

EVALUATING THE GAP BETWEEN OVERT AND OPERATIONAL CURRICULUM IN ARCHITECTURAL EDUCATION: IMPLICATION FOR PROFESSIONAL PRACTICE

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Abstract

The term curriculum refers to the lessons and academic content taught in a school or in a specific course or program. However, experiences over time have shown that there is an apparent gap between overt curriculum (written as part of formal instruction to support the intentional instructional agenda of a school) and operational curriculum (actual curriculum that is delivered and presented by each teacher). This paper examined this gap in selected courses offered in the undergraduate architectural programme in Covenant University, Ota, Nigeria. The three selected courses were those that had been taught by different teachers in different academic sessions. Data was obtained from content analysis of overt and operational curricula of the selected courses and from lecture notes given to students. Findings revealed that there were fundamental gaps between overt and operational curriculum in the selected courses. Major gaps identified were that teachers' subject overt curriculum to: their beliefs and interpretation; teaching styles; and available academic texts. The paper submits that these variations and deviations may have adverse effect on the training of future professionals and consequently on practice. The paper recommends that Schools of Architecture by way of policy should establish quality control and monitoring mechanism measure that ensures that 'what is written is actually what is taught'.

Keywords: Architecture, Curriculum, Education, Covenant University, Nigeria.

1 INTRODUCTION

The job of a teacher, according to [1] involves helping the students to achieve their learning goals by teaching meaningful contents and engaging the students in relevant activities. In the process, the teacher is expected to address the need of each student to ensure that all students are successful. The learning goals are often specified in the curriculum for each course. The architecture curriculum in Nigeria is often a blend of the requirements of the Nigerian Universities Commission (NUC), the Nigerian Institute of Architects (NIA) and the mission of individual universities, to meet the needs of the profession. Although the content of each course is often explicitly set out, the implementation in the classroom depends on the interpretation of individual lecturers. In other words, implementation depends on the way(s) each lecturer use the curriculum. This may create a chasm between the overt curriculum, which is the intention of the institution, and the operational curriculum, which is what the students actually experience. In fact, [2] suggested that teachers use curriculum materials in flexible ways, depending on their interpretation. This results in varying classroom experiences. In addition, [3] identified three stages of curriculum implementation. These are reading, evaluating and adapting. In reading the curriculum, the teacher attempts to get the big idea, while in evaluating, the teacher attempts to judge aspect of the curriculum. Thereafter, the teacher adapts the curriculum to the students. In this case, the teacher makes changes to the curriculum in terms of structure, activities and purpose to suit a particular set of students at a particular time. This is often the reason that the overt curriculum is different from the operational curriculum. [3] observed that while some teachers may omit some aspects of the overt curriculum in their adaptation, others would add new components to the curriculum to meet perceived needs of the students. In fact, studies suggest that the implementation of the curriculum is determined by the teacher's perceptions of the needs and capabilities of the students. There are very few studies however, that investigate the gap between the formal or overt curriculum.

[4] linked the fidelity to the implementation of overt curriculum to the students' academic achievements. The focus of this study is architectural education. The reason for this is that architectural education has often been identified with apprenticeship, where skills in daily practice are modeled in the classroom. There is therefore the need to understand how teachers, particularly in

architecture, use the overt curriculum. Although the bodies that dictate the components of the curriculum have specified what should be taught, however, it is important to investigate the perceived gaps that may exist in terms of what the students are expected to know and what they are actually taught? In the light of the fact that different teachers interpret the curriculum in different ways, it is expedient to know how interpretations of the same curriculum vary with different teachers. This investigation was carried out in Covenant University, an architecture school in Nigeria, using three courses that have been taught by different lecturers over the years. A study of this nature may give some insight into the level of preparedness of the students for professional practice. This is because such investigation would reveal if the course objectives were being achieved. It may also reveal how a change in the teacher teaching a particular course may modify overt curriculum. Another important justification for this study is may suggest needed reviews to the courses investigated.

