

Learning Styles in Technical Drawing Courses as Perceived by Students in Egypt and Nigeria

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Abstract

Students have unique ways of learning, which may greatly affect the learning process and its outcome. In the process of education, instead of classifying students according to their insufficiency, teachers should try to get to know them and determine their cognitive, sensorial and kinetic characteristics. This study on improving learning style inventory, aims to help technical industrial teachers determine students' attributes in individualized educational activities in technical drawing course at technical/industrial colleges.

The study involved four stages: determining the questions for the learning style inventory, preparing the trial inventory, applying the inventory, and determining validity and reliability. Nine experts validated the instruments: four lecturers from the University of Nigeria; Nsukka, Nigeria, and Delta State University; Abraka, Nigeria, while five lecturers and experts validated the instrument in the College of Education, Assiut University; Assiut, Egypt and College of

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Education, Suez Channel University; Suez, Egypt. The reliability coefficient of 0.92 was determined using students that are not part of the population under study, but registered technical drawing as a common course in College of Technical Education; Beni- Suef University, and University of Nigeria. All the data obtained were analyzed using SPSS (t-test). As a result of the analysis eight factors were determined.

Introduction

The choices of learning styles by the students multiplied greatly in recent time, yet some students have not embraced some of the styles. Students have unique ways of learning, which may greatly affect the learning process and consequently their academic achievement and its outcomes. In the academic situations, it has been observed that performance of students vary from one person to another. Some perform excellently well in their academic pursuit while others perform below expectation and exhibit a dismal academic performance in spite of careful instruction and different learning styles adopted by the student (Ordu, 2004). However, the findings of some researchers show that poor performances of students is a result of the inappropriate learning styles adopted by the students (Heilat & et. al, 2010). Most researchers opined that most students apply the learning style that seems most appropriate to them at any particular time. Some learn listening to the lectures, telling anecdotes, and listening to technical education reports, while some examine and handle new tools and equipment in the school workshop during practical lessons. Researchers also observed that students learn by looking at pictures, singing, making practical jokes, drama, and movement of the legs and body. Furthermore, students learn by listening and watching radio and television, making

and receiving calls and texts, using cell phones, picture taking, and even sending e-mails to friends and relations.

In the tertiary institution where there are serious academic activities, students prefer a quiet and peaceful environment when learning to enable them to reason properly, discuss the lesson and take lecture notes. Tertiary in this study refers to formal education institutions called universities. Technical and industrial education students learn by understanding abstract concepts and putting the sketches, graphic drawings or maps of the abstract objects on paper. Lending credence to the foregoing ways and styles of learning by the students, the issue of the individual learning style that can yield a better result to enhance students' poor performance is still begging for an answer.

Learning and Learning Style

Learning is the transformation of internal representations. Learning may be said to have occurred if the mental processes by which one represents reality and internal understandings have been changed in enduring ways that are adaptive or advantageous to the individual. Anyamele (2004:136) citing Holloway provided the background for the discussion of the process of learning. They argue that any learning situation involves an interaction of three factor(s): a task to be accomplished, a style of learning it, and learning. In addition, they suggested that the model of learning the teacher operates on would be reflected in the interaction of these factors. One main distinction they marked is between "active" and "passive" learning. The passive model reflects behaviourist assumptions about the processes of learning and is based on a static conception of knowledge as a copy of reality, which has to be committed in its present form to the memory of the learner. In this view of knowledge, the task of the learner

is a straight forward one, knowledge in this circumstance is objective, external and quantitative in the sense that the more one learns the better his chances of being regarded as a competent student (Ololube, 2009). Here, in this study learning can be assessed in terms of what the student has achieved, the time taken on the task, and the relative efficiency of different "treatment". It is clear that a learning style body of knowledge has been accepted into the education literature and professional development agenda since the 1980s (Hickcox, 2006).

Learning style can be seen as the particular ways in which learning is done by the individual student in tertiary institutions. Hornby (2006) explained it as a style of learning. Learning style is defined as "a set of factors, behaviors, and attitudes that facilitate learning for an individual in a given situation" (Reiff, 1992: 7).

