

A Study on Relationship between Emotional Quotient and Recollection & Retention in E-learning

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Abstract— E-Learning plays a vital role in the field of education. Emotional Quotient (EQ) is one of the human factors. Similarly Recollection and Retention (R & R) is one of the cognitive factors of E-Learning process. The various parameters that constitute EQ are helpful in imparting higher education. The objective of this paper is to find the relationship between EQ and R & R factors in E-Learning Environment. An experiment is conducted using Trait Emotional Intelligence tool. A questionnaire has been designed to check the R & R skills of the e-learners. The experimental results show that there is a positive relation between EQ and R & R factors in the learning process.

Keywords- Cognitive Science, E-Learning, Recollection and Retention, Emotional Quotient, User Interface Design

I. INTRODUCTION

E-Learning is commonly referred to the international use of networked information and communications technology in teaching and learning [1]. E-Learning is the use of technology to enable people to learn anytime and anywhere. E-Learning may include training, the delivery of just-in-time information and guidance from the experts.

User interfaces should be designed by matching the skills, experience and expectations of its anticipated users [2]. User interface design or user interface engineering is the design of computers, appliances, machines, mobile communication devices, software applications, and websites with the focus on the user's experience and interaction [3].

Cognitive science is the study of the mind. It is an interdisciplinary science that draws upon many fields including neuroscience, psychology, philosophy, computer science, artificial intelligence and linguistics. The purpose of cognitive science is to develop models that help to explain human cognition - perception, thinking, and learning [4].

Emotional Intelligence (EI) is another human factor, describes the ability, capability and skill. However, in the case of trait EI model, a self perceived grand ability is used to identify, assess, manage and control the emotions of one self, of others and of groups. Emotional Quotient (EQ) has grown as relationships and communications that have come to be seen as core components of organizations, along with intelligence and technical skills [5][14]. Recollection is the retrieval, or recall of memory [6][7][8].

The Trait Emotional Intelligence Questionnaire (TEIQue) is an integral part of the scientific research program. The TEIQue is designed based on a psychological theory [9][15]. This is a 30-item questionnaire designed to measure global trait emotional intelligence (trait EI). TEIQue has five factors, viz., well-being, self-control, emotionality, sociability and global trait EI [10][13].

Finding the relationship between EQ and R & R factors in E-Learning environment is the main objective of this paper. In order to find the relationship between EQ and R&R, experiments are conducted. Based on the results, recommendations are provided for the E-Learning user interface designers. The rest of the paper is organized as follows: Section 2 gives the background work and Section 3 presents the methodology of this

research work. Section 4 discusses the results, and provides recommendations based on the findings. Section 5 concludes the paper.

II. BACKGROUND

Robin Berenson et al. [9] have conducted a research on Emotional Intelligence as a Predictor for Success in Online Learning. Their findings reveal that there is a relation between online students' academic performance and emotional quotient.

Dianne R. Hill et al. explored the relationship between distance education students, academic performance and emotional quotient. Finally, they have found that there is a positive relation between distance education students' academic performance and emotional quotient [10].

Christine Wibhowo et al. have explained about e-learning as one of the most powerful learning. E-learning students are very active and intelligent compared to traditional students. They have found that there are problems associated with the E-Learning students with respect to emotion, motivation, self-discipline, stress, and social skills. If these problems are solved, the e-learning students can perform better in all aspects [11].

Nada Salem Abisamra has conducted a online emotional test with 500 eleventh grade students for 30 minutes using Baron Emotional Quotient Inventory Test. He has compared students' EQ and their final semester marks. Finally, he has found a relationship between emotional intelligence and academic achievement and suggested to revise the school curricula to improve the students' emotional intelligence [12].

