

My Dear Monster Friends

Matrix as an Emotionally Rich Generative Design Tool

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Abstract: This paper focuses on the means of integrating emotionally rich associations into the idea generation phase of the design process. Matrix, a generative and evolving design tool developed at METU Department of Industrial Design has been further explored as an emotionally rich idea generation tool in an educational context. The revised exercise has developed into a motivating tool particularly suitable for team creativity, improvisation and co-creation. The outcome also suggested that emotionally rich project themes such as “my dear monster friends” encouraged the generation of more interaction-based design ideas.

Key words: *Idea generation, emotionally rich generative design tool, matrix, design education.*

1. Introduction

Emotion-based associations play a critical role for developing and expressing novel associations between two distant concepts. There seems to be a close link between emotion-based associations and creative problem solving [1]. This has significant implications for incorporating emotionally rich associations into the design process and generative design tools. Matrix, a generative and evolving design tool introduced at the Middle East Technical University (METU) Department of Industrial Design in 2003, has been further developed as an emotionally rich idea generation tool and integrated into an industrial design studio project at the third year undergraduate level. Matrix has two main components, project dimensions and project themes. This paper particularly focuses on the project themes which are expressions encouraging emotionally rich associations in relation to potential solution areas.

The paper describes the framework of this educational project, discusses the considerations on how to generate project themes motivating emotionally rich associations during the idea generation phase, and the shifting role of design educators within the process. The paper offers an overall interpretation of matrix as a generative design tool, and discusses its outcomes together with its implications for the idea generation phase in an educational context.

2. Project Brief and Project Phases

A third year industrial design studio project titled as “Sustainable Solutions for Kids: Creating a Space of Their Own” was undertaken in the fall semester of 2009. The aim of the project was to develop design solutions for preschool children between three and six years old, which embody their privacy and space needs, help children co-create a space of their own, and foster creativity, participation and interaction. The teaching goals of the project were to incorporate product-user interaction, to improve modelling and user research skills, and to integrate the notion of sustainability into the design process. The project was completed in seven weeks with 31 students and divided into the following phases.

Design research (literature search and field observation) (team work): The literature search helped students explore various research topics. In addition to this, the students conducted field observations at daycares and private homes.

Idea generation (team work): Based on the findings and conclusions of the literature search and the field observation, the students generated various project dimensions. Some of these dimensions were further explored through the mood board exercise. These phases set the stage for the idea generation phase which consisted of the matrix exercise and the related assignments.

Preliminary design and user testing (individual work): Each student presented two alternative design solutions and three dimensional mock-ups for the concept development. User testing and observation helped students further refine their design solutions.

Final design: Final presentation included all project deliverables which were evaluated on the basis of the following criteria: a) Interaction, creativity, product personalization and aesthetics; b) motor and social skills, privacy and space needs; c) sustainability, affordability and locality; d) product set-up, human factors and product safety.

Post project phase (optional): This phase aimed at making project outcomes available and accessible to potential user groups at daycares, paediatric departments at hospitals or medical centres, and families in need.

3. Setting the Stage for the Idea Generation Phase

3.1. Literature Search and Field Observation Leading to Project Dimensions

Firstly, the students formed teams of three or four members and conducted literature search on one of the eight topics given below. The topics were determined by the studio tutors in accordance with the educational objectives of the project, and assigned to the teams randomly.

- What is play? (Imaginative play; privacy, space, play environment; setting up a play environment)
- Children between three and six years old (social skills, motor skills, girls and boys)
- Interaction and participation in play (child-child and parent/care giver-child interaction, means of communication with a child, psychodrama)
- Current products and indoor play environments (current products in the market, locally available brands and products, assembly and disassembly, storing and design details)
- Primary materials and applications (paper-based materials and fabrics, locally available materials and samples, manufacturing and surface finishing processes)

- Supplementary materials and applications (volume creating materials –organic and inorganic, structural materials, accessories)
- Sustainability and design (design examples from diverse product sectors –e.g. furniture, electronics, crafts; repair, reuse, recover, recycle; product lifespan)
- Product safety and product recall cases, and anthropometrical data

Secondly, the student teams carried out field observations and interviews on children’s use of play environment in daycares and private homes. They observed the activities carried out, especially the ones related with generating a space through engaging in creative activities and imaginative play, and documented them with still images, video recordings, voice recordings, notes and sketches.

