

Designer s Cognitive Empathy and Emotional Empathy measurement, a need for Comprehensive Understanding of User

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Abstract Empathy is the crux of User centric design. User will be satisfied only when designer is capable of understanding the user needs in-toto. To understand the user completely, designer must have at least average cognitive and emotional empathy. Deficit in any one of the empathy in designer, will make him to empathize the user in wrong way. Thus there is need to test the cognitive empathy and emotional empathy of the designer by using Balanced Emotional Empathy Scale. This test will help to identify the empathy of the designer. Low cognitive and emotional empathy level needs specific training. This paper is focused only on the need for testing cognitive and emotional empathy so that designer will be fortified and overcome his deficit, for comprehensively understanding of the user.

Index Terms Cognitive, Emotional, Empathy, User, User centric design.

I. INTRODUCTION

The needs of user are to be understood meticulously, so that designer can provide robust solution which will satisfy the user. Immersion of the designer with the user will depend on his or her ability to empathize the user. Lawrence et.al. [1] Examined the reliability and validity of the Empathy Quotient (EQ) and determined its factor structure. Fraley [2] commented on Experiences in Close Relationships-Revised (ECR-R) Adult Attachment Questionnaire and its use for conducting empathy test. Mehrabian [3] had given a systematic manual for the balanced emotional empathy scale (BEES). Youssef et.al. [4] Had studied the empathy profile of students during five years of course by using Jefferson Scale of Physician Empathy and the Toronto Empathy Questionnaire. They found that the results are in close proximity with each other. They also understood that affective empathy has reduced during five years of time. Mauraage et.al. [5] Conducted correlational analyses to assess the connection between empathy scores and psychopathological measures. Smith [6] had explained 7 models of empathy and

asserted his hypothesis that model 7 is best amongst other models.

Gasparini [7] [8] explained how empathy can be used in design thinking context. Further analyzed using the results of a large workshop where Design Thinking was used. McDonagh and Thoma [9] had collated many self-explaining illustration, showcasing the product abandonment, supra-functionality aspects in empathy. They involved users in the design team so that they can work as co-creators.

In this paper an attempt has been made to assert need for testing cognitive empathy and emotional empathy of the designer before immersing in the user. These test will help the designer to understand his/her Empathy ability. In case of any deficit, designer can take specific training to overcome. This paper also deals with different empathy models [6]. In my opinion, it is mandatory for designer to test empathy ability to ensure better understanding of the user, and deliver a fortified solution which will satisfy user.

II. INTEGRATING EMOTIONAL EMPATHY (EE) AND COGNITIVE EMPATHY (CE):

The designer must be capable to use CE and EE in an integrated way. Fusing, the two empathic capacities would support each other and encourage social expertise. EE will develop motivation while CE will give the necessary understanding. CE might help manage EE feedback. EE will act as catalyst to initiate the feeling of helping the user and CE could clarify what sort of help is appropriate. EE will make the designer to work for benefit of the society. Integration of EE and CE seems particularly important when interacting with users and team mates. If we consider a hypothetical condition of CE without EE, then the designer can be produce devastating things that will be a threat to society. If designer has only EE, then the solution will not be competent.

III. EMPATHY TEST:

Following is the questionnaire used for measurement of empathy [10] [11].

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Cognitive Empathy

- i. When I am angry or upset at someone, I usually try to imagine what he or she is thinking or feeling.
- ii. I can tell by looking at a person, whether they are happy.
- iii. I really like to watch people open presents, even when I don't get a present myself.
- iv. When I am arguing with my friends about what we are going to do, I think carefully about what they are saying before I decide whose idea is best.
- v. I can tell what mood my parents are in by the look on their faces.
- vi. I notice straight away when something makes my best friend unhappy.
- vii. I can often guess the ending of other people's sentences because I know what they are about to say.
- viii. I often try to understand my friends better by seeing things from their point of view on the phone.
- ix. I can tell if the other person is happy or sad by the tone of their voice.
- x. I often know the ending of movies or books before they have finished.
- xi. I think people can have different opinions on the same thing.
- xii. I can tell by the look on my parent's face whether it's a good time to ask them for something.