III. METHODOLOGY

The Experiment is designed with various processes like designing the questionnaire, sample selection, and pretest the questionnaire. In this experiment, two types of tests have been conducted with the students. The first test is emotional quotient (EQ) which classifies the students based on their emotional quotient. The TEIQue tool is used for EQ test. The second test is recollection and retention (R & R), which is conducted to identify the observation of the e-pages by the students based on colors, images and text. Based on the outcome of these two tests, the relationship between R & R and EQ is found out.

For the R & R test, a set of questions is submitted to the academic experts. They have suggested different criteria to customize the questionnaires. Based on the criteria, 20 questions regarding color, text and image on the E-learning pages have been selected for this study.

200 students pursuing MCA course who have scored first class (i.e. 60% and above) upto semester IV are selected for this experiment. The EQ test is conducted for thirty minutes and the results are obtained. The EQ test is followed by the R&R test. But the R & R test is divided into two sessions; In the first session, a list of E-learning pages are shown to the students for ten minutes. The information in these E-Pages contains text, images, programming code with background color; In the second session, the same R & R test is conducted after twenty four hours with the same set of students and the results are obtained. The obtained results are analyzed statistically. Figure 1 shows the experimental design of the study.

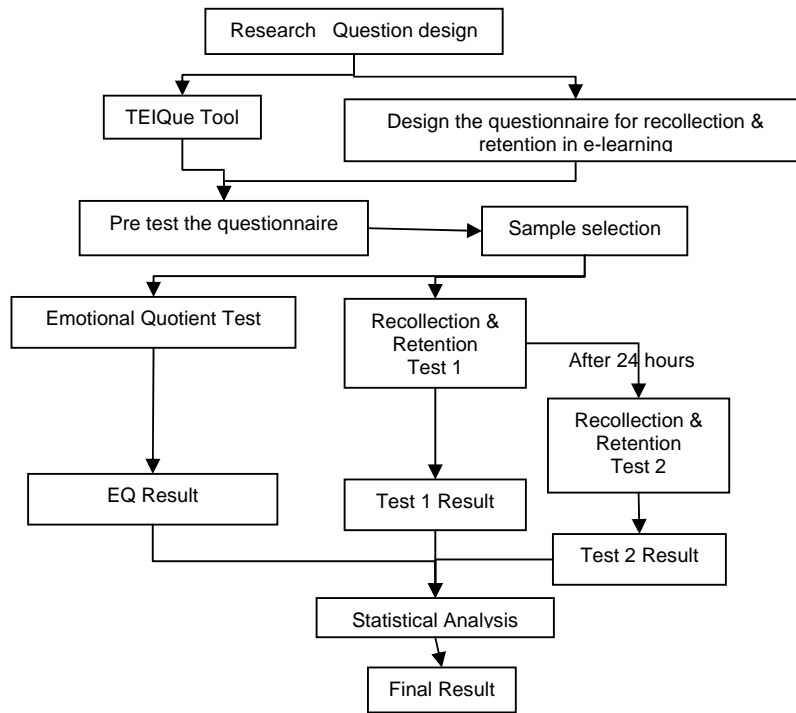


Figure 1. Experimental Design (Methodology)

IV. RESULTS AND DISCUSSION

A. Classification of emotional quotient among students group

Based on the TEIQue, the students are classified into five major factors, namely, well-being, self-control, emotionality, sociability and global trait EI. Table 1 shows the percentage of students against the emotional factors. Figure 2 shows the graphical representation of the classification. The percentage of Self-Control students is only 10 which is the lowest percentage. But the percentage of Global Trait EI is 28.5. It is the highest among the factors.

