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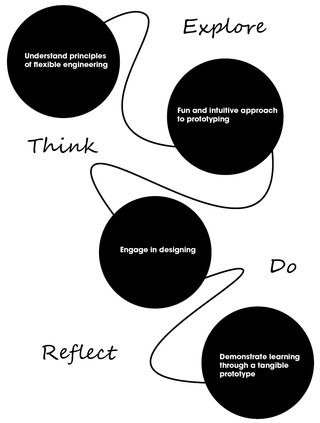
An intuitive approach to design products based on *flexibility*

The principles of compliant mechanisms have been available to engineering students, students of mechanical engineering. Designers or design students had very little understanding of the principles behind making compliant things[Interviews].

Through the course of this project, the relevance of compliant products to designers have been outlined. The basic general principles have been outlined and an introductory workshop experience has been curated using a worksheet as a tool to guide designers in their learning journey and in helping them design their first ever compliant thing. The concept has been validated on two occasions with two user groups, one on the university level and the other on a professional level.

With the emergence of 3D printing as a manufacturing technology for prototyping needs of a designer, the FDM 3D printing technology is used in attaining the results of the workshop.

To direct the project, values of two stakeholders were considered. First, the IDE Academy, TUDelft. Second a mock business entity, Borderless Quadrant. Through these values, mechanics of the workshop such as experiential learning, conversational learning have been shaped.



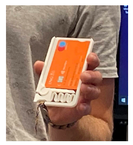
The methodological approach of the project is based on the double diamond approach and has explore, define, develop and deliver phases.

During the exploration phase of the project, literature research coupled with interviews with subject matter experts w conducted. The challenges faced by product developers while designing compliant products were outlined. The current delivery of an IDE academy workshop was observed and points for improvement were noted down.

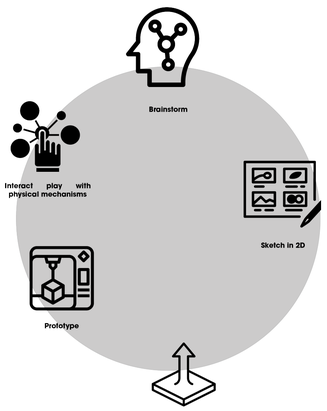
The literature research aided in formulating the basics of designing with flexibility of products.

Going into the "define" phase of the project a vision was formulated i.e **"The vision is to encourage play and exploration in the learning journey to get to simple, functional, tangible outcomes"** .

Based on this vision, a co-creation workshop was set up with a small group of designers. The learnings from this were translated as guidelines for designers. The next step was to validate these guidelines through a workshop for design students that was organised by the IDE academy. For this workshop the complexity was to deal with the higher number of participants and time. In providing the participants a consistent learning experience, worksheets based on the guidelines were made. The workshop was successful in introducing this new concept to designers, in contextualizing the relevance of designing with flexibility for them, and helped them in autonomously achieving results on the topic. The next step was to validate it with professional designers and so the workshop was conducted in a design studio. After the workshop, inputs were welcomed in making it more valuable to designers in actually being able to take this skill and apply it to their design practice.



"Seeing that designing and printing your own product in just a couple of hours can actually give you a working product, also the experience how complex mechanisms could be translated into something simple, made from one piece was really new to me" - Design student

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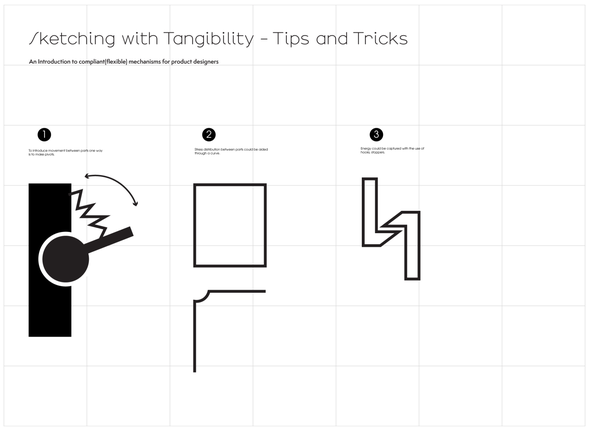
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An Introduction to compliant(flexible) mechanisms for product designers

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