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The passport, an integrated undergraduate studio-based architectural-design learning, teaching and assessment instrument

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KEYWORDS: studio-based, student-centred, problem-based learning, assessment instrument

ABSTRACT

This paper presents a learning, teaching and assessment instrument for undergraduate architectural studio instruction, developed in the Department of Architectural Technology of the Cape Peninsula University of Technology (CPUT), Cape Town, South Africa.

It explains a rational approach to architectural education, which is studio-, project-, process- and problem-based (Ellmers & Foley, 2007; Skinner, 2002; De la Harpe, Peterson, Frankham, Zehner, Neale, Musgrave & McDermott, 2009) and involves complex learning activities (Van Merriënboer, 1997). Students' dedicated and active participation is required to gain maximum learning benefit by developing a design proposal in response to a given project brief.

This graphic instrument (Morkel & Voulgarelis, 2009) maps and manages the pragmatic constructivist didactic methodology by which it is underpinned by monitoring student participation and progress, facilitating assessment and enhancing student learning. It is called a "passport", as without it there is no entry into the portfolio examination.

The passport developed over time in response to a range of challenges presented in the undergraduate architectural studio. The authors aim to explain its value, application and relevance in terms of the prominent studio instructional themes identified in recent literature.

I. INTRODUCTION

The pedagogical approach at the Department of Architectural Technology at the CPUT revolves around project-based learning, which is student-centred. A team of lecturers would each be allocated a group of between 15 to 18 students per project. Student/lecturer interaction occurs in various formats, ranging from group to individual face-to-face crits, mostly sit-down, but often pin-up presentations.

The design process is considered to be as important as the end result (Oztürk & Türkkan, 2006:96; De la Harpe, *et al.*, 2009). The teaching philosophy relies on the principles of mastering and portfolio building.

Marks are therefore not awarded to individual projects. Instead, the student receives an indication of whether a project provides evidence of the "minimum outcomes achieved", or "minimum outcomes not yet achieved". This provides the student with the opportunity to improve work up to the portfolio assessment (at midyear and year-end), at which stage the full complement of projects completed at the time of portfolio assessment is awarded a combined mark.

II. RATIONALE

The passport was born from the need for an integrated "road map" (Kuhn, 2001:351) that would graphically display all aspects of a student's participation and learning relating to a particular studio-based design project. The increasing need to monitor students is the result of worsening staff-to-student ratios and diminishing readiness of students for tertiary study.

To keep track of students' progress from one crit session to the next, lecturers in the past individually recorded their students' progress and, if necessary, the relevant lecturer feedback to which the student was expected to respond to by the next crit event. Individual lecturers employed different methods to record student progress, ranging from memorising to random recording, none of which presented easy to access records at a later stage.

Especially during assessment opportunities (portfolio exams), lecturers who had not been involved with a specific student, as well as the external examiners and moderators, found it difficult to assess the final outcome, the students' participation, and the design process followed.

In the past, the project brief contained a detailed programme that mapped the project in terms of the full range of contact opportunities, and stated what specific outputs students should prepare and present at the various crits and discussions. The assessment criteria were listed in the project brief document. Assessment and feedback were recorded separately, with comments written directly on the individual project work sheets.

An integrated and graphically explicit instrument was needed. A project-specific matrix that would incorporate all the above components was designed to better guide the learning, teaching and assessment processes. In the period 2007 – 2009 the passport design and application developed in an organic fashion in direct intuitive response to the practical results achieved in the studio.

III. STUDIO LEARNING ENVIRONMENT

There is consensus about the fact that the studio is seen to be central to architectural education (Bakarman, 2003, 2005). Sarah Kuhn (2001:349) provides a comprehensive description of the architecture studio: “Characteristics of the architecture studio include: project-based work on complex and open-ended problems, very rapid iteration of design solutions, frequent formal and informal critique, consideration of a heterogeneous range of issues, the use of precedent and thinking about the whole, the creative use of constraints, and the central importance of design media.” She suggests that the concept of a studio, originally developed for design teaching, is now providing a teaching model appropriate to diverse subject fields. The studio “offers us a teaching model from a design discipline in which the functional and the structural, the social and the technical must be successfully blended” (Kuhn, 2001:349).

However, opinions vary on the didactic approach to the process of facilitation by the lecturer or tutor, and the understanding of the structuring of the studio experience. One school of thought is that the design process is an intuitive one: outcomes-based but not process-driven, and that the focus on project outcomes in favour of the design process undermines the valuable learning opportunities offered by the design process itself (Ellmers & Foley, 2007). However, the Department of Architectural Technology at the CPUT advocates a rational, pragmatic and systematic approach to design education. This approach is particularly appropriate at undergraduate level, and has proven successful in ensuring the required throughput rates. Authors who support this approach are Skinner (2002) and Gross and Do (1997), who suggest that it is, however, rather uncommon to find a lecturer who teaches students a systematic method.

