Associative Relevance based Learning Practice betters eLearning

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Abstract

Transfer of learning through better learning practices has been a fundamental topic among eLearning researches. The learning practice based on cognitively inherent underlying mechanism of associative relevance can develop expert knowledge-providers and improved knowledge-seekers as well. In this investigation, we experimented to collect data from the participants who took part in this research. The collected data were examined for our hypothesis that the eLearning materials based on associative relevance could substantially enhance transfer of learning process. The analyzed data confirmed our hypothesis that associative relevance based learning practice bettered eLearning.

Keywords: *Associative Relevance, Cognition, Learning, eLearning*

1. Introduction and background

Learning practice in eLearning is one of the core research issues that engage in rigorous undertakings for Practitioners, Teachers, Scholars, Researchers, Instructors, and Educationalists. Although there have been traditional learning practices in use since long, yet recent studies reveal that the traditional learning practices are inadequate and incompetent transfer of learning practices. Accordingly, the ultimate goal is to intersect from traditional learning practices to higher-level or optimized learning practices, and to design more comprehensive resolutions that cover training, knowledge sharing, collaboration, and performance improvement, all in the context of work. People are constantly experimenting, and their concern for making a difference keep them going [1-5].

One of the notable solutions for the problem of learning practices, which receives widely accepted approval, is based on human cognition. During the transfer of learning process, the cognitive processes get evolved, perceived, attained, and adapted the transferred contents or materials. Hence, the studies of cognitively generated underlying mechanism during the transfer of learning and applied practices for the transfer of learning are of prime concern for further advancement. Definitely, by embedding the influential underlying factors in eLearning materials, we can enhance the transfer of learning processes as well [6-16].

Cognitively, human mind and integrated memory join in the transfer of learning process. During the transfer of learning, human mind and memory coordinate and align with underlying cognitive processes. In between these cognitive processes of sensation, consciousness, attention, perception, metacognition, analogical thoughts, visualization, and adaptation, there exists an essential and mandatory process, i.e. the process of viewing the objects and assigning relative identities. These assigned identities are afterwards related on the basis of underlying recognized associations among them. The higher-level of perceptions that emanate such thoughts of similarity, bring the notion of associative relevance in current context [16-23].

During the learning process of eLearning materials, a human regards the materials and underlying cognitive processes make efforts for efficient retrieval of knowledge or information that are displayed. Further, human mind works for memory management and permanent storage as long-term memory in the human brain. The process of storage gets involved in after the cognitive establishment of relevant association within the contexts as it makes comparatively better accumulation and retrieval of memory. A number of proposed human learning models include the memory as a fundamental component. The models based on associative memories significantly influence our understanding of about learning involving mind and memory. For transfer to occur, the original learning must be repeatedly reinforced with multiple examples or similar concepts in multiple contexts, on different levels and orders of magnitude. Learning from examples which are the consequence of similarity transfer, can be viewed as a method to reduce the intrinsic entropy or disorder in the system by excluding unrelated connection that are in compatible with a learning set. In other words, we do want to retain only the associative relevance

in terms of connected similarities within the contexts or different levels and orders of magnitude and transfer from one scenario to another scenario [16-31].

Moreover, the concept of similarity has been fundamental to transfer and to reasoning in general. There seems to be a positive correlation between surface similarity and deep important underlying structural similarity. Mostly, surface similarity is a good indicator of deeper kinds of transfer. The very structure of our brain may have evolved to operate on the basis of feature of similarities in our environment, to generalize, in other words, to transfer. Therefore, we deduce that the associative relevance in correlated contexts for standing similarities in our environment is essential for deep transfer of learning as well [17-24].

Associative relevance is basically related similarity in which the same relations or likeness hold between different domains or systems. The main focus of our research is on the associated thoughts and processes placed in eLearning materials. In the eLearning materials, the correlated and coexisted objects have considerable relevance by which people understand one state or pattern in terms of another. Associative relevance is evolutionary and cohesive notion which is emanated from thoughts of analogy. Associative relevance can be sensed along and after the happening of the analogy phenomena. Like analogy, associative relevance is significant in cognitive processes and is key mechanism in concluding creativity which is also a part of the subject, like eLearning [26-31].

We employ learning practices based on associative relevance for eLearning materials. In this approach, we aim to transfer the associative contexts or intents of eLearning material to the learners. The contexts or intents are connected via associative chaining as per existing relation among the contexts or concepts or even, scenarios. By doing so, we intend to initiate human's cognitive processes, including consciousness, perception, analogical thoughts, reasoning, metacognition, and the most importantly, the notion of associative relevance. So, the learner’s mind could in turn, associate and organize the memory as per the contexts of eLearning materials unambiguously and naturally.

