION

The following recommendations are made, they include,

- Workshops and seminars should be organize to train faculty staff on the use of different cooperative learning models
- The concept of Employability should be emphasized in the curriculum at different level of education.

REFERENCES

- Abubakar, A.S (2015). Rethinking cooperative learning instructional strategy for national Development. A paper presented at faculty of education conference, Usman
- Bowden, J., Hart, G., King, B., Trigwell, K. and Watts, O. (2000) *Generic capabilities of ATN university graduates*. Available from: <http://www.clt.uts.edu.au/ATN.grad.cap.project.index.html> (15 February 2013).
- Buch, C and Butera, F(2015). Cooperative learning and social skills development. Retrieved from https://www.researchgate.net/publication/272197928_Cooperative_learning_and_social_skills_development
- CBI (CONFEDERATION OF BRITISH INDUSTRY) (1999). *Making Employability Work: An Agenda for Action*. London: CBI.
- CBI/NUS (2011) *Working towards your future: making the most of your time in higher education*. CBI: London. Available from: <http://educationandskills.cbi.org.uk/reports/> (15 February 2013).

- Cerna-lucie , L(2014). Innovation, Governance And Reform In Education CERl Conference Background Paper(2014). Retrieved from:<http://www.oecd.org/cei/CERl/%20Conference%20Background%20formatt>
- Cole , D &Tibby, M (2012).Defining and Developing your Approach to Employability. Retrieved from:https://www.heacademy.ac.uk/system/files/4-8-employability_framework
- Dacre Pool, L. & Sewell, P. (2007) The key to employability: developing a practical model for graduate employability. *Education & Training*.49 (4), 277-289.
- Dearing, R. (1997) *Higher Education in the Learning Society*. Report of the National Committee of Enquiry into Higher Education. London: HMSO.
- Employability Skill Profile (1992). Retrieved from:www.ericdigest.org/1997-2/skills.htm , Danfodio university Sokoto, Nigeria, December, 2015.
- Gökhan B.(2011)The effect of cooperative learning on students' approach to general gymnastics course and academic achievements. *Educational Research and Reviews*, 6(1), pp. 62-71. Retrieved from:<http://www.academicjournals.org/ERR>
- Hillage, J. and Pollard, E. (1998) *Employability: developing a framework for policy analysis*. Research Brief No. 85. London: Department for Education and Employment.
- Hinchcliffe, G. and Jolly, A. (2011). Graduate identity and employability. *British Educational Research Journal*.37 (4), 563-584.
- Johnson, D. W. Johnson, R. T. and Smith, K (2013)Cooperative Learning: Improving University Instruction by Basing Practice On Validated Theory. *Journal on Excellence in University Teaching*.
- Janson,N,Somsook,E&Coll, R.K (2008).Thai Undergraduate Chemistry Practical Learning Experiences Using the Jigsaw IV Method. *Journal of Science and Mathematics Education in Southeast Asia*Vol. 31 No 2, 178-200
- Johnson,D,W,Johnson,R.T&Stanne, M.B(2000).Cooperative Learning Methods:A Meta-Analysis. Retrieved from:<https://www.researchgate.net/publication/220040324>
- Johnson D.W.,& Johnson R.T. (1999). Social skills for successful group work. *Educational leadership*, 47(4), 29-33.
- Johnson, D. W., & Johnson, R. (2005).Essential components of peace education. *Theory Into Practice*, 44(4), 280-292.
- Johnson, R. T., &Johnson, D. W. (2009). An overview of cooperative learning. In J.Thousand, A. Villa and A. Nevin (Eds), *Creativity and Collaborative Learning* Baltimore, US: Brookes Press.
- Johnson, D.W. & Johnson R.(1999). Learning together and alone: cooperative, competitive, and individualistic learning (5th Ed.) Boston: Allyn& Bacon.
- Johnson R, & Johnson D. (2001).what is cooperative learning. The cooperative learning center, the university of Minnesota. <http://www.clcrc.com>(access:2007)
- Johnson, D.W. (2003). Social interdependence: The interrelationship among theory, research, and practice. *American psychologist*, 58(11), 931-945.
- Johnson, D.W. (2009). Reaching out: Interpersonal effectiveness and self actualization (10th Ed). Boston: Allyn& Bacon.
- Krol, K., J., Veenman, S., & Linden, J. (2004). Effect on cooperative learning program

- on the elaborations of students working in dyads. *Educational research and evaluation*, 10(3)
- Lam B. H (2013). What is cooperative learning? The Hong Kong Institute of Education. Retrieved from: www.ied.edu.hk/aiclass/
- McQuaid, R.W. & Lindsay, C. (2005). The concept of employability. *Urban Studies*. 42(2), 197-219.
- Mills, B.J. (2009). Becoming an effective teacher using cooperative learning. *Peer review*, 2(2), 17-21
- Neo, T, Neo, M, Kwok, W, Tan, Y and Lai and Zarina (2012). MICE 2.0: Designing Multimedia content to foster active learning in Malaysian classroom. *Australian Journal of educational technology* 28(5), 857-880
- Slavin, R. E. (2011). Instruction Based on Cooperative Learning. In R. E. Mayer & P. A. Alexander (Eds.), *Handbook of Research on Learning and Instruction* (pp. 344-360). New York: Taylor & Francis.
- Yorke, M. and Knight, P.T. (2006). Embedding employability into the curriculum. *Learning and Employability*. Series 1 No. 3. Higher Education Academy. Available from: http://www.heacademy.ac.uk/assets/York/documents/ourwork/employability/id460_embedding_employability_into_the_curriculum_338.pdf (15 February 2013)