IV. EDUCATIONAL RELEVANCE

The use and value of the application of the passport resonates in the available recent literature in the field of instructional design.

Below follows a description of the passport in terms of its three main achievements, namely encouraging student participation (A), guiding the learning process (B), and facilitating assessment (C), relating to three main zones of information located on the passport document (see fig. 1).

For each of these applications, the available literature that underscores the relevance of each is indicated, highlighting the most prominent themes that emerged from the literature.

A. Encouraging student participation

A passport (one A3-page, landscape-format, hard-copy document) is issued to students with every project brief. The title contains the project name and provides space for the student to add his/her name. This document belongs to the student, who must bring it along to every crit session and discussion and present it with his/her work when it is assessed. Students consider it an important document that reflects their unique learning journey and puts them at the centre of their learning. It consequently gives them a sense of ownership of and responsibility towards the design and learning process.

The literature researched refers as follows to the issue of encouraging student participation:

Ownership

Ellmers and Foley (2007:1) argue for “greater responsibility” and “ownership of their learning” in order for students to take charge of their individual learning.

Student-centred

At the National Forum on Studio Teaching (2007), the questions that were raised on how to maintain student engagement and how to administer the instruction of individualism featured rather prominently. Lea, Stephenson and Troy (2003:322) list seven requirements for such learning, of which one is “an increased sense of autonomy in the learner”.

Some authors view student-centred learning as the student’s choice in his or her education; others describe the shift in the power relationship between student and teacher: a move towards active rather than passive learning.

B. Guiding the learning process

The main body of the passport represents the “learning journey” of the particular student. It contains a list of dates when student/lecturer interactions are scheduled to take place. The relevant activities that the student should engage in and the work produced prior to such occasions of interaction are listed. Next to each such date is a space where the allocated lecturer writes comments in response to the work that the student produced in preparation for the relevant crit session.

This takes the form of short sentences, keywords and diagrams. The written feedback generally contains a response to the work produced, as well as pointers and suggestions to the student for further expected work. This part captures the dialogue between the student and the design lecturer.

The design process is divided into manageable tasks, which are organised in a particular sequence. The lecturer signs next to the comments in order to confirm that the interaction with the student took place and that the student came prepared to, and participated in the discussions. The student may add to the written lecturer’s comments as part of the process of self-reflection.

The following themes on guiding the learning process resonate in the literature studied:

Communication

The studio is a social environment (Gross, 1997) which is characterised by communication, critique and collaboration. Van Merriënboer, Kirschner and Kester (2003:4) list “cue cards, checklists and process worksheets” among the “cognitive strategies” used as part of the “coaching” process and providing student support.

Continuity

Andri Yatmo and Atmodiwirjo (2007:2) presented a case study at the University of Indonesia where students had to demonstrate continuity and consistency of thinking. According to Bakarman (2003:1), architecture is a “cumulative process where students get to master design skills and acquire the needed professional knowledge over a long period of time, therefore continuity is an essential characteristic of this type of education”.

Structured manageable tasks

Kuhn (2001:351) writes that, “in order to navigate an open-ended and complex problem” students need some guidance from their lecturers/tutors. Bakarman’s (2000) Architectural Learning Tool (ALT) deconstructs the design process into a sequence of events by separating design activities. He also expresses the need to “track the idea’s development from the generation stage until the final one” (Bakarman, 2000:2). John Zeissel (1981) suggests that the principles of teaching the process of ideas development might be defined in four (chronological) phases.

Kester, Kirschner, Van Merriënboer and Bäumer (2001:2) introduce the concept of just-in-time information (JTI) in order to effectively control cognitive load and to make a daunting task less intimidating. They also present the concept of simple to complex task sequencing. Andri Yatmo and Atmodiwirjo (2007) encourage individual strategies followed by students, while still meeting certain prescribed milestones (2007:1).

Reflection on action

The National Forum on Studio Teaching (2007) acknowledges the fact that evidence must be given of a student’s thinking and resultant learning. The process of learning associated with the studio environment is through continuous reflection (Mitchell, 2006). Andri Yatmo and Atmodiwirjo (2007:4) refer to the principles of “self-reflection and self awareness”. Barbara de la Harpe (De la Harpe, *et al.*, 2009) explains reflection on action as a vehicle for learning. Helena Webster’s paper (2001) looks at the way that reflection might be promoted by the way learning is organised in the design studio, specifically through the design diary. Schön’s prominent work on the reflective practitioner (1983) and the design studio (1985) supports this thinking.

C. Facilitating assessment

Andri Yatmo and Atmodiwirjo (2007:1) promote assessment throughout the duration of the project and not

only at the end. Although the ultimate mark is awarded only at the portfolio assessment, the passport provides evidence of a student’s participation in the studio and his or her involvement and achievements at various milestone events on the learning journey towards producing the final (design proposal) product.