Thirdly, the student teams discussed their major conclusions, findings and insights from the design research phase and generated a pool of project dimensions in the form of adjectives such as “transformable”, “empowering” or “affordable”. Then, each team proposed four dimensions which they found important for the project.

3.2. Mood Boards: Exploration of Project Dimensions

At this stage, the student teams prepared a separate mood board for each dimension they had chosen. The mood board exercise, as indicated in the literature, aimed at providing sources of inspiration and fostering a shared understanding of project dimensions [2]. When preparing the mood boards, the students were instructed to consider the following issues:

- Mood boards are a collection of visual representations (e.g. photographs, sketches, diagrams, illustrations, material samples, etc.) selected and gathered together in a meaningful manner. Brochures, magazines, newspapers and online sources are beneficial material sources for mood boards.
- Mood boards are useful to explore and communicate intangible or abstract emotions or concepts such as calmness, inclusiveness or viability, and helpful in team work to negotiate a shared understanding of the project dimensions.
- There are no prescribed formulae for mood board creation. However, a good balance of “abstract” and “concrete” visuals is considered to be more useful for the idea generation phase.

The project dimensions explored by the student teams in the mood board exercise were as follows: Safe, affordable, imaginative, transformable, connecting, abstract, surprising, reconstructable, compact, sympathetic, reusable, energetic, flexible, private, empowering, naïve and social. Figure 1 shows two examples of the mood board exercise exploring the project dimensions “private” and “energetic”.



Figure.1 The exploration of the project dimensions “private” and “energetic” in the mood board exercise by Gizem Akuz, T. Deniz Erturk, Fulya Pekserbes and Nazlı G. Terzioglu.

4. Idea Generation Phase: The Matrix Exercise

After completing the literature search, field observation and exploration of project dimensions through the mood boards, the students moved on to the next phase, the idea generation. In the idea generation phase the matrix exercise was used as the generative design tool. The aim of the exercise was to generate diverse design ideas based on project themes and project dimensions.

Project dimensions. Considering the project brief, the evaluation criteria and the project dimensions proposed by the student teams, the tutors compiled a list of dimensions and categorized them into five groups as illustrated in Table 1. Grouping the dimensions contributed to the exploration of a wide range of project dimensions.

Table 1. Project dimensions categorized into five groups

Group I	modular, transformable, portable, personalized
Group II	interactive, connecting, private
Group III	impulsive, surprising, sympathetic
Group IV	light, soft, flexible, rugged
Group V	re-usable, empowering (enabling), affordable

Matrix. The student teams chose one dimension from each group and prepared a matrix by placing the project dimensions on the top of each column, and the four project themes (super ground, magical door, my dear monster friends and fun zone) proposed by the tutors on the left of each row as illustrated in Table 2.

Table 2. The matrix formed by project dimensions and project themes

	Dimension I	Dimension II	Dimension III	Dimension IV	Dimension V
Super ground					
Magical door					
My dear monster friends (MMF)					
Fun zone					

The student teams generated design ideas inspired by the project themes and the five dimensions they had chosen, and completed the matrix by placing the ideas in the relevant cells. In order to explore a wide range of solution areas, the student teams were instructed to make sure that there was at least one idea in each cell. At the end of the exercise the teams were expected to develop a matrix with minimum 20 ideas. The size of the matrix was determined on the basis of the number of students per team and the project context.

Project themes. The project themes were phrases or expressions referring to the potential solution areas and covered the critical aspects or components of the expected outcome. The themes were based on familiar and well-known aspects of the project context such as “ground” and “door” coupled with inspirational and open-ended modifiers such as “super”, “magical” or “fun”. This coupling generated incongruous, emotionally strong and inspirational themes for idea generation.