TABLE 1. STUDENTS GROUP

Emotional Factor	Students (%)
Well Being	27.5
Self Control	10
Emotionality	17.5
Sociability	16.5
Global trait EI	28.5

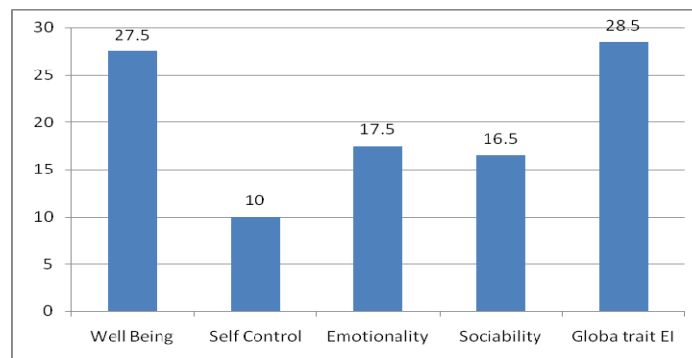


Figure 2. Students Group

B. Relationship between personality traits and R & R skill

The results of EQ and R&R tests are considered independently. The EQ results are obtained with the help of TEIQue and R&R results are obtained from the R&R test. The relationship between EQ and R&R skill is observed by using a statistical tool (SPSS). From the results, it is observed that sociability shows only a negative correlation in R & R Test-1. Furthermore, the correlation is positive in all emotional factors. Table 2 and Figure 3 show the relationship between EQ and R&R Test-1.

TABLE 2. RELATIONSHIP BETWEEN EQ AND R&R TEST 1

Emotional Factor	R&R Test 1
Well Being	0.016924
Self Control	0.541275
Emotionality	0.11731
Sociability	-0.33811
Global trait EI	0.2957

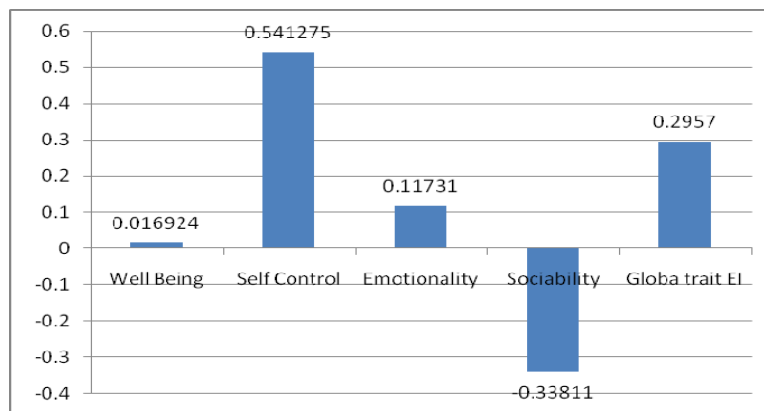


Figure 3. Relationship between EQ and R&R Test 1

After 24 hours, the second test (R&R Test-2) has been conducted to the same set of students in order to observe their R&R skills. The correlation indicates that the well-being factor and emotionality factor students' EQ and R&R skills show positive relation. The results are tabulated in Table 3.

TABLE 3. RELATIONSHIP BETWEEN EQ AND R&R TEST 2

Emotional Factor	R&R Test 2
Well Being	0.01592
Self Control	-0.09095
Emotionality	0.164237
Sociability	-0.32438
Global trait EI	-0.0193

C. Well-Being

In this category, 49% of well-being students like blue color and 47% of them like Times New Roman font style. Table 4 shows the results obtained from the experiments and the Figure 4 shows the graphical representation of the results.

TABLE 4. RELATIONSHIP BETWEEN COLOR AND TEXT FOR WELL-BEING STUDENTS

COLORS	NO OF STUDENTS	TEXT	NO OF STUDENTS
Blue	27	Times New Roman	26
Green	10	Courier New	10
Black	8	Monotype Corsiva	8
White	10	Arial	11