James and Blank (1993) categorized learning styles into three realms: perceptual, cognitive, and affective. The perceptual realm includes up to seven ways learners take in and absorb information from their environment. According to Cherry (as cited by Harvey, 2002), these seven perceptual learning-style factors are aural (listening), haptic (touching or holding), interactive (verbalizing and discussing with others), kinesthetic (body movement), olfactory (employing the sense of smell), print (reading and writing), and visual (viewing pictures, images, objects, and activities).

Bruce and Gerber (1995:444-458) characterized the different ways in which students experience learning as memorizing, acquisition of facts, procedures which can be retained or utilized in practice, abstraction of meaning, and an interpretative process aimed at understanding reality. Bruce and Gerber further assert that the first two of these ideas are related to the surface approach to learning, the next two concepts relate to deep approaches to learning, with the fifth

being somewhere in between. An analysis of the results of the same study shows six different ways in which student learning is experienced or understood by teachers. These conceptions are presented by description:

- 1) Learning is seen as acquiring knowledge through the use of study skills in the preparation of assessment tasks.
- 2) Learning is seen as the absorption of new knowledge and being able to explain and apply it.
- 3) Learning is regarded as the development of thinking skills and the ability to reason.
- 4) Learning is seen as developing the competencies of beginning professionals.
- 5) Learning is seen as changing personal attitudes, beliefs, or behaviours in responding to different phenomena.
- 6) Learning is seen as a participative pedagogical experience.

Ololube (2006) reiterated the above discussion and explained it as what learning is, how it is achieved, the learning style adopted and how the accomplishment of learning is demonstrated. These categories according to Ololube are internally related, and they indicate how learning is understood.

Muir (2001) explains that based on what we have learned, we conclude that students need:

- A variety of teaching strategies
- A variety of learning paths
- Activities which they can read, visualize, hear, say and do
- Instructional guidance leading to independence
- Ability to work on their own with appropriate assessment methods
- Appropriate tools and technology for independent and guided study

Statement of the Problem

There is a growing concern over the astronomical decline in students' academic achievements in technical drawing courses in tertiary institutions in Nigeria and Egypt. It appears to the researchers that the products of the tertiary institutions in Nigeria and Egypt are performing below expectation. The dwindling state of students' academic achievements calls for an immediate and urgent solution in tertiary institutions in Nigeria and Egypt. The choice of a good learning style is a difficult task for the students because a lot of physical and mental energy is required, and the success of the technical and industrial education program depends on the preferred learning styles of the students. A poor choice of individual learning style and acquisition of knowledge by the students in the classroom can lead to inappropriate behaviour and frustration on the part of students. Learning styles selected by individual students might affect their achievements positively or negatively depending on their disposition and environment at different levels. One style is not necessarily preferred over the other as a result of individual differences, but achieving balance with the chosen learning styles can lead to individual benefits.

In developing learning styles, students are faced with challenges of selecting appropriate styles suitable for achieving educational objectives. At the moment, it appears that some factors contributing to poor achievement include students' poor study habits, learning styles, (Kazulu, 1990) and teacher ineffectiveness (Ezike, and Obodo, 1990). The conventional methods of learning style adopted by the students in different tertiary institutions appear inefficient for the learning of technical drawing subjects. Hence it is desirable to investigate learning styles in technical drawing for the tertiary institutions students in Egypt and Nigeria.

Purpose of the Study

It is based on this, therefore, that the study is aimed at identifying the learning styles that can bring the objectives of Technical/Industrial education to reality and to ascertain the perception of students on these styles.

Specifically, the study is meant to:

- 1) Identify the Learning Style appropriate for a Technical/Industrial Drawing course
- 2) Determine the Learning Style that can enhance technical/industrial students' performance
- 3) Ascertain students' perception of these Learning Styles, which can enhance technical/industrial students' performance.

Research Questions

- 1) What are students' perceptions on the learning style that can enhance the students' performance in Nigeria?
- 2) What are students' perceptions on the learning style that can enhance the students' performance in Egypt?

Hypothesis

Ho1: There is no significant difference between the mean responses of students' perception on the use of learning styles in Nigeria and Egypt.