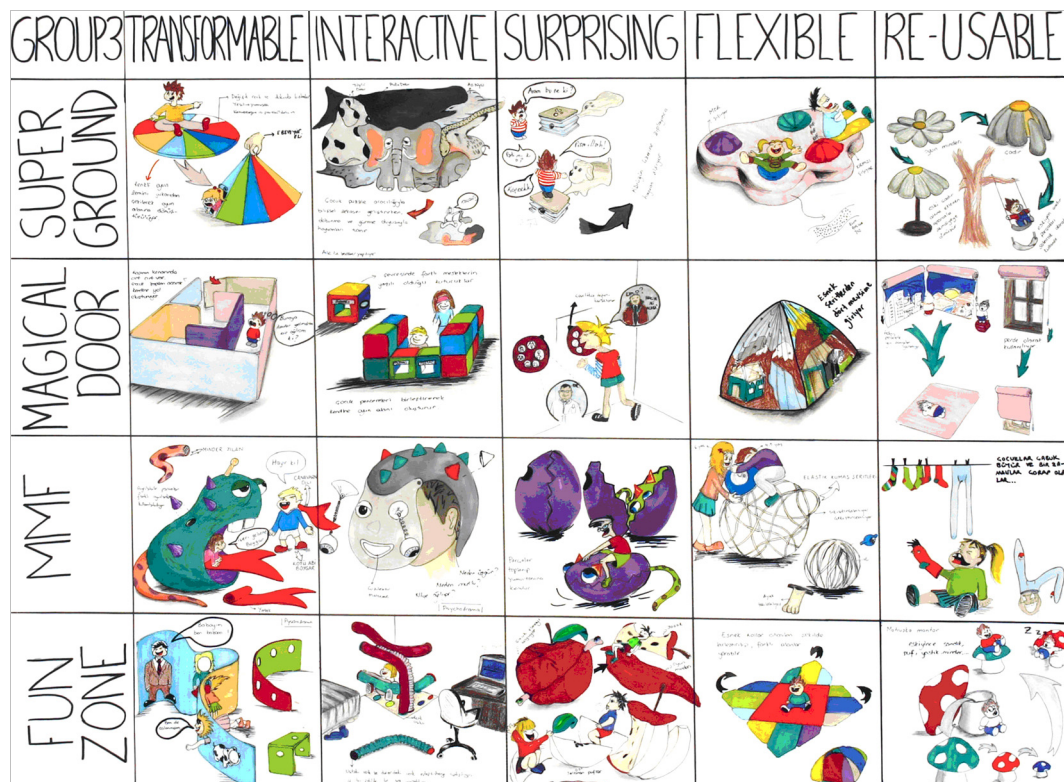


Figure.2 The matrix exercise by Mehtap Aydin, Dilruba Ogur, Yasemin Oral and Togrul Tagizade. The project dimensions selected were transformable, surprising, flexible and re-usable.

GROUP	TRANSFORMABLE	CONNECTING	IMPULSIVE	FLEXIBLE	RE-USABLE
MAGICAL DOOR SUPER GROUND					
MAGICAL DOOR					
MMF					
FUN ZONE					

Figure.3 The matrix exercise by Yasemin Camadan, Merve Ozdemir, Aslihan Tokat and Burak Yesilyurt. The project dimensions selected were transformable, connecting, impulsive, flexible and re-usable.

GROUP 7	TRANSFORMABLE	INTERACTIVE	IMPULSIVE	FLEXIBLE	RE-USABLE
SUPER GROUND					
MAGICAL DOOR					
MY DEAR MONSTER FRIEND					
FUN ZONE					

Figure.4 The matrix exercise by Gizem Akuz, T. Deniz Erturk, Fulya Pekserbes and Nazli G. Terzioglu. The project dimensions selected were transformable, interactive, impulsive, flexible and re-usable.

The outcome of the matrix exercise as exemplified in Figures 2-4 indicated that the project themes, as anticipated, were the main generators of design ideas; the project dimensions, on the other hand, served as particular attributes or characteristics to focus on. The exercise also revealed that the project themes were either more product-based (super ground, magical door and fun zone) or interaction-based (my dear monster friends). The product-based themes implied extraordinary product features evolving from tangible and familiar aspects, whereas the interaction-based themes connoted animated or super characters emphasizing the product-user relationship.

One of the most interesting insights from this exercise was that the theme “my dear monster friends” was distinct in the sense that it consistently resulted in design ideas involving characters with the attributes of living things. It can be said that this project theme in particular, was a source of rich and strong emotion-based associations encouraging a more personalized understanding of the problem area.

