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ENGINEERING AND DESIGN PEDAGOGY IN NIGERIA

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ABSTRACT: *Of recent there have been more changes in instructional systems formats, new theories and contending issues on the changing trends in classrooms dynamics. New informational values, goals and objectives which have led to diverse strategies and technologies of teaching and learning are numerous and varied. Some forces (internal and external must have prompted these measures out of sincere concern or out of the realities on ground. These forces have been very imposing, symbolic and unique. Unfortunately, most classroom teachers especially in developing countries like Nigeria are yet to prove their worth in terms of serious input into the use of new instructional media (strategies, materials and tools) in the classrooms. This is regrettable and should not be so. There have been several factors which include lack of training, inadequate financial and material resources, conservative traditions and inappropriate. Design and Engineering. Pedagogy draws heavily from several disciplines such as Economics, Political Science, Philosophy, Psychology and Sociology. Pedagogy can be seen as the theory and practice of existing educational policies and practices, establishments and systems, seeing the world from every side and angle based on exploration, entrapments and expectations. Design and Engineering Pedagogical practices in Nigeria have been shrouded with skepticism and very many unexplained questions some described as ridiculous and difficult, complex and inappropriate. Teaching is not always on what happens in the classrooms or solely on theoretical realms, but also on making the concepts and material relevant to the people, environment and the forces of nature.*

KEYWORDS: *Design Pedagogy, Engineering, Instrumental system Format, Nigeria*

INTRODUCTION

What is Pedagogy? What is the concept of Design and Engineering? These are too challenging but factual, figurative, moral and ethical principles that are good and important, relevant and appropriate to human life and society. They address processes and products; include honesty and liberty, love and statistics, art and history, respect for life and self-control. They influence values and behaviours, determine priorities and relationships, as well as the moral and physical guidance we give to each other, the society and physical environment.

Pedagogy according to Stasbeff (2010) is the study of observable policies, principles and practices of human instructional teaching behaviours in relation to curriculum concepts. Students learning skills and the environment. Sorensen (2008) defines it as teaching strategy using appropriate techniques and tools to implement curriculum directives. Onwudiwe (2007) defines it as a profession or theory and practice of teaching which could be student-centered or subject-centered in approach. Whatsoever form pedagogy takes, it simply boils down to the concept of teaching to impart information and knowledge, with capacity building as the ultimate achievement in performance.

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CONCEPT OF DESIGN AND ENGINEERING

The concept of Design and Engineering is a strategy in response to the development challenges of a people and their environments, both physical and social. Paradoxically most people, especially in developing countries like Nigeria, grossly underestimate the extent of the social, political, economic and physical challenges of their development. With relevant and appropriate Design and Engineering Pedagogical practice, the people will succeed in stabilizing the polity, consolidate institutional and governmental structures, make modest progress in social and economic spheres, lay solid foundations for sustainable costs and poverty reduction, employment generation, wealth creation and value orientation. A good pedagogical practice in Design and Engineering according to Lawal (2006) will mobilize and streamline resources to make a fundamental break with the technical and social failures of the past and bequeath a prosperous future even to generations to come. It will provide a "home grown" reform programmes and projects. A good Design and Engineering pedagogical practice, Udoma (2009) further stated, means embarking upon an intensive and extensive consultative and partnership processes involving major stakeholders in the Design and Engineering processes. It is this interaction (concern) based on the realities and structures already visible that will ensure progress (success) and its sustainability. Bad practice stifles periodic amendments.

DESIGN AND ENGINEERING PRACTICE

Design and Engineering Practice must be seen as living documents whose various aspects may be modified in the light of implementation experiences. The major thrust of Design and Engineering pedagogical practice are what the people and society need to move forward. According to Mathew (2008), we must of course be mindful of the need to sequence the reforms to minimize the costs and preventable pitfalls while maximizing the benefits. While looking forward to a better future through a good Design and Engineering Pedagogical Practice, we must be unmindful of the long and difficult journey ahead. This according to Silas (2010) implies that the socio-economic and physical development agenda of humanity and environment must of necessity be complemented by other reforms. These are reforms in the social, economic and political architecture that are consistent with deepening and sustaining life. We need to think about and act on reforms so as to jointly build a more sustainable future.