Every project for each student that is presented for assessment must be accompanied by the relevant project passport. It provides the necessary information to enable the examiners to assess the end product as well as the process (De la Harpe, *et al.*, 2009), and to consider the degree of involvement of the student. The passport contains a list of submission requirements that provides a checklist to establish the completeness of the project submission. A list of required project outcomes provides a guide for assessment. Space is allowed for the examiners to tick off against the list of work required, as well as the expected outcomes. Comments may be added in the spaces provided. Finally, a tick is made to indicate whether the project provides evidence of the minimum outcomes having been achieved or not yet. Those competencies that the student has not yet mastered are consequently identified for the student to focus on in his or her preparation for the portfolio exam.

After the project assessment and until the portfolio examinations (there are two, one in June and the other in November) the student has time to improve his or her work. The passport remains a reflection of the student’s participation and learning and the achievement at the point of project submission. At the portfolio exams, the projects to date, each accompanied by the relevant project passport, are assessed as a whole and a single overall portfolio mark is awarded.

Literature that resonates the relevance of the issues relating to assessment addressed in the passport includes the following:

Transparency

The studio teaching model generally relies on subjective judgement and therefore requires transparent methods to ensure accountability (Skinner, 2002). In the absence of such transparency, the learning process can be seriously compromised.

Holistic approach

Bakarman (2005) presents the ASK model for assessment, which considers attitude, skill and knowledge. He refers to these as themes (Bakarman, 2003) and argues that, in order for the lecturer to assess the design process, the student should be monitored during this process. However, he does not present any specific methodology for this. De la Harpe (De la Harpe, *et al.*, 2009) suggests that a holistic model for assessment should incorporate the product, the process and the person.

The three elements that the passport consists of (see components A, B and C in figure 1) represent exactly these three aspects, where C represents the product, B the process and A the person.

V. CONCLUSION

The passport was presented to the Faculty of Informatics and Design at the CPUT (Morkel & Voulgarelis, 2009) and has subsequently been adapted for use in a number of CPUT departments other than Architectural Technology, where it was developed. The authors received positive feedback from their colleagues in the Interior Design department and a number of other departments where the passport is already being employed, and with good results.

Its value in terms of providing an integrated undergraduate studio-based design learning, teaching and assessment instrument to encourage student participation, guide the learning process and facilitate assessment, is being recognised.

The authors would appreciate comments and feedback from a wider audience, including lecturers and students, in order to further improve and develop this useful learning, teaching and assessment instrument.

An online format version of the passport is currently being investigated.

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DEPARTMENT OF ARCHITECTURAL TECHNOLOGY PRINCIPLES OF ARCHITECTURAL DESIGN			
Project 1: A COMMUNITY HUB PASSPORT			student name
PARTICIPATION			
dates	tasks/ bring along	lecturer feedback/ student reflection	signature
Mon 1 Feb	Introduction to the subject & briefing Case study Interact on the blog		A
Wed 3 Feb	Pin up ps1: anthropometrics and function Bring completed case study Interact on the blog		
Mon 6 Feb	Pin up ps2: precedents and first idea: working model 1 Interact on the blog		
Wed 10 Feb	Bring sketches and diagrams and working model 2 (to an appropriate scale) showing the idea development. Interact on the blog		
Mon 13 Feb	Bring working model 3 (to an appropriate scale) clearly showing the idea of the technological/ structural system. Interact on the blog		
Wed 17 Feb	Pin up ps3: technology Interact on the blog		
Mon 20 Feb	Bring working model 4, clearly showing the structure and connections. Interact on the blog		
Wed 24 Feb	Final crit. Bring further developmental sketches at a scale of 1:50 including plans, elevations and sections. Interact on the blog		
Mon 1 Mar at 10:00	Submit the following for assessment: final model + all working models + (labelled and explained) plan/s + spaces, structure and materials should be clear all elevations + (at least one rendered elevation) spaces, structure and materials should be clear / two sections + (at least one rendered section) spaces, structure and materials should be clear / process drawings and/ or diagrams/ sketches + (labelled and with short descriptions) and reference to relevant precedent studies + an understanding of TECHNOLOGY and FUNCTION and the influence that technology and function can have on the form of the final design and detail resolution develop an understanding of DESIGN GENERATORS an awareness of ARCHITECTURAL LANGUAGE evidence of RESEARCH and information gathering techniques appropriate graphic and model building COMMUNICATION TECHNIQUES		B
MINIMUM project outcomes/ assessment criteria			
MINIMUM PROJECT OUTCOMES ACHIEVED		MINIMUM PROJECT OUTCOMES NOT YET ACHIEVED	

Fig.1. The passport with zones of information labelled A, B, C for discussion