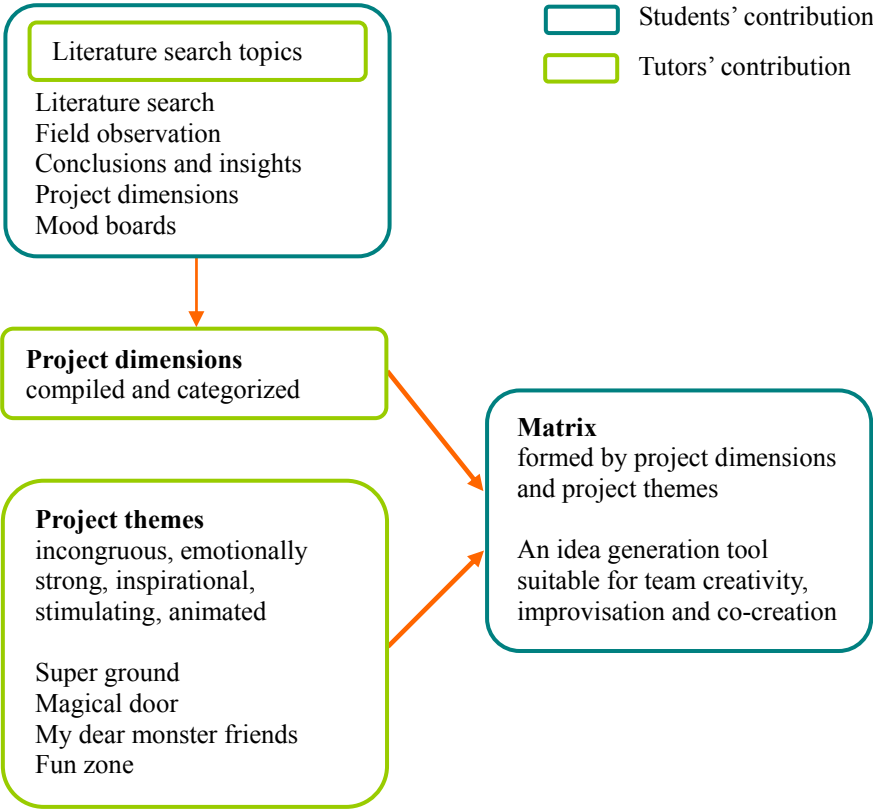


Figure.5 The contribution of students and tutors to the matrix exercise

5. Discussion and Conclusions

Firstly, the project experience has changed the way we conceived and practiced the matrix exercise; it has evolved into a design tool beyond generating diverse and creative ideas. The project brief in this particular case was emotionally strong and rich in nature, which, in turn, positively affected the generation of project themes. The themes involved emotionally rich associations, and encouraged more interaction-based, creative and emotionally rich ideas.

Figure 5 summarizes the contribution of students and tutors to the matrix exercise during the idea generation phase. An important aspect of the process was the role of design educators who acted as creative members of the project team. The two tutors compiled and categorized the project dimensions, and co-developed the project themes, which involved a creative process in themselves. This involvement has been recognized as an engaging and pleasant experience by the tutors.

The research on creativity methods suggests that novice designers typically lack sufficient domain knowledge, which, in turn, results in low levels of creativity [3]; novice designers also have more difficulty in identifying and retrieving relevant information, whereas experts focus on the important features of a problem more easily [4]. In this particular case, the tutors' interventions in the matrix exercise were observed to help balance the students' insufficient domain knowledge and encouraged systematic exploration of diverse solution areas (project themes) in conjunction with the important attributes or characteristics of the expected outcome (project dimensions).

Matrix as an evolving tool can be further enhanced by the contribution and involvement of students in terms of planning and implementing the exercise. The student teams can be encouraged to discuss the project dimensions generated and to propose their own categorizations of them. Similarly, the critical aspects or components of the expected outcome can be openly discussed with the students as part of the process, which may contribute to generating a shared and creative understanding of the project context.

The matrix exercise can certainly be used at the individual level as a personal idea generation tool. However, our experiences show that the matrix exercise is a motivating idea generation tool particularly suitable for team creativity. It allows team members to work on diverse ideas simultaneously, and provides room for improvisation and co-creation.

7. Acknowledgement

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