The Making of an Architectural Student: Physical Models and the Question of Scale in the Digital Condition.

The term physical model frames an artefact with a broad spectrum of different uses and interpretations throughout the histories of architecture. In it, physical models have been, at first instance, an artefact for producing architectural knowledge, so central in architectural education and practice.

Nevertheless, a characteristic of the 21st century for architectural knowledge is the engagement with contemporary challenges, such as the production and availability of new technologies. Over time, for example, the use of computers in architecture has allowed architecture students and architects to develop scripts and generate spectacular geometries and forms to be 3D-printed. Architectural models, as a product of omnipotent computers and 3D-printing machines, have made specific aspects of architectural knowledge inaccessible, such as the notion of scale lost with the ‘zoom in and zoom out’ gesture.

Drawing on the idea of physical models as a possible harbinger of architectural knowledge, this paper empirically explores the notion of scale through the physical and digital architectural model-making of 12 students at the Bristol School of Architecture and Environment. In bringing together physical and digital architectural model-making techniques, architectural knowledge becomes a method concerned with the notion of scale built around an acknowledgement of a conscious continuity between digital and physical domains whilst rejecting modernist dualisms. Thus, the question of architectural education and practice is on the agenda again.

Keywords: Architectural Education, Models, Scale, Design Process, Digital Turn.

Extended Abstract

Historically, a dualist relationship characterised practical and theoretical knowledge. The former type of knowledge, peculiar to practitioners such as craftsmen, has been underpinned by a circular process of trial and error to generate practical solutions to practical problems. The latter type of knowledge, instead, which has been peculiar to theoreticians such as scientists, has provided intellectual solutions to practical problems.[i] Over time, scientific achievements such as coal-fuelled industries of the seventeenth and eighteenth centuries had economic, spatial, social and professional implications. Inevitably, they emphasised the professional division between practitioners and theoreticians, thereby fragmented knowledge production.[ii] In this, theoretical knowledge and its holders were the victors over practical knowledge and its holders.[iii] Although, models have had the capacity to mediate between practical and theoretical knowledge, in other words, producing diverse knowledge. In Western histories, the term 'model' was borrowed from the Vulgar Latin *modellus* and *modus*, the Italian *modello*, and the middle French *modèle*. It is related to the term 'manner', meaning the nature of a thing.[iv] This compounds the fact that the term 'model' has been used to describe a mould, a hollow container of either practical and/or theoretical knowledge. Thus, models have functioned as demonstration tools against a strict distinction between different disciplines, professions and their people, such as scientists and the public at large, as well as instructors and students.[v]

Specifically, models have played a central role in architecture as a discipline and profession. Of the variety of definitions, types (e.g. what the model was made for, what the model was made of, and how the model engaged with time) and categories associated with the term 'model', the French term *maquette* is what this article refers to as the architectural model. Therefore, the architectural model is a demonstration foreshadowing almost prophetically the process and the general appearance or composition of a thing planned.[vi] In it, architectural

models are a way to investigate the nature and the chaos of the thing planned, thereby a way of producing diverse architectural knowledge.[vii] The aspect of architectural knowledge that this article focuses on, instead, is scale. In Western histories, the term 'scale' has alluded to an organisational framework, which facilitates the comprehension of the world and human activities (e.g. the nation scale, the community scale, and the household scale).[viii] As models, the term 'scale' has had multiple definitions in architecture as discipline and profession. The 'scale', in this article, is the organisational framework that defines a system of relationship between a natural/non-natural space, and a human/non-human body. It is a relative rather than absolute organisational framework providing measurements.[ix] Scale refers to an element being relationally smaller or bigger than another element and, as a result, is qualitative. The scale, however, is not to be confused with size. Specifically, size is the direct measurement of a component and is therefore quantitative in nature (e.g. How many? or how much?).[x]

Today, contemporary cultures have posed profoundly different challenges.[xi] One such culture is the 'digital culture'. In this article, the term 'digital culture' is used in its broadest sense to refer to the turn in the production and availability of any new technologies, their related phenomena and their impact on lifestyles.[xii] Whereas this has redefined the nature of human beings and their everyday life, the 'digital culture' has renewed the availability of work and education.[xiii] As a consequence, this has redefined architecture as a discipline and a profession. The use of computers in architecture, for example, has had an evolutionary process. While they started as drawing, and 3D digital model-making machines, they are, nowadays, programming machines which allow architects and students of architecture to develop their scripts and generate spectacular geometries and forms to be 3D printed. They offer a diverse set of tools and access to techniques for the architects and students of architecture from the past, thereby

redefining the production of architectural knowledge in practice and pedagogy. The scale, for instance, is lost with the ‘zoom in and zoom out’ gesture, whilst architects and students of architecture focus on a specific portion of the 3D digital model and, thereby, the architectural project that simplifies this complexity of the nature and its chaos of the thing planned.[xiv]

Whilst initially both terms – models and scales – and their concepts had little, if nothing to do with architecture, this exploratory article examines models, specifically digital-physical models, and their making as a ubiquitous harbinger of diverse knowledge, specifically the scale, in architecture as a discipline and a profession regardless the advent of the ‘digital culture’. In this ‘terrifying moment’ of new technologies production and availability, the article claims back a self-conscious continuity of the students of architecture and, thereby, architects. The self-conscious continuity acknowledges an impossible pragmatic differentiation between physical and digital domains, flesh and machines, and practical and theoretical knowledge to reveal and orient related thresholds.[xv] And if the self-conscious continuity would in some way reject deterministic, prescriptive, functionalist and dualistic compartmentalisation and conventions, then the production of diverse architectural knowledge, specifically the scale, through models, specifically digital-physical models, and their making has something in common with the pre-modern and pre-digital culture as it currently exists. But underlying these prefatory remarks is a reciprocal critical role of both students of architecture and, thereby, architects and models and their making in an active – subjective rather than passive – prescriptive/standardised production of diverse architectural knowledge.

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