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CONCLUSION

“We want principles, not only developed – the work of the closet – but applied, which is the work of life.”

- Horace Mann

7.1 Overview

E-learning has evolved from first Computer Based Training (CBT) approaches. These approaches were often a good replacement for written books but hardly a replacement for teachers, up to Web Based Trainings with a wider range of material, potential of personalization and support for communication and collaboration. The pedagogy of E-learning systems have changed from a pure behavioristic drill and practice models to a combination of different models, including cognitivism and constructivism, and a mixture of different technologies. Design issues in the E-learning have been a persistent challenge and need to be addressed. The lack of any framework based on human and cognitive factors in UI design calls for a consideration of such. A framework constituted of human factors such as Personality, Emotional Quotient and Intelligent Quotient, and cognitive factors such as recollection and retention is suggested for the UI designers. Supported by trait identification tools and recollection and retention tests, the learner’s preferences are observed through Association Rule Mining techniques. Coefficient of correlation of the analysis is made between the existing UID and the new UID, which is designed with
learners preferences observed from rules. The findings show the improvement of cognitive skills in the learners.

The process of getting to know the learner is never-ending, because there is so much to know, the human and cognitive factors. However, every step towards understanding the learners and recognizing them as individuals with outlooks different from the designer’s own, is likely to be a step closer to a successful User Interface Design.

The proposed work drives the UI designers to be more appealing to the learners based on Personality, EQ and IQ. The ArCUID framework is constituted with human factors and cognitive factors for effective UID.

### 7.2 Salient Features of the Present Research Study

This section briefs about the features and the findings of the present research study viz., the affiliation among the human factors and the cognitive factors of the learners, and the proposed ArCUID framework.

**7.2.1 UID Based on Personality (UIDBP)**

E-learning, with the advancement of technology and the information age, has an influence in the pedagogy and in the ways of learning. Personalised learning and teaching could be regarded as an ultimate level of instruction. UIDBP uncovers the relation between Personality and the UID parameters in the E-learning environment. UIDBP, based on the cognitive factors affected by the Personality, spots that the effectiveness of any user interface depends on the
efficient use of the UID parameters. The preferences of the learners are assessed by the UIDBP and the following preferences are inferred. The procedure enlists, Extraversion type of learners to prefer blue colour background and Times New Roman font type, Neuroticism type prefer green colour background and Times New Roman font type and the Psychoticism type learners prefer white colour background and Times New Roman font type. The enhanced UID, based on Personality trait of the learners, is designed with the identified parameters from the UIDBP. The improvement in the performance of the learners shown in the research, ascertains the relation between personality and the cognitive factors.

7.2.2 UID Based on Emotional Quotient (UIDEQ)

Many researchers have shown that E-learning is one of the means which outshines the traditional learning. The E-learning process is also influenced by the Emotional Quotient and cognitive factors. Hence, UIDEQ process, formed with Trait Emotional Intelligence Questionnaire (TEIQue), ARM technique and correlations, combines Emotional Quotient with the UID parameters to improve the recollection and retention skills of the learners. UIDEQ identifies the preferences of the various types of EQ and pinpoints them. From the research findings, blue colour background is preferred by Well-being and Sociability type, white colour background is preferred by Emotionality and Global Trait EI, and green colour background is preferred by Self-control type of learners. The type of font preferred by the Well-being, Emotionality and
Global Trait EI is Times New Roman, whereas Self-control and Sociability prefer Courier and Arial respectively. Hence a design based on the findings of this research work proves the improvement of performance of the learners.

### 7.2.3 UID Based on Intelligent Quotient (UIDIQ)

Intelligence is well associated with performance on a wide range of cognitive tasks and is a reliable predictor for educational and professional success. Therefore, the development of effective training patterns, that aim to improve learning, is achieved through UIDIQ. This procedure explores the relation of IQ with the cognitive skills. The pertinent user interface parameters such as background colour and font type are speculated by the UIDIQ. The following are the applicable preferences discovered with UIDIQ: blue colour background with Times New Roman font style for the level I, green colour background with Times New Roman font type for level II and white colour background with Arial font type for the level III. These exhortations deduced from the analysis of UIDIQ are used for designing a UID and the same is exercised in testing the performance of the learners. The results prove that the proposed procedure improves the performance of the learners.

### 7.2.4 ArCUID Framework

ArCUID, a combination of the aforementioned human factors in the design of user interface, is the proposed UID framework. The framework relates Personality, Emotional Quotient and Intelligent Quotient to formulate
patterns that influence the cognitive skills of the learners. With the coupling of the human factors affecting the learner’s pursuit of knowledge, ArCUID framework plays a vital role by recommending efficient parameters in the design. ARM technique is employed in picking the preferred parameters. The knowledge engine in the ArCUID framework retrieves the trained patterns in relation to the learner’s human factor. These trained patterns are given to the designer to design better UIDs. With the exercise of new UID in the process of learning, the improvement of recollection and retention skills is attained.

7.3 Applications of the Research

The technological advancements have widely influenced education and its pedagogy, hence the use of appropriate user interface design parameters is inevitable. The use of the proposed research improves UID based on the human factors and thus enhances learning.

As the uses of UID in industries are increasing, the human factors are incorporated well with the use of the research work.

The burgeoning online tutorials (w3schools, moodle, etc.) face challenges such as sustenance of learners, effective usage and the like. The recommendation provided in the thesis could be assimilated such that the challenges are faced resolutely.

The comprehension of the learners could be augmented persistently with the use of the suggestions of the research. When the learners pursue their
education that soothes their human factors the knowledge increases and the interest escalates.

7.4 Limitations

In the present research, the samples selected are learners of post graduate science course of Bharathidasan University. The sample selection has been restricted to the age between 20 and 25. The kids, teens, real grownups, young men, and old are not thought-out. Gender differences are also not considered as it could propone varied effects.

Although, the cognitive skills enlist a variety of skills, only recollection and retention are aforethought.

The User Interface design parameters considered are only font type and background colour.

7.5 Scope for Future

There are other psychological scales, including tolerance for stress; tolerance for ambiguity, motivation, or compulsiveness.; field dependence versus independence; assertive versus passive personality; and left-brain versus right-brain orientation, which could be explored for significant UIDs.

Various UID parameters such as audio, video and animations could be imbibed in the research in order to bring out more efficient designs.
The cognitive skills such as comprehension and attention could be considered for designing better UIDs. Other technologies could be incorporated such that more personalized UID may be designed.

Global design patterns may be deduced for the efficient UID inclusive of demography, cultural milieu and other factors.
References