Methodology

The study adopted the cross sectional survey method. The population was made up of the 46, 20, 12 and 18 students in their first, second, third and fourth years in the Technical Education Department, Delta State University, Abraka in Nigeria (2009/2010 session); while the population of students in the Architecture and Civil Construction Departments, was given as 32, 36, 34 and 30 in the first, second, third and fourth years at the Beni- Suef University, Egypt. The entire population of students in Nigeria and Egypt were involved in the study. There was no sampling because of small number of students involved in the study. The instrument used was inventory of learning style (Güvan & Özbek, 2007) (Platsidou & Metallidou, 2009) (Hogan, 2009). The inventory was designed using a four – point rating scale. Two 27-item inventories were designed to elicit information using the inventory in Delta State University, Abraka, Nigeria and Beni-Suef University, Egypt, college of industrial education respectively.

Nine experts validated the instruments; four lecturers from the University of Nigeria and Delta State University, and five lecturers and experts in the College of Education, Assiut University and Suez Channel University. The reliability coefficient of 0.92 was determined using students that are not part of the population under study, but registered technical drawing as a common course in Suez Channel University and University of Nigeria. A grand mean value of 2.50 and above qualifies the learning style while a grand mean value below 2.50 disqualifies the learning style. All the data collected at the end of the analysis were analyzed using t-test with SPSS package.

Results

Research Question 1

What are students' perceptions on the learning style that can enhance the students' performance in Nigeria?

Table 1

Response on Students' Perception on the Learning Style in the Tertiary Institution in Nigeria

| S/N | HOW CAN I LEARN? | Completely Appropriate | Appropriate | Inappropriate | Completely Inappropriate | \bar{X} | SD |
|-----|--|------------------------|-------------|---------------|--------------------------|-----------|------|
| | | 4 | 3 | 2 | 1 | | |
| 1. | I like telling anecdotes | 25 | 34 | 26 | 8 | 2.82 | 0.93 |
| 2. | When I listen to the course, I draw about the subject that I try to learn. | 28 | 55 | 4 | 6 | 3.13 | 0.77 |
| 3. | I like listening to technical education reports. | 28 | 36 | 24 | 5 | 2.94 | 0.88 |
| 4. | I always examine and handle new tools and equipment. | 40 | 42 | 8 | 3 | 3.28 | 0.76 |
| 5. | I always feel pleased if there are pictures related with the subject in the book I read. | 53 | 30 | 5 | 5 | 3.41 | 0.82 |
| 6. | I like sketching and drawing when reading. | 8 | 9 | 27 | 49 | 1.74 | 0.95 |

| | | | | | | | |
|-----|---|----|----|----|----|------|------|
| 7. | I don't like making practical jokes on my friends. | 10 | 23 | 41 | 19 | 2.26 | 0.91 |
| 8. | I have difficulty in imagining events on my mind. | 10 | 17 | 37 | 29 | 2.09 | 0.96 |
| 9. | When I listen to the lesson or study, I move my legs involuntarily. | 12 | 16 | 38 | 27 | 2.14 | 0.99 |
| 10. | I like telling rather than writing when I learn. | 21 | 17 | 50 | 15 | 2.58 | 0.90 |
| 11. | I learn the subject easier with pictures and maps. | 37 | 38 | 8 | 10 | 3.42 | 3.24 |
| 12. | I like reading aloud when I learn. | 6 | 14 | 42 | 31 | 1.95 | 0.86 |
| 13. | I listen to radio and television loudly. | 6 | 22 | 36 | 29 | 2.05 | 0.90 |
| 14. | I like cleaning the blackboard, and opening and closing the window. | 21 | 31 | 26 | 15 | 2.62 | 1.01 |
| 15. | I prefer a silent environment | 74 | 14 | 3 | 2 | 3.72 | 0.63 |
| 16. | It difficult for me to draw graphs, pictures and maps. | 9 | 17 | 35 | 32 | 2.03 | 0.96 |
| 17. | When I listen to the lesson noise my friends make causes me to have difficulty in learning. | 40 | 24 | 16 | 13 | 2.98 | 1.08 |
| 18. | I think that the best way to remember what I learn is to imagine them on my mind. | 54 | 33 | 4 | 2 | 3.50 | 0.69 |
| 19. | I don't like eating something or chewing when I study. | 27 | 18 | 26 | 22 | 2.54 | 1.15 |
| 20. | I learn better by taking | 52 | 36 | 3 | 2 | 3.48 | 0.67 |