Emotional Empathy

- i. Sometimes I cry when I watch TV.
- ii. Some songs make me so sad I feel like crying.
- iii. When I see someone suffering, I feel bad too.
- iv. It upsets me when another person is being shouted at.
- v. When my parents get upset I feel bad.
- vi. When I walk by a needy person I feel like giving them something.
- vii. I get upset when I see an animal being hurt.

The metric for this question is done on five point scale format from I strongly agree – I strongly disagree.

IV. RESULT AND DISCUSSION

Empathy test of First year engineering students has been conducted. The objective of test was to assess the cognitive and emotional empathy capability of the students. This test will help us to know how design thinking students can feel about their user. Empathy assessment has been done for a sample size of 44 students. Students had to put their preference on the scale of 1- 5.

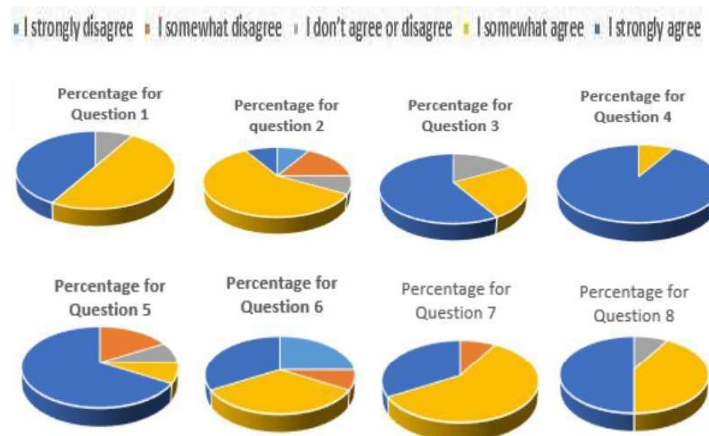
1. Preference analysis

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A detailed analysis of the questionnaire has been done, in which I have calculated the % preference score of question on the scale of 1-5.

i. Cognitive Empathy preference analysis:

It has been observed that for Q.No.1, students have opted for option 4 (50 %) and 5 (41.66 %) equally and few students have opted for option 3. No student have opted for option 1 or 2. Here it seems that students somewhat/strongly agree about the feeling of other when they are angry. For Q. No. 2, 58.33 % students think that they somewhat agree about their guess of people being happy. For Q. No. 3, 58.33 % students have said that they strongly agree to their liking for watching people opening presents even though they don't get presents. 17% students said that they don't disagree or agree. For Q. No. 4, 91.66 % students have shown strong agreement to their capability to think carefully about what they are saying before deciding whose idea is best. Student's preference score for Q. No 5 was 66% for strongly agreement for guessing mood my parents are in by the look on their faces. For Q. No. 6, 33 % students strongly disagreed, 33% were somewhat agree and 33% were in strong agreement to notice straight away when something makes my best friend unhappy. Q. No. 7 60% students preferred to their somewhat agreement about how often they guess the ending of other people's sentences. For Q. No 8, Students are in strong agreement or somewhat agree often try to understand their friends better by seeing things from their point of view on the phone. Q.No.9 has mixed preference, where 33% students have opted for somewhat disagreement, 25% for somewhat agree and 25% for strongly agreement about their guessing of other person is happy or sad by the tone of their voice. 8% students are not capable show their clear inclination to agreement or disagreement. Q. No. 10, 11 and 12, students have comprehensively preferred for strong agreement.



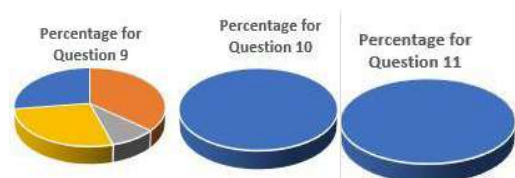


Fig 1. Cognitive empathy pie chart representation of preferences

ii. Emotional Empathy

Fig No 2 shows the pie chart representation of preference given to questions. For Q. No. 1 .36 % students had shown their strong disagreement while 36 % students have expressed their strong agreement. From this it is observed that half of the students are not that emotional about what is happening on screen. They can keep themselves out of it and are aware that the situation is fictitious. For Q. No 2. Majority of students are having either strong agreement or in somewhat agreement about getting sad by listening to emotional songs. Students have shown strong agreement for Q. No. 3, about feeling bad when they see someone suffering. For Q. No 4, 63% students have shown somewhat agreement, while 34% students don't agree or disagree. All students showed their strong agreement for Q. No. 5.