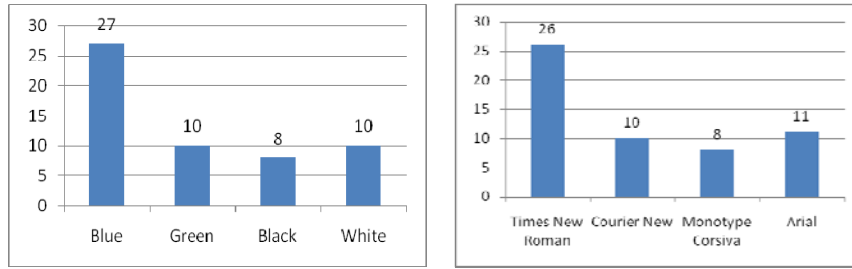


Figure 4. Relationship between color and text for well-being students

D. Self- Control

From the experimental results, it is observed that 40% of the self-control students' like green color and no one likes black color. Also, 50% of the students' like Courier New font style and no one likes Monotype Corsiva font style. Table 5 shows the relationship between color and text for self-control students and the Figure 5 shows the relation in a graphical representation.

TABLE 5. RELATIONSHIP BETWEEN COLOR AND TEXT FOR SELF-CONTROL STUDENTS

COLORS	NO OF STUDENTS
Blue	5
Green	8
Black	0
White	7

TEXT	NO OF STUDENTS
Times New Roman	2
Courier New	10
Monotype Corsiva	0
Arial	8

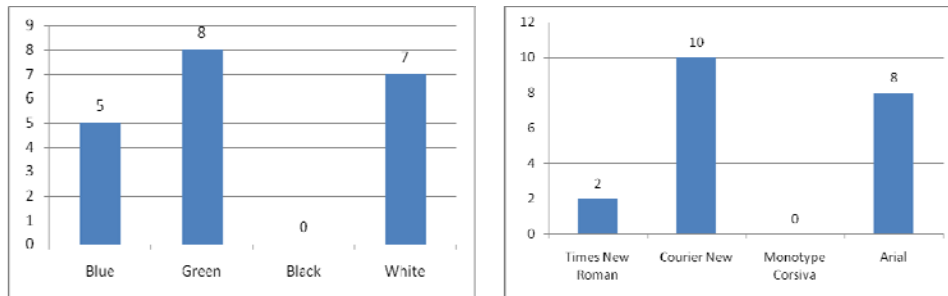


Figure 5. Relationship between color and text for self-control students

E. Emotionality

It is found that the 42% of the students who like white color and no one likes black color. When considering the font style, 45% of students like Times New Roman font style and no one likes Monotype Corsiva font. Table 6 projects the relationship between color and text for emotionality students and the Figure 6 shows its graphical representation.

TABLE 6. RELATIONSHIP BETWEEN COLOR AND TEXT FOR EMOTIONALITY STUDENTS

COLORS	NO OF STUDENTS
Blue	11
Green	9
Black	0
White	15

TEXT	NO OF STUDENTS
Times New Roman	16
Courier New	14
Monotype Corsiva	0
Arial	5

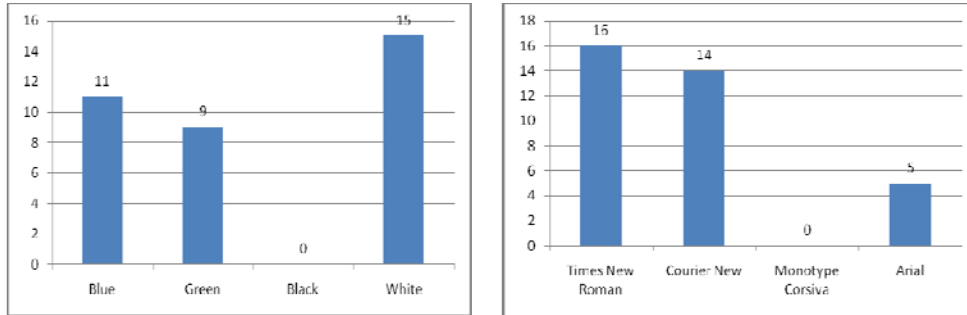


Figure 6. Relationship between color and text for emotionality students

F. Sociability

It is found that 48% of students like blue color and 36% of students like Arial font style. Table 7 shows the relationship between color and text for sociability students and the Figure 7 projects the results graphically.