| | | | | | | | |
|-----|--|----|----|----|----|-------------|--------------|
| | notes repeatedly after each lesson. | | | | | | |
| 21. | I don't like technical education group assignment. | 12 | 26 | 29 | 26 | 2.26 | 1.01 |
| 22. | When I learn, like playing with coins or keys in my pocket. | 6 | 5 | 28 | 54 | 1.60 | 0.86 |
| 23. | I like learning by discussing the lessons with my friends in the class. | 53 | 34 | 4 | 2 | 3.48 | 0.69 |
| 24. | When I study, I frequently take a break and do other things | 26 | 23 | 30 | 14 | 2.66 | 1.05 |
| 25. | I want my teacher to correct me by explaining when I give wrong answers in the lesson. | 68 | 19 | 4 | 2 | 3.65 | 0.67 |
| 26. | I remember easier when I learn the subject by applying it. | 58 | 33 | 1 | 1 | 3.59 | 0.58 |
| 27. | I learn better by taking notes and writing when I repeat the lesson. | 64 | 26 | 3 | 0 | 3.66 | 0.54 |
| | Grand Mean | | | | | 2.91 | 0.615 |

Data in Table 1 shows the result obtained from the respondents on students' perception on the learning styles in Nigeria. The mean ranged from 1.60 to 3.72 which qualified the students adopting their peculiar learning styles in Nigeria. In most of the items the students attested that the best learning usually depends on the content of a particular study or context of the lesson note given to them by the technical drawing teacher. In the Table, items with a mean below 2.50 is inappropriate as a learning style while mean above 2.50 is considered appropriate. Table 1 had a grand mean of 2.91 and SD = 0.615.

Research Question 2

What are students' perceptions on the Learning Style that can enhance the students' performance in Egypt?

Table 2
Response on Students' Perception on the Learning Style in the Tertiary Institution in Egypt

| S/N | HOW CAN I LEARN? | Completely Appropriate | Appropriate | Inappropriate | Completely Inappropriate | \bar{X} | SD |
|-----|--|------------------------|-------------|---------------|--------------------------|-----------|------|
| | | 4 | 3 | 2 | 1 | | |
| 1. | I like telling anecdotes | 42 | 71 | 12 | 7 | 3.11 | 0.78 |
| 2. | When I listen to the course, I draw about the subject that I try to learn. | 48 | 65 | 11 | 8 | 3.16 | 0.82 |
| 3. | I like listening to technical education reports. | 33 | 57 | 27 | 15 | 2.82 | 0.94 |
| 4. | I always examine and handle new tools and equipment. | 48 | 68 | 8 | 8 | 3.18 | 0.80 |
| 5. | I always feel pleased if there are pictures related with the subject in the book I read. | 45 | 68 | 8 | 11 | 3.11 | 0.85 |
| 6. | I like sketching and drawing when reading. | 23 | 27 | 57 | 25 | 2.36 | 0.98 |
| 7. | I don't like making practical jokes on my friends. | 38 | 63 | 22 | 9 | 2.99 | 0.86 |
| 8. | I have difficulty in imagining events on my mind. | 33 | 44 | 34 | 21 | 2.67 | 1.02 |