2 LITERATURE REVIEW

Curriculum, according to [2] is a framework that specifies what should be taught in the classroom. [5] however put this differently for higher education. These researchers stated that curriculum in higher education includes the content of a specific subject, the time frame within which they occur, the learners' personal views and pedagogical techniques. In this context, [5] suggested that curriculum might imply an imposed curriculum, which they suggest, limits academic freedom. In education generally, [2] identified three categories of curriculum. The first is the intended curriculum, which involves the teacher's aims. The teachers' aims are often to the interpretations and teaching styles of such teacher. The second and the third, which are the focuses of this study, are the formal and the intended curricula. The formal curriculum, referred to in this study as overt curriculum, includes all activities and learning guides stipulated by the university, while the experienced or enacted curriculum, referred to in this study as the operational curriculum, is what actually takes place in the classroom. The operational curriculum results from the construction of teachers and is often described as curriculum-use.

Curriculum-use, according to [2] is the way individual lecturers *interacts with, draw on, and are influenced by material resources designed to guide instructions*. It is often believed that a teacher would use the guide provided by the curriculum to construct classroom activities. There are many studies, which have investigated how the teacher implement or subvert the text of the curriculum. The studies on curriculum use dates back to the study of [6] who found mismatches between the guides provided by the text of curriculum and eventual classroom practices.

Curriculum use can be viewed as the process by which a teacher incorporates texts of curriculum into their instructions to construct the experienced curriculum. In this case, the curriculum texts, along with teacher's interests, commitment, knowledge, experience, and expertise [1], [2] determine the curriculum the students actually experience in the classroom. Textbooks are said to provide a framework about what should be taught in the classroom [7]. A major concern in the university setting however, is that the institutions rarely recommend textbooks. Instead, individual lecturers source for and recommend textbooks that they deem fit to achieve their objectives of delivering lectures on set out topics or modules. This probably poses the question of how much of the overt/formal curriculum is covered. This is in addition to the assertion of [2] that when teachers use the curriculum in a flexible way, the potentials of the curriculum are unlocked. Although [2] recommended is that authorities should specify textbooks, which would help teachers to follow the content of curriculum. This author however noted that, even when the same textbooks are used by different teachers, the interpretation of the goals vary considerably. Similarly, adaptations of the activities recommended in the texts would also vary. These variations have been attributed to contrasting views as well as pedagogical competencies [8]. [2] also attribute the differences in interpretation and implementation of overt curriculum to the need of the teacher to make the curriculum responsive to the students. In other words, the operational curriculum may result from the teacher reconstructing the curriculum to suit particular students or situations. This is probably why [2] described the experienced or operational curriculum as responsive, interactive and emergent.

Another factor that is said to influence the use of curriculum in the classroom is the teacher's perception of the curriculum. Scholars suggest that teachers often believe that curriculum developers cannot address all the needs of the school or the classroom [2]. This may result in individual teachers modifying the curriculum as they deem fit, when they are not satisfied with the overt curriculum. Even when textbooks are recommended, [7] specified three ways in which teachers use the textbooks. They may adhere strictly to its contents, elaborate on it using other materials or create their own notes from

different sources. Those who elaborate or create their own notes teach what suits the immediate classroom setting and characteristics, often based on their beliefs and interpretation.

Different teachers often carry out the implementation of formal/overt curriculum to different levels. [4] recommend measuring implementation in terms of structure of the curriculum (adherence to content and duration specified) and the process (use of techniques and methods specified and in an environment that suits the program). Another criterion used in measuring implementation is the extent to which students are engaged in activities as specified. These dimensions are investigated in this study.

3 RESEARCH METHODS

The curriculum of architecture department, Covenant University was selected for this study. Five courses were studied in the second and third years with courses that have been handled by at least two different lecturers in the last three years. Content analyses of the courses were carried out to investigate adherence to the content by the different lecturers. The curricula were qualitatively analyzed with the aim of comparing the contents with the subject areas of the course objectives as identified by the overt (written) and operational (taught) curriculum in terms of the specifications in the hand book, lecturers' course compact objectives and outlines as taught by different teachers. Commonalities were denoted as common factors (CF) and gaps were identified by differential factors (DF) or quotients (Q).

