

Kabin: Material Negotiation at Extra-Small Scale

Utku Coşkun, Çağrı Koçer

TED University, Faculty of Architecture and Design

Keywords

Research-by-Design; Digital fabrication; Self-Production; Spatial and Material Constraint; Hands-on pedagogy

ScaleKabin is a 1:1 mobile fabrication hub, collectively designed and built by architecture students in an elective course. The project began from a concrete spatial problem: a crowded studio with newly acquired 3D printers and no space to house them. This made mobility a design parameter and positioned material and spatial limitation as the primary condition for research. Students surveyed university storage spaces and assembled a stock of salvaged structural and sheet components, each with its own dimensions and tolerances.

Formal and tectonic decisions were worked out against these properties, in workshops where making and thinking proceeded as a single, retrospective operation. Digital fabrication entered this same negotiation and produced custom-fitted joinery, tested and revised on site.

At extra-small scale, the tolerances of the salvaged material and the precision of the digital tools were measured in millimetres, so misalignments had to be caught and corrected by hand. Decisions were revised throughout construction through direct bodily engagement with material behaviour: joints were tested, failed, and rebuilt until they held. Practical knowledge accumulated through this repeated cycle of testing and adjustment, and is articulated here through a design research folio and a survey of participating students that documents material quantities and design reasoning.

This account follows a research-by-design method, in which knowledge is drawn retrospectively from the act of making rather than tested against a prior hypothesis. Framed this way, Kabin shows how material and spatial limitation can structure a coherent architectural process in which construction itself becomes a site of knowledge production.