| | | | | | | | |
|-----|---|----|----|----|----|------|------|
| 9. | When I listen to the lesson or study, I move my legs involuntarily. | 28 | 38 | 45 | 21 | 3.15 | 1.09 |
| 10. | I like telling rather than writing when I learn. | 25 | 28 | 47 | 32 | 2.35 | 1.05 |
| 11. | I learn the subject easier with pictures and maps. | 50 | 68 | 8 | 6 | 3.15 | 0.82 |
| 12. | I like reading aloud when I learn. | 46 | 72 | 8 | 6 | 3.19 | 0.75 |
| 13. | I listen to radio and television loudly. | 25 | 39 | 46 | 22 | 2.41 | 1.04 |
| 14. | I like cleaning the blackboard, and opening and closing the window. | 46 | 72 | 10 | 4 | 3.21 | 0.71 |
| 15. | I prefer a silent environment | 46 | 70 | 8 | 8 | 3.17 | 0.79 |
| 16. | It difficult for me to draw graphs, pictures and maps. | 24 | 31 | 48 | 29 | 2.38 | 1.02 |
| 17. | When I listen to the lesson noise my friends make causes me to have difficulty in learning. | 23 | 29 | 50 | 30 | 2.34 | 1.02 |
| 18. | I think that the best way to remember what I learn is to imagine them on my mind. | 20 | 34 | 48 | 30 | 2.33 | 0.99 |
| 19. | I don't like eating something or chewing when I study. | 23 | 33 | 49 | 27 | 2.39 | 1.00 |
| 20. | I learn better by taking notes repeatedly after each lesson. | 28 | 34 | 42 | 28 | 2.47 | 1.05 |
| 21. | I don't like technical education group assignment. | 28 | 24 | 49 | 31 | 2.37 | 1.07 |
| 22. | When I learn, like playing with coins or keys in my pocket. | 22 | 28 | 46 | 36 | 2.27 | 1.04 |

| | | | | | | | |
|-------------------|--|----|----|----|----|-------------|--------------|
| 23. | I like learning by discussing the lessons with my friends in the class. | 42 | 71 | 15 | 4 | 3.14 | 0.73 |
| 24. | When I study, I frequently take a break and do other things | 24 | 31 | 49 | 28 | 2.39 | 1.02 |
| 25. | I want my teacher to correct me by explaining when I give wrong answers in the lesson. | 20 | 30 | 51 | 31 | 2.39 | 0.99 |
| 26. | I remember easier when I learn the subject by applying it. | 22 | 37 | 48 | 25 | 2.51 | 1.47 |
| 27. | I learn better by taking notes and writing when I repeat the lesson. | 28 | 22 | 51 | 31 | 2.36 | 1.06 |
| Grand Mean | | | | | | 2.71 | 0.409 |

Table 2 shows the perception of students from item 1-27 indicating their mean responses and standard deviation. The mean ranges from the minimum of 2.27 to maximum mean of 3.51 with their respective standard deviation of 1.04 and 1.09. It can be explained further in Table 2 that the appropriate learning styles are usually indicated as values above 2.50 as appropriate and inappropriate learning styles are usually below 2.50. The benchmark of the study is 2.50 as clearly stated in the research work. Table 2 had a grand mean of 2.71 and standard deviation of 0.41.

Hypothesis Testing

H₀₁: There is no significant difference between the mean responses of students' perception on the use of learning styles in Nigeria and Egypt.

Table 3
SPSS Summary of T-test analysis of student perception on the use of learning styles in Nigeria and Egypt

| | N | Mean | Std. Deviation | Std. Error Mean |
|---------|-----|--------|----------------|-----------------|
| EGYPT | 132 | 2.7095 | .40921 | .03562 |
| NIGERIA | 93 | 2.9047 | .61460 | .06373 |

Table 4
SPSS Summary of T-test Analysis of student Perception on the Use of Learning Styles in Nigeria and Egypt

| | Test Value = 0 | | | | | |
|---------|----------------|-----|-----------------|-----------------|---|--------|
| | | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| EGYPT | 76.072 | 131 | .000 | 2.70947 | 2.6390 | 2.7799 |
| NIGERIA | 45.578 | 92 | .000 | 2.90473 | 2.7782 | 3.0313 |

The results from Table 3 and 4 indicated that there is a significant difference between the learning styles in Egypt and Nigeria as perceived by students in the institutions in the different countries. This indicated that there is significant difference between the mean perception on the learning styles in Nigeria and Egypt.

Discussion

The findings of the research questions revealed that the learning style in Nigeria was not appropriate in items 6, 12 and 22 while it is appropriate in the other items not mentioned. The responses of the students indicated that they adopt the best learning styles in learning the technical drawing subject in Nigeria. The responses in Table 1 indicated that in item 6, 12 and 22 are inappropriate learning styles for acquiring technical drawing skills as perceived by the students in Nigeria.