4 RESULTS

The results as presented in Tables 1 revealed the areas specified by the departmental hand book and the taught outlines as highlighted by different course lecturers respectively. The courses in the investigated were ARC224, ARC315, ARC316, ARC325 and ARC326. Table I suggests that all the core objectives as dictated by departmental hand book appear to have been addressed by the course objectives by the lecturers. There were commonalities observed in most cases. For instance, the commonality factor in ARC224 was significant between the written aspect of the curriculum and the taught aspects in the areas of (i) basic skills and communication techniques; (ii) physical morphology (forms and spaces); (iii) use of material on spaces like floor finishes, wall finishes etc. and (4) Basic Drawing skills. However, there was a reasonable significant difference between what was written in the handbook and what was taught by the lecturer in the course outlines for the course. Architectonics, anthropometrics, and abstract design were not clearly spelt out in the hand book but were included in the taught outlines. More so, perspectives drawing which was written in the curriculum was excluded and de-emphasized.

Another course that was handled differently was ARC315. A major aspect in the hand book - Three-moment theorem and application to continuous beams were also excluded from the taught outlines (or curriculum). Better still, other major areas like (i) structural forms and systems; (ii) innovative structural systems – arches, cables, shells, pneumatic structures, etc.; (iii) estimation of loads on buildings (dead load, live load, wind load) were all emphasized in the taught outlines. In ARC316, the taught outlines covered areas such as the flooring aspect of the written (hand book) course objectives were emphasized but walling details was de-emphasized.

In ARC325, there was no significant differential factors (DF/Q) between the written and taught curriculum because the major areas of emphasis in the curricula of the departmental hand book which includes (i) slope deflection equations and applications to beams and frames, (ii) Moment distribution, application to continuous beams and frames and (iii) introduction to reinforced concrete design, philosophies, working stress, factor method and limit states were the commonalities(CF) per specification in the curriculum.