In this study, we investigate our hypothesis that the associative relevance based learning practice betters eLearning. This research study on eLearning and relevant materials is carried out from cognitive perspective, including the underlying mechanism of associative relevance, during viewing of eLearning materials. For the purpose, we follow along the steps of planning experimental setup, statistical data analysis, and data visualization for interpretation, which are the key steps during the entire study. This research study is significant from the application prospects because this associative relevance based learning practice can improve eLearning. Associative relevance is a novel perspective to tackle the problem as well. That’s why this research is unique and forward directional research in the area of eLearning. Moreover, by adapting transfer of learning practices in accordance with associative relevance notion that exist during the learning process, we can improve the learning process. At the same time, the learner's mind can perceive and withstand gigantic amount of knowledge and retain it in memory as long-term. E-Learning based on associative relevance is proposed learning practices that can assist and enhance learning process.

2. Method

Initially, participants view general eLearning materials which are shown as traditional learning process. The data related to this eLearning material based on traditional learning practices are collected from participants as feedbacks. Thereafter, the participants are requested to view eLearning materials based on associative relevance that are redesigned cognitively based on associative relevance notion. The data related to this eLearning material based on associative relevance are collected as feedback as well. Finally, we analyze all collected data for interpretation statistically. The interpretation is carried out with the help of statistically existing parameters for such study.

The main objective of this study is to prove the learning practice based on associative relevance is improved, imperative, and well-intentioned for learning process than traditional learning practice.

The study of learning practices for eLearning materials consists of a number of steps to be performed. These steps are represented as shown in the adjacent flow chart diagram (figure 1). This is a comparative study of two data (the data from traditional learning practice and the data from associative relevance based learning practice) analytically.

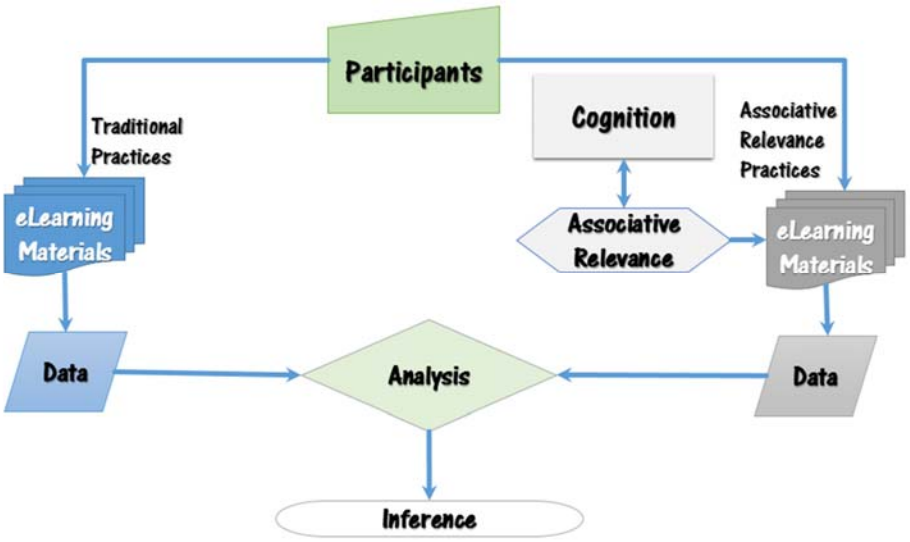

Figure 1. Flow chart of research study

We selected 140 participants from a number of classes randomly, aging from 21 years to 30 years. These Subjects, the participants were assigned to regard two sets of ordinary slides as shown below in figure 2.

Basically, the first set of slides (in upper-half of the figure 2) consists of six slides related to the topic of 'Types of Display Device' and the second set of slides (in lower-half of the figure 2) consists of six slides related to the topic of 'Types of Barcode'. These common slides, related to computer science course, are displayed during active viewing of the participants.

Figure 2. Selected Learning Slides for research study

3. Analysis

There are two phases of analysis for our study. At first, we demonstrated and studied the two sets of slides as 'Analysis 1' and 'Analysis 2' for our experimentations. Thereafter, detailed data analysis would be carried out for interpretations and conclusion.