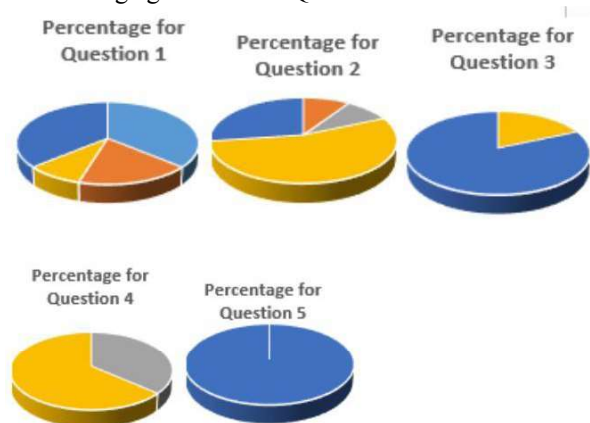


Fig.no 2: The pie chart representation of preference given to questions of Emotional empathy

2. Students Cognitive Empathy and Emotional Empathy analysis:

Empathy test has been conducted to assess the capability of students to empathize. Questionnaire consists of questions which will help to find out students approach and perspective. The questionnaire has been divided into two sections viz: Cognitive Empathy and Emotional Empathy.

It is observed that the cognitive and emotional empathy score of majority of students is between 60-80 %. This means that students have very high ability for understanding how other people feel and responding appropriately. From the test result it is also seen that

Maximum number of students have cognitive score more as compared to emotional empathy score. 80% students have Emotional empathy score between 60-80% while 20 % Students have emotional empathy score between 40-60%.

As the Cognitive score and Emotional empathy score of majority of the students is between 60-80%, the brain of students can be classified as balanced brain. No student is having exclusively male or female brain.

From Fig .no. 3 it is seen that average Emotional empathy score of girls is 88% as compared 70 % of boys. This shows girls are emotional as compared to boys. Fig no 4 shows the bar chart of Cognitive Empathy of girls and boys. It is observed that girls have cognitive empathy score of 86 %, while boys are having cognitive empathy score of 82%.

Here we can say that girls and boys have good cognitive empathy capability. It is observed that, 20 % of the student have average empathy ranging from 50-60 %.

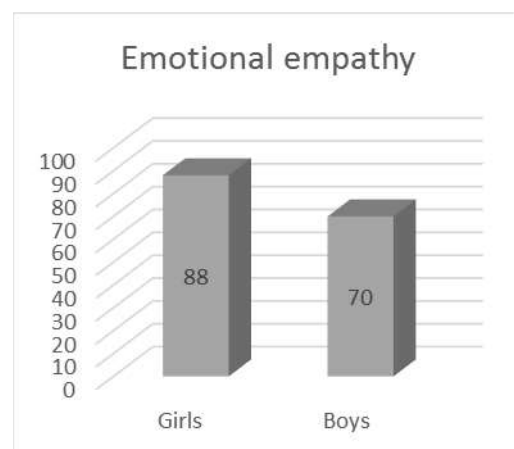


Fig 3 : Average Emotional empathy score

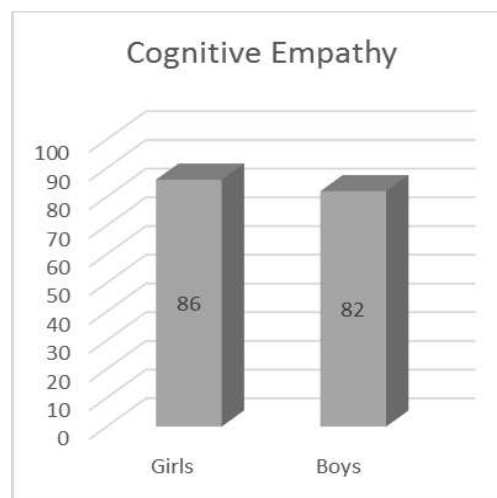


Fig 4: Cognitive Empathy Score

V. EMPATHY TRAINING

After conducting empathy test for assessment of Cognitive empathy and Emotional empathy of students participating for Design Thinking course, Empathy training becomes essential for students having less empathy score. This test will help the instructor to diagnose the deficiency of student in cognitive /emotional /both cognitive-emotional empathy.