TABLE 1: GAP BETWEEN OVERT AND OPERATIONAL-TAUGHT CURRICULUM

COURSE EXAMINED	OVERT - HAND BOOK SPECIFICATION	COURSE OBJECTIVES	OPERATIONAL- TAUGHT OUTLINES	DIFFERENTIAL FACTORS (DF)	COMMON FACTORS(CF)
<p>ARC 224</p>	<p>The objective of the course is to endow the students with the basic skills and communication techniques of describing fairly and accurately an object, with the use of straight lines and curves. It is further envisaged that, at the end of the course, the students will be able to describe graphically the followings: Perspective of buildings, non-rectilinear buildings, buildings with shadows, as a way of rendering; orthographic projections, etc.</p>	<p>(i)The objective of the course is to use abstract design to develop creative thinking, analytical skills and aesthetical sensitivity of the students in architectural design.(ii)It introduces the student to the basic principles of drawing and the use of drawing equipments.(iii)The course concentrates on design projects, which consolidates the students' basic drawing skills, especially their application in articulating design.(iv)It helps the student to understand the various uses of materials for the different buildings.(v)The course basically improves the measurement skills of the students and the use of different media for presentation.(vi)It also gives the student understanding of the fundamental design principles and introduces the concept of forms and spaces.</p>	<p>Module1: (1)Introduction to Abstract Design (2) Architectural forms (3) Principles of portion (4) Rhythm, harmony, contrast texture, mass, volume etc. (5)Architectonics and anthropometrics</p> <p>Module 2:(1)Physical Morphology and Attributes of Spaces(2)Ordering of spaces(3)circulation and imaginative use of forms interior and architecture</p> <p>Mid semester test: (4)Use of material on spaces like; floor finishes, wall finishes etc.(5) How to prepare schedules for doors, windows, finishes, specifications etc</p> <p>Module 3: (1) Architecture and Oral Design Process(2)site investigation/analysis(3)functional relationship(4) Application of standard measurement(5)Revisions</p>	<p>Architectonics and anthropometrics (included)</p> <p>(1) Abstract Design(included)</p> <p>(2)Perspectives</p> <p>(Excluded or not Emphasized)</p>	<p>basic skills and communication techniques</p> <p>(2) physical morphology (forms and spaces)</p> <p>(3) Use of material on spaces like; floor finishes, wall finishes etc.</p> <p>(4)Basic Drawing skills</p>
<p>ARC315</p>	<p>Introduction to structural forms and system, solid structure, skeletal structures, surface structures.</p> <p>Innovative structural systems – Arches, Cables, Shells, Pneumatic structures etc.</p> <p>Estimation of loads on buildings (dead load, live load, wind load)</p> <p>Deflection analysis of statically determinate and indeterminate structures.</p> <p>Three –moment theorem, application to continuous beams only</p>	<p>(i)The principles and the uses of various structural forms(ii)The various innovative structural systems and their applications in building construction(iii)How to estimate loads on structural systems(iv)Analysis of pin-jointed frames(v)Slope and deflection analysis of both statically determinate and statically indeterminate prismatic beams</p>	<p>Module 1: Review of Structural Forms</p> <p>(1)Introduction to structural forms and systems, types of structure and their applications, innovative structural systems e.g. arches, portal frames, cables, shells, slabs, pneumatic structures and their applications in real life situations</p> <p>Module 2: Estimation of Load on Buildings</p> <p>(1) Types of support systems, determinate and indeterminate structures(2) Loads on structures, resultants of concurrent force systems, calculation of support reactions</p> <p>Module 3: Frame Structures (1) Introduction to principles of frame structure, analysis of pin jointed frames (2): Analysis of trusses using method of joint/resolution (3) Method of Section(4) Methods of tension coefficients(5) Bending Moments and Shear Force(6)Revision on the concepts of bending moment and shear force(7) Bending moment and shearing force diagrams(8) Deflection Analysis of Statically Determinate Structures (9) Introduction to Slope and deflection of prismatic beams(10) Deflection in statically determinate beams using methods of formulas (11) Analysis of determinate beams using the superposition method(12) Revision</p>	<p>Three –moment theorem, application to continuous beams only(excluded)</p>	<p>(1)Structural Forms ,&Systems(2) Innovative structural systems – Arches, Cables, Shells, Pneumatic structures etc(3) Estimation of loads on buildings (dead load, live load, wind load)-all emphasized</p>

<p>ARC316</p>	<p>(i)Typical floor characteristics, space requirements, sizes, activates, form of buildings, and the symbolic meaning of the form. (ii) Simplest types of buildings to the most complicated building spaces where many human and non-human activities are collected. (iii)Basic information for studio assignment.(iv)The objective of the course is to make the students conversant with the techniques of construction.(v)Fundamental principles of construction which would make the scope more broad-based and develop towards more innovative approach for any new materials being developed and their consequent were in the practice(vi)The course has been divided into</p> <p>-the rudimentary construction principles of essential building components while</p> <p>- the application of these principles in solving details for different situations.</p>	<p>(i)Flooring systems used for ground floors. These includes on-grade and suspended floor slabs, floor topping (finishes), cast-in-situ and precast floor tiles, skinning, dado.</p> <p>(ii)Basic types and principles of walling</p>	<p>Flooring details</p> <p>(1) Types of floors (on-grade and suspended)</p> <p>(2) Types of floors (suspended)</p> <p>(3) Floor construction processes/ techniques/ methods(4) Floor finishes (cast in-situ and Precast floor tiles, Skinning, dado</p> <p>Walling details (1)Section through floors(ii)Introduction to walling, Types/ choice of walls(iii)Walling materials(iv) Block and brick wall(types, classifications, properties)(v)Bonding and renderings</p> <p>(vi) Wall openings (arches, lintels etc.)(vii) Insulation on walls (types, types of fixing, vapour checks)(viii) Wall finishes</p>	<p>while the walling aspect de-emphasized.</p>	<p>Only the flooring aspect of the written(hand book) course objectives were emphasized</p>
<p>ARC325</p>	<p>(i)Slope deflection equations and applications to beams and frames</p> <p>(ii)Moment Distribution, application to continuous beams and frames.</p> <p>(iii)Introduction to reinforced concrete design, philosophies, working stress, factor method and limit states.(iv) Review of properties and behaviour of concrete and steel strength, durability, effect of temperature etc.</p>	<p>(i)The application of slope deflection equations in the analysis of beams and frames(ii)The concept of Moment distribution and it application to continuous beams and frames(iii)The Philosophies and the different theory behind reinforced concrete design (iv) How to design reinforced concrete elements and should be able to design simple R.C elements like beams and columns (v)The behaviour of concrete and steel under different environmental conditions and their suitability as materials for structural elements</p>	<p>Module 1: Slope and Deflection of Beams</p> <p>(1) Review of Slope and deflection of Beams-Propped beam, continuous beam, Fixed Ends beam (2) Slope deflection Equation, its application to beams (3) Slope Deflection Equation, its application to Frames</p> <p>Module 2: Moment Distribution: (1)Application of Moment Distribution to Continuous beam</p> <p>(2) Application of Moment Distribution to Frames</p> <p>Module 3: Introduction to Reinforced Concrete Design</p> <p>(1) Reinforced Concrete Design Philosophies, (2)Working Stress Method of Design (3) Factor Method of reinforced concrete design(4) Concept of Limit state Design Module 4: Property and Behaviour of Concrete (1) Introduction to concrete as a structural material, terminologies associated with concrete (2) strength, durability and effects of temperature and fire on concrete (3)Steel as structural material, its behaviour and properties(4)Revision and Evaluation</p>	<p>No Significant DF Factors</p>	<p>(i)Slope deflection equations and applications to beams and frames(Emphasized)</p> <p>(ii) Moment Distribution, application to continuous beams and frames.</p> <p>(iii) Introduction to reinforced concrete design, philosophies, working stress, factor method and limit states.</p>