TABLE 7. RELATIONSHIP BETWEEN COLOR AND TEXT FOR SOCIABILITY STUDENTS

COLORS	NO OF STUDENTS
Blue	16
Green	9
Black	4
White	4

TEXT	NO OF STUDENTS
Times New Roman	8
Courier New	9
Monotype Corsiva	4
Arial	12

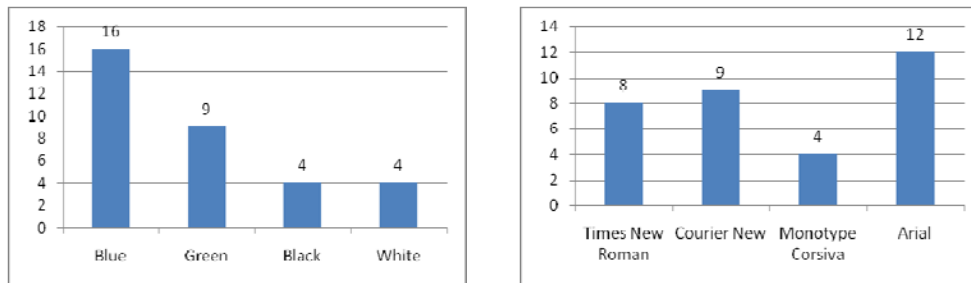


Figure 7. Relationship between color and text for sociability students

G. Global Trait EI

In the Global Trait EI factor, 38% of students are found liking white color and 45% of students like Times New Roman font style. Table 8 shows the relationship between color and text for global trait EI students and the Figure 8 shows the graphical representation of the results.

TABLE 8. RELATIONSHIP BETWEEN COLOR AND TEXT FOR GLOBAL TRAIT EI STUDENTS

COLORS	NO OF STUDENTS
Blue	19
Green	12
Black	4
White	22

TEXT	NO OF STUDENTS
Times New Roman	26
Courier New	13
Monotype Corsiva	3
Arial	15

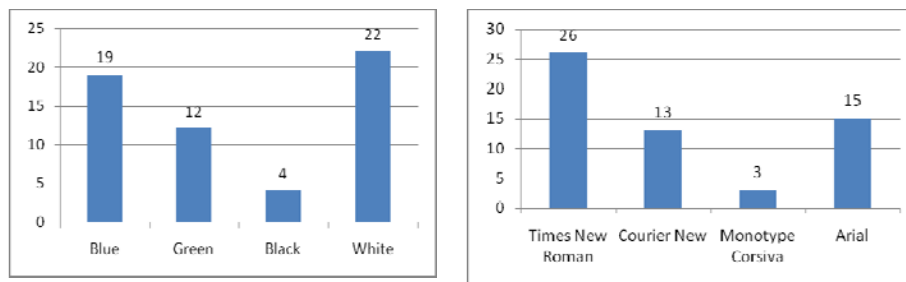


Figure 8. Relationship between color and text for global trait EI students

V. CONCLUSION

In this paper, few experiments have been conducted to find the impact of emotional quotient in recollection and retention ability in E-Learning. The students have been classified based on their emotion. They are categorized into five types of personality. Most of the students come under the global trait EI and well-being category.

The relationships between EQ and R & R skills in E-Learning are explored clearly from the results. The findings of R & R test 1 reveal that the students with self control have excellent R & R skills. The same R & R test is conducted after 24 hours. It shows that students with sociability have excellent R & R skills.

From the results, it is found that the well being students can recollect in a better way when the texts are in Times New Roman font with blue related background. However, the self controlled students can recollect in a better way when the texts are in Courier New font with green related background. Emotionality and global trait students can recollect in a better way when the texts are in Times New Roman font with white related background. The sociability students are able to recollect in a better way when the texts are in Arial font with blue related background.

To sum up, most of the students recollect in blue color and Times New Roman font style arrangements. While designing the user interface for E-Learners, the designers may consider these recommendations to produce better results and beneficial to the E-learning community.

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