The need to teach effective accountability and transparency in Design and Engineering practice cannot be overemphasized. These must be integral and a collective responsibility to ensure effective implementation, monitoring and evaluation of programmes and projects. Design and Engineering pedagogical practice must according to Tolbert (2007) have a of no holistic approach that matches policies, concepts and finance to the facts and figures of the problems identified on ground. The practice must rely on excellent coordination of efforts to implement policies and programme therefore defined effectively.

The framework of stakeholders' involvement will facilitate synergy between implementing agents and provide for interaction between all stakeholders as integral part of the implementation, monitoring and evaluation process. Good pedagogical process (practice), according to Fisher (2006) must recognize the critical importance of an institutional framework to coordinate these various efforts, avoid duplications and waste in service delivery and facilitate developmental reforms.

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PEDAGOGICAL PRACTICE

The pedagogical practice must emphasize Timely and Reliable Statistic (TRS) as critical to effective planning, monitoring and evaluation. It must identify areas for direct intervention and provide periodic reviews to enable the system to be fine turned. The level (extent and quality) of pedagogy has more far reaching consequences on the levels of achievement and performance. Poor pedagogical impact is extremely costly both to the victims and the society. Tran humanism, an aspect of Design and Engineering Pedagogy is a very small but growing social acts that advocate the ethical use of technologies to enhance human capabilities extending human memories, sights and strength.

Of recent there have been changes in pedagogical formats and systems. Some internal and external forces have prompted these measures out of sincere concerns and out of the realities on ground (environmental demands, globalization, research, new policies and changes in technologies). There have also been several theories and contending issues on the changing trends in Design, Engineering, and Classroom Dynamics. Traditions and modern heritage at times work hand in hand but quite often are kilometers apart.

Wuritka (2003) suggested that those that can adjust to technological change and their social impacts on rational basis are those who are technologically literate. Therefore it is important to have technological literate population by providing education through the use of technology.

Therefore, in order to build a pedagogical content knowledge, teachers must know technology, know about students learning technology, what facilities are required, their environment and open ideas and above all experiences that facilitate their learning. Knowledge is wisdom, information, scholarship and understanding. Knowledge is the key ingredient of our technology recipe. Technology in teaching of technical courses includes the ability of teachers to have the taxonomic knowledge of all these technical courses in terms of the people, knowledge, creativity and skills. Teachers must know these pedagogical practices as a shift in paradiqm whatever area of their specialization.

THE CURRICULUM

Significant in any form of pedagogy is the curriculum which must contain informational values, goals and objectives leading to diverse strategies and technologies of teaching and learning. Information and Communication Technology systems are imposing, symbolic and unique performance but unfortunately most teachers in developing countries are yet to prove their worth in terms of serious input into the use of these materials and machines to upgrade training and capacity building.

Good pedagogical practice is foremost dependent on the curriculum according to Zuma (2007), it will enable the learner acquire the following:

(a) Develop ability to recall information

(b) Develop empirical attitude. This implies ability to integrate and analyze a given or recalled information, to compare, explain and calculate

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(c) Develop a sense of through thinking creativity and imaginatively producing something unique

(d) Evaluation skills, enabling the learner make judgments and expressing values

EFFECTIVE PEDAGOGY

Effective pedagogy is one that explores the various methods of teaching and learning experience. They are the following:

(a) Team teaching in which specialists in certain areas are allowed to teach their own areas.

(b) Field trips to enable the learner acquire firsthand knowledge of the real thing.

(c) Games and simulation to enable learners come very close to the actual experience, based on improvisation.

(d) Experimentation/project methods to allow the learner directly try out the newly acquired skills.

(e) Tutorials to enable the learners work in smaller groups for more personalized attention.

(f) Role play will enable the learner see himself or herself in a very practical position of application and policy judgments.

A combination of these teaching strategies will bring out the best in the learners, model desired behaviors, share expectations, establish positive atmosphere, actively involve the learner and make learning seem worthwhile. It will cultivate self esteem, capitalize on the learner's interests and curiosity, use reinforcement factors, promote individualized instruction, healthy competitions and reduce anxiety.

CONCLUSION

It must be an open "two"-way communication flow in which you talk and listen. The teacher must also listen to the students express their feelings, ideas and opinions in finding solutions to problems. Activities should not be extended beyond the learner's ability. The teacher must give clean directions and plan transitions with care and monitor the level of difficulties for individuals and groups.

With fast changing trends in global policies, practices and technologies, the time for radical action and personal sacrifices in teaching and learning in any field of human Endeavour is now.

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