Improving Online Education Systems Based on the Emotions and Personal Type

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ABSTRACT

With fast development of technology, e-learning has become one of the most popular education models and everyone can employ it without time and spatial constraints; but this type of education is not sufficiently dynamic because the system only plays the role of a simple media for transferring knowledge. While psychological studies show that personal characteristics like emotion and personal type play an important role in all aspects of life including learning. Thus, in order to increase efficiency of this type of education, these two important factors should be considered in electronic education. In this study, we try to identify user emotion from touching behavior of the user on touch devices like tablets or smartphones. In addition to ability to detect emotion, online education system should be able to improve negative emotions of users. This is not as easy as showing a few images or playing a music but it is a professional task which is different for different users which have their own characteristics. One of the important personal characteristics of human is personal type. In this study touching behavior patterns of the user is used to specify the user's emotion then the negative emotions is improved considering of their personal type. Statistical results show that we detect boredom, frustration and anxiety with 90%, 79% and 65% Precision and also improve the user efficiency significantly with our proposed method. Statistical sample includes 51 men and women from Razi University of Kermanshah between 2016-2017.

KEYWORDS

Electronic education, Emotion detection, Touch behavior, Personal type.

1 INTRODUCTION

The fact that using computer and information technology might develop learning procedure is accepted today [1]. Thus, electronic education has become a popular and common concept in education environment which is getting even more popular. E-learning is a new technology which provides a strategy for developing education and learning quality at each time and place. It is expected that this trend moves faster forwards and turns into the main education procedure [2]. Since electronic education provides unique flexibility by breaking time and spatial constraints [3], it can be said that it is a promising platform which has potential of a revolution in education industry. One of the main disadvantages of e-learning is that more than 65% of information is exchanged among people through non-verbal communications. Therefore, in this type of education, less information is received compared to conventional education since there is no face-to-face communication [2]. While many of the researchers are attracted to cognitive procedure of the learner, they ignore emotion and personal type of people in current e-learning systems.

Therefore, current electronic education system lack sufficient dynamicity and do not establish necessary interaction system to attract student. In fact, this system only plays the role of a simple media for exchanging knowledge; this system lacks positive aspects of real education environments which result in its success.

Our proposed approach has two steps: 1) emotion detection using touch behavior 2) improve the negative emotion considering personal type

First, users touching behavior pattern is used to identify their emotion. We propose a feature set that which has high precision. In this study, three important emotions are considered: anxiety, frustration and boredom. We used these three emotion because they are important in

educational environment based on some researches.

An online education system should be able to improve the negative emotions of users in addition to detect emotion to increase user efficiency. This is not as easy as showing a few images or playing a music but it is a professional task which is different for different users with unique personal characteristics, then we need to consider these personal characteristic to improve our educational environment. One of the most important personal characteristic is personal type. Personal type of the user is determined using Riso-Hudson Enneagram Type Indicator (RHTEI) questionnaire (1.3 section). Each user initially answers these questions and is classified into one of the 9 categories. After that, this information is used to improve the negative emotions of users.

The rest of this article is organized as follows: in section 1.2 and 1.3 we bring some concepts in emotion and personal type; then we review related work in Section 1.3; and then present our approach in Section 2; experimental setup, evaluation results are reported in Section 3; Section 4 concludes the paper; section 5 and 6 outlines recommendation and future research directions.

1.1 Emotion

Psychological studies demonstrate that psychology states play an important role in human life. Psychological states are an important and necessary factor for making logical decision, intelligence and optimal use of memory [4].

Human emotions play a key role in mental activities. Studies show that emotion affect mental activities like perception, creativity, decision making, memory and motivation [5]. Our emotions are able to affect our thoughts also [6].

In general, emotions play an important role in verbal and non-verbal communications. In cognitive activities like education, relationship between learner and trainer is one of the main issues and its quality affects education procedure [7]. Scientists believe that students who experience negative emotions are less able to learn new information while students who experience positive emotions have higher perception, motivation, receive more information

and understand issues better. In conventional classes teachers try to adapt education process with emotions of the students. But, this point is not considered in online education [4].