3.1. Analysis 1: Study of first set of slides for 'Types of Display Device'

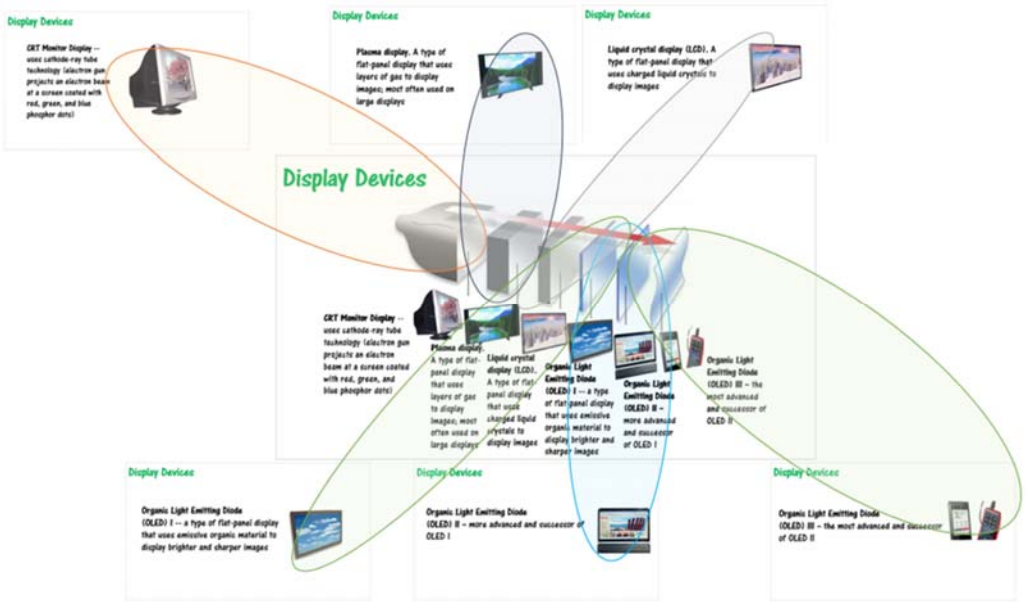

Figure 3. A set of slides and their associative relevance in amended slide

In this experimental analysis for the set of slides related to 'Types of Display Device' (figure 3), at first, we presented to the participants the first set of six slides sequentially. We instructed the participants with traditional learning practice. In this traditional learning practice, keeping single subtopic for single slide had been considered as the easiest and the most efficient way of learning. The participants regarded the individual six slides and concluded their feedback.

Afterward, the participants were shown the amended slide (the central slide in figure 3) based on associative relevance consideration, i.e., keeping the associated subtopics in relevant unified manner in single slide along with relative representation, so that viewers may observe the inherent cognitive processes along with analogical thoughts as well as associated contexts or intents relevantly. This amended slide considered all the aspects of existing association among the contexts and attempted to enhance transfer of learning cognitively, with the purpose of informative adaptation by learner's mind naturally.

However, the participants observed the single slide of eLearning material. Later, we collected the data as feedback of participants' responses in the survey.

3.2. Analysis 2: Study of second set of slides for ‘Types of Barcode’

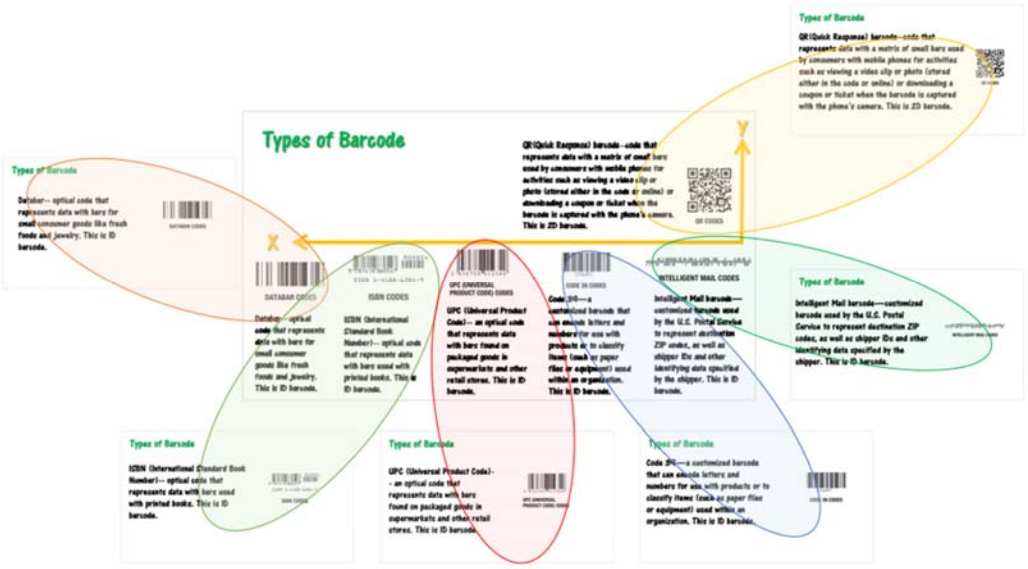

Figure 4. A set of slides and their associative relevance in amended slide

In this analysis of slides for ‘Types of Barcode’ (in figure 4), at first, we conducted experimentation and recorded the observation as data from participants who observed the individual six slides sequentially. These instructed slides were based on the general learning practice which stated that for the easiest and optimized mode of learning, there should be separate slide for separate topic.