Empathy training consists of four modules viz: Self-Empathy, Accepting others, Accurate Listening and Perspective taking [13]. Self-Empathy emphasis on becoming cautious about inner mental and physical events without judging. Developing Self empathy with increase the emotional quotient. Accepting others focuses on developing the skill on observing others without judging them and acknowledge others as self-determining individual.

Students who have less emotional empathy can be trained exclusively in first three modules viz: Self-Empathy, Accepting others and Accurate Listening. As these modules will train the individual to know himself, knowing others and listening to others without judging them. Whereas students deficient in Cognitive empathy can be trained in last module i.e. Perspective taking. In this module student will be made aware that others have their own perspective and way of thinking.

VI. CONCLUSION:

In this paper an attempt has been made to test the cognitive empathy and emotional empathy of designer. Through this test designer can find his cognitive and emotional empathy. If there is any deficit in either off, designer can take specific training. This will help the designer to understand his/her user comprehensively and deliver solution to the user's problem. This will increase the satisfactory level of user. The current work can be concluded as follows:

1. Emotional empathy of girls is more as compared to boys.
2. Students can be trained for emotional empathy as well as cognitive empathy if they deficient in both or exclusively for emotional or cognitive as per the individual's deficiency.

REFERENCES:

- [1] E. J. Lawrence, P. Shaw, D. Baker, S. Baron-Cohen and A. S. David, Measuring empathy: reliability and validity of the Empathy Quotient, *Psychological Medicine*, 2004, 34, 911-924. 2004 Cambridge University Press.
- [2] R. C. Fraley, University of Illinois at Urbana-Champaign Information on the Experiences in Close Relationships-Revised (ECR-R) Adult Attachment Questionnaire. <http://internal.psychology.illinois.edu/rcfraley/measures/ecrr.html>.
- [3] A. Mehrabian, Manual for the balanced emotional empathy scale (BEES). Available from Albert Mehrabian, 1996, 1130.
- [4] F. F. Youssef, P. Nunes, S. Bidyadhar, S. Williams, An exploration of changes in cognitive and emotional empathy among medical students in the Caribbean, *International Journal of Medical Education*. 2014; 5: 185-192 ISSN: 2042-6372.
- [5] P. Maurage, D. Grynberg, X. Noel, F. Joassin, P. Philippot, C. Hanak, P. Verbanck, O. Luminet, P. Timary, and S. Campanella, Dissociation Between Affective and Cognitive Empathy in Alcoholism: A Specific Deficit for the Emotional Dimension, *Alcoholism: Clinical and Experimental Research*, Vol. 35, No. 9 September 2011
- [6] A. Smith, Cognitive empathy and Emotional Empathy in Human Behavior and Evolution, *The Psychological Record*, 2006, 56,3-21.
- [7] A. A. Gasparini, Perspective and Use of Empathy in Design Thinking, ACHI 2015: The Eighth International Conference on Advances in Computer-Human Interactions.
- [8] A. A. Gasparini, The Value of Empathy in Design Thinking, NordiCHI 14 workshop Innovation in HCI: What can we learn from Design Thinking? October 27, 2014, Helsinki, Finland.
- [9] D. McDonagh and J. Thoma, Rethinking Design Thinking: Empathy Supporting Innovation, *Australasian Medical Journal AMJ* 2010, 3, 8, 458-464.
- [10] N. Eisenberg, R. A. Fabes, S. A. Shepard, B. C. Murphy, S. Jones, Contemporaneous and longitudinal prediction of children's sympathy from dispositional regulation and emotionality. *Developmental Psychology*, 1998, 34, 910-924.
- [11] B. K. Bryant, An Index of Empathy for Children and Adolescents. *Child Development*, 1982, 53 (1), 413-425.
- [12] <https://www.theguardian.com/life/table/0,,937442,00.html>
- [13] Ekman, P (2003). *Emotions Revealed*. New York: Times Books

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