<p>ARC326</p>	<p>Concrete and Glass as materials of modern construction.</p> <p>(i) Concrete: materials associated with cements, aggregates, water, admixtures, concrete mixture, properties of concrete, site production, reinforcement, curing, finishing, prestressed concrete, testing of concrete and concrete materials, precast concrete.</p> <p>(ii) Glass: Glass as flooring, roofing and acoustic materials manufacture, properties, type, other glass products, work on glass, glass fibre products.</p>	<p>(1) Understand the characteristics/ behavior and application of concrete (2) Grasp thorough knowledge of glass, glass products and applications as flooring, roofing and acoustic materials. (3) Be able to utilize special types of doors and staircases with associated details in real designs/ studio assignments.</p>	<p>Module 1: Concrete</p> <p>(1) Concrete-materials associated with cements, aggregates, water, admixture, concrete mixture, properties of concrete. (2) Concrete- site production, reinforcement, curing, finishing and testing.(3) Prestressed concrete- types and principles</p> <p>Module2 Doors and Windows</p> <p>(1) Door types- hinged, sliding, folding and revolving.(2) Window types. (3) Doors and Windows selection criteria- emphasis</p> <p>Module 3 Staircases</p> <p>(1) Geometrical Stairs-spiral, elliptical.(2) Open riser, Pressed steel, reinforced in-situ concrete (3) Pre-cast and stone stairways and details.</p> <p>Module 4: Glass</p> <p>(1) Properties, manufacture, types.(2) Glass products, work on glass.(3) Roof light.(4) Glass as roofing materials(4) Glass as flooring and acoustic materials.</p>	<p>(i) Doors and Windows(included)</p> <p>(ii) Staircases(included)</p>	<p>Concrete and Glass(emphasized)</p>
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The following were identified as contributing factors to gaps between the overt and operational-taught curriculum:

- **teachers' subjective instructional approach:** overt curriculum to individual beliefs and interpretation; based on experiences from different academic and field of practice backgrounds
- **individual teaching styles:** due to possibly the way the lecturers were also taught the same way;
- **Acute availability or Scarceness of Relevant Academic Text Books in the Circulation:** possibly due innovations in new editions of texts and book reviews to meet the contemporary needs; differential factors (DF) was discovered in ARC315, possibly because of lack of materials to explain 'three –moment theorem, and application to continuous beams'
- **Lack of economic incentives**