Afterward, we demonstrated and instructed with the amended slide (the central slide in the figure 4) which was based on associative relevance consideration. As we noticed from the amended slide that there were associative contexts or intents within different portions of the slides, which were relevantly linked as associative consideration for the learner’s adaptive brain cognitively. This notion that remained within underlying mechanism of cognitively generated thoughts was seemed as influential factor for learner’s adaptive mind.

However, the participants viewed the slide and gave us feedbacks that were gathered as data for further analysis.

4. Statistical data analysis

Based on gathered data from the participants as feedback, we analyze the data statistically. The distribution of all experimental data is plotted as chart in figure 5.

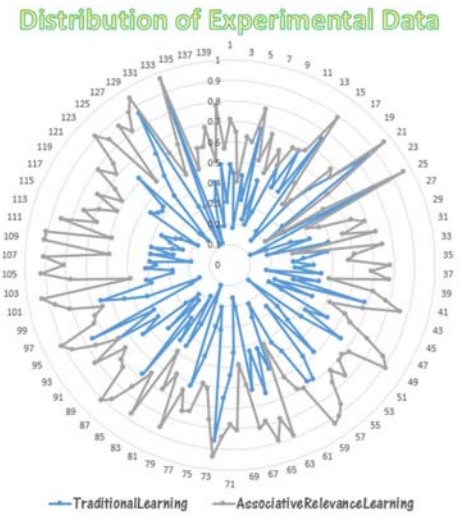

Figure 5. Chart for data distribution of participants along with learning practices and capabilities

Moreover, to test our hypothesis, we begin to analyze the obtained data using t-test for two variances of dependent samples. Our experimental data, i.e. the obtained samples conform to the presuppositions that the assumptions accompanying with using the t statistic to test a null hypothesis are: at first, the samples are dependent, secondly, the populations are normally distributed, and, thirdly, the dependent participants are a random sample from the population of interest or the dependent participants have been randomly assigned to the conditions in the experiment [32-35].

Initially, we suppose that there is no mean difference hypothetically between the two data series (samples) obtained from associative relevance based learning practices and traditional learning practices. This is our null hypothesis. In other words, this statement is our acceptance that there is no difference in dispersions of the two samples. The variances of the two samples are equal and there is no difference in the variances of the two samples obtained from two different learning practices. Hence, as per our null hypothesis, we suppose that the associative relevance based transfer of learning practice makes no difference with traditional learning practice and both are equal as per their influences.

However, we undertake our alternative hypothesis which is opposite to our null hypothesis, i.e. there is significant difference in the variances of the two samples obtained from the two learning practices. Henceforth, as per our alternative hypothesis, we can accept there is substantial differentiation between the associative relevance based learning practice and traditional learning practice.

These computations leads towards the following results as mentioned in Table 1. Hence, the obtained results are ready for interpretations and subsequent inferences for both learning practices.

Table 1. The t-test for two-sample (associative relevance and traditional learning practices)

t-Test: Two-Sample Assuming Equal Variances		
	Associative Relevance Learning	*Traditional Learning*
Mean	0.702928571	0.399285714
Variance	0.022432369	0.03266999
Observations	140	140
Pooled Variance	0.027551179	
Hypothesized Mean Difference	0	
df	278	
t Stat	15.30530514	
P(T<=t) one-tail	4.47229E-39	
t Critical one-tail	1.650353233	
P(T<=t) two-tail	8.94458E-39	
t Critical two-tail	1.968533975	

As we see from the above mentioned statistical outcomes, the t-test statistic shows that the obtained t-stat lies far beyond (nearly 7.5 times) the critical t for two-tail (non-directional) and t-stat lies far beyond (nearly 10 times) the critical t for one-tail (directional) analysis.

As a result, we reject the null hypothesis and accept our alternative hypothesis that the associative relevance based transfer of learning practice is better than traditional learning practice.

5. Conclusion

We conclude that the transfer of learning based on associative relevance is more advantageous and well-organized in comparison to traditional learning in eLearning.

Further, statistical facts firm that eLearning based on associative relevance practices can improve the transfer of learning manifold as well.

6. Acknowledgement

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