Olaitan (1999) indicated that for the learning process to be effective, knowledge of subject matter as well as skills in technical drawing should be demonstrated by students and teachers. The students' responses showed that learning styles in technical drawing are rigid and peculiar to particular students. The students attested that different learning styles can be used to achieve learning in schools. Educators have called for improved quality of learning styles so that the needs of typical students, such as underachievers or slow learners, can be met by helping them improve upon their achievements in technical drawing and engineering.

Okafor (1993) carried out a study on the teaching and learning styles for increasing the interest of senior secondary school students in technical drawing. The study was designed to determine the learning styles and strategies for increasing the interest of senior secondary school students in technical drawing. The findings of the study revealed that students

interest in technical drawing include among others: a better learning styles for technical drawing students, retention of good learning style to improve performance of the students and the use of appropriate learning styles.

Judging from the results on Table 1, it indicates that the majority of the items had a mean above 2.50 which suggests that the learning styles adopted by the students in Nigeria are multifaceted and peculiar to the need of a student. The Table further revealed that students adopt a particular learning style when the need arises and they are determined. The most suitable learning styles enable them to achieve their academic needs in the classroom. The study revealed that the students regarded the learning styles as a component skill approach to acquisition of knowledge in technical drawing. Learning styles is considered by the students as a panacea for building competence in the classroom and a strategy for effective performance. The National Policy on Education (2004) stipulates among other things that technical education should ensure students acquisition of appropriate skills, abilities and both theoretical and practical competences as equipment for them to contribute to the development of the nation.

The findings in this study show a number of diverse opinions of students with regards to their learning styles in various levels and institutions. They opined that learning styles as a prerequisite for writing examinations is in order as this can lead to effectiveness of students and to adapt the best style suitable to individual students to enhance familiarity with course content and lecturers as well as a providing adequate documentation for record purposes.

The findings also revealed that there is a significant difference between the mean perception of students in Nigeria and Egypt. The implication of the study is that students should be properly guided on the best learning styles in Nigeria and

Egyptian Universities to enable students to achieve the best in technical drawing in the different countries.

Recommendations

Based on the findings of the study, the following recommendations were proffered as instrument for re-engineering technical drawing courses in Nigeria and Egypt:

- i) The students in Nigeria and Egypt should be properly guided and given incentives to select individual learning styles that are appropriate and applicable in their environment for them to achieve their personal academic objective.
- ii) The students in Nigeria and Egypt should adopt a suitable learning style that would be beneficial to them.
- iii) The two countries should agree on exchange programmes between Nigeria and Egypt to create an environment where students can interact, and exchange ideas on their individual learning styles to enable them improve on their personal learning style for academic growth.
- iv) The institutions in Nigeria and Egypt should establish E- libraries in the various universities where students could explore their learning style through E- mail, face-book and other means of exchanging knowledge through information and communication technology.
- v) Students in Nigeria and Egypt should establish a stronger diplomatic tie where scholarship and study grants information are given to students to travel and study either in Nigeria or Egypt to establish a better international relationship between their countries in order to learn and adapt their own individual learning style.

- v) The students in both countries should be given the enabling environment for self-study skills in technical drawing programme using learning styles applicable or peculiar to individual students in Nigeria and Egypt.

Conclusion

From the foregoing discussion, it is obvious that students have different opinions regarding preferred learning styles and there is a difference in these opinions among students in Nigeria and Egypt. It is a settled fact to know that good environments for the students will cultivate individual choices of learning styles, which is a key to national development and modernization in the different countries. It is hoped that even those who are seen practicing the selection of learning styles in the institutions are equipped with lifelong skills through exposure to functional education. In the absence of the students' learning styles peculiar to individual choice, their educational goals cannot be actualized in their various institutions. In Nigeria, the learning styles most accessible and acceptable to all, is the best learning style that can assist the individual student to achieve their academic attainment. This is also applicable to different students in Egypt and other parts of the world.

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