5 DISCUSSION

The intended curriculum refers to such policy tools as curriculum standards, frameworks, or guidelines that outline the curriculum teachers are expected to deliver. The enacted curriculum refers to the actual curricular content that students engage in the classroom [9]. Due to different philosophy in the school, the policy tools also vary significantly across schools of architecture possibly. Apart from the handbook and course compact, teachers are probably the most important respondents, because they make the ultimate decisions about the content taught to students, time or credit hours, and standards of achievement. Curriculum policies, if they are to have the intended effect, must influence teachers' content decisions. The period of instruction used by the teachers is long i.e. in a semester, therefore, the written (intended) needs to be aligned with the taught (operational enacted). This can be achieved by constant monitoring and evaluation strategies where adequate attention would be paid to what is intended in the school's handbook and compared with what is practiced in the class (enacted).

In between the intended and the enacted curriculum, assessed curriculum can be evaluated since a good measure of course outlines would have been covered by the teachers almost a little time above

the mid-semester. Therefore, high-stakes tests could be conducted in terms of what is popularly known as mid-semester tests. At this point, the teachers would be able to know the volume of contents that were assimilated and compared it with the grades scores obtained from the students achievement scores.

6 CONCLUSION

The intended curriculum refers to such policy tools as curriculum standards, frameworks, or guidelines that outline the curriculum teachers are expected to deliver. The enacted curriculum on the other hand, refers to the actual curricular content that students engage in the classroom [9]. Therefore, this study evaluated the gap between overt (intended) and operational (enacted) curriculum in architectural education in Covenant University. The paper identified gaps in curriculum due to different philosophy in terms of teachers' subjective instructional approach, individual teaching styles and acute availability of relevant academic text books. Apart from the handbook and course compact, teachers are probably the most important respondents, because they make the ultimate decisions about the content taught to students, time or credit hours, and standards of achievement. Therefore, if the intended curriculum is to have the desired impact on training of future professionals and consequently on practice the taught curriculum policies must influence teachers' decisions on content. The period of instruction used by the teachers is long i.e. in a semester, therefore, the written (intended) needs to be aligned with the taught (operational enacted). This can be achieved by constant monitoring and evaluation strategies where adequate attention would be paid to what is intended in the school's handbook and compared with what is practiced in the class (enacted).

REFERENCES

- [1] Davis E. A. and Krajcik J. S. (2005). Designing educative materials to promote teacher learning. *American Educational Research Association*, 34(4), pp. 3-14.
- [2] Remillard J. T. (2005). Examining key concepts in research on teachers' use of mathematics curricula. *Review of Educational Research*, 75(2), pp. 211-246.
- [3] Sherin M. G. and Drake C. (2009). Curriculum strategy framework: Identifying patterns in teachers' use of a reform-based elementary mathematics curriculum. *Journal of Curriculum Studies*, 41(4), pp. 467-500 doi: 10.1080/0022027080269115
- [4] O'Donnell C. L. (2008). Defining, Conceptualizing and Measuring Fidelity of Implementation and its Relationships to outcomes in K-12 Curriculum Intervention Research. *Review of Educational Research*, 78(1), pp. 33-84.
- [5] Fraser S. P. and Bosanquet (2006). The curriculum? That's just a unit outline, isn't it? *Studies in Higher Education*, 31(3), pp. 269-284.
- [6] Komoski P. K. (1977). Instructional materials will not improve until we change the system. *Educational Leadership*, 42, pp. 31-37.
- [7] Nicol C. C. and Crespo S. M. (2006). Learning to teach with mathematics textbooks: How pre-service teachers interpret and use curriculum materials. *Educational Studies in Mathematics* 62(3), pp. 331-355.
- [8] Collopy, R. (2003). Curriculum materials as a professional development tool: How a mathematics textbook affected two teachers' learning. *Elementary School Journal* 103(3), pp. 287-311.
- [9] Porter, A. C. and Smithson, J. L. (2001). *Defining, Developing, and Using Curriculum Indicators*; Consortium for Policy Research in Education University of Pennsylvania Graduate School of Education, CPRE Research Report Series RR-048; pp.2-3.