Education procedure is an emotional process. Negative emotions damage the learning process so it should be avoided as much as possible. Emotions are important from two points of view. First, emotions affect learning and ability to process and understand information. So, it is important for the teachers to have a class in which students have positive emotions so that their efficiency is increased. Second, managing emotions result in success of students [6].

Usually, emotions are out of our control and they are said to be unconscious; therefore, it is important to find relationship between emotion and performance and it is important that the students learn to control, manage and counteract their emotions [6].

Human being conscious of his emotion is a big step towards controlling his emotion. In order to increase positive emotions, they can be controlled and guided towards positive emotions; in fact, negative emotions can be prevented by controlling emotion [8]. Therefore, teachers should be more aware of their students and their emotions. Emotion might be different from one culture to another, from one family to another, from a woman to a man [6].

According to the above discussion, role of emotion in electronic education systems is not deniable. Negative emotions convert a simple task into a difficult one; while positive emotions any difficult problem looks simple. Therefore, emotions are a double-edged tool [3].

An intelligent e-learning system should be able to adapt to the emotional needs of the user and this makes their learning experience better [2].

Frustration is the most comprehensive emotion associated with online education [9].

Several methods have been developed to detect users' emotion. These methods are based on different sources like image, audio, text and physiologic parameters. These methods require additional hardware. Such hardware is not always available and they are sometimes costly [10]. Therefore, a way should be found to detect user emotion without any additional hardware. On the other hand, emotions are not represented only via face and voice but they have behavioral

aspects also [11]. Emotion detecting via image and audio has 70-98% accuracy [11].

In recent years, using a tool with touch input has grown increasingly which is the result of suitable price of tablets and smart phones. Users of such devices are from different cultures; therefore, HCI plays an important role in designing such devices. Emotion of the user affects his touching behavior; therefore, emotions of the users should be explored to design such tools [10].

Studies show that touching behavior plays an important role in capacity (positivity or negativity) and intensity of emotion; For example, studies show that speed of touching behavior is higher when human is happy or angry and it is lower when human is unhappy or depressed [12].

1.2 Personal Type

Another important characteristic of human is personal type which affects many aspects of life. For instance, dynamic thinking skill [13], attention [4]; in fact, when online education environments are considered, there are different aspects which affect contribution of students where the personal type is one of the most important ones [4]. In addition, learning style have become one of the most attractive issues; Learning style, scientific achievements and learning objectives of different student groups in Internet are different. [14]. If personal type of people participating in electronic education is considered, this education method might be more effective for each personal type [15].

The question here is that how we can detect personal type. There is a lot of method to do that, we want to choose the best of these method in educational environment. Enneagram is one of the strongest methods in detecting personal types [16]. Enneagram is a neural pattern which specifies attention orientation, measures motivations and determines beliefs; while other models only describe how to collect and process data [17]. Ennea is a Greek word meaning 9. Structure of Enneagram seems difficult but it is very easy. To this end, Riso-Hudson Enneagram Type Indicator (RHTEI) questionnaire is filled first, then its results are used to draw a circle which includes 9 points. Each point represents one personal type [17].

It should be said that each person has a constant personal type which does not change [17]. In this study, it is tried to detect user emotion in education environments especially in multiple-choice tests only from user's touching behavior; multiple-choice tests are one of the most common and popular test in world and as it is known, quantity and quality of user's touching behavior in multiple-choice test environment is much different from other environments like online games; therefore, a particular study in this context is required. Then, considering personal type of people, it is tried to improve emotion and efficiency of persons.

There exist many systems for personal type where one of the most reliable systems is Enneagram which has shown its efficiency in education environments considering different studies. To this end, Enneagram system is used here; first, personal type of the user is determined using Riso-Hudson Enneagram Type Indicator (RHTEI) questionnaire there are 114 question that users have to answer them. It looks like it is a lot but its precision is very high. Each user initially answers these questions and is classified into one of the 9 categories.

1.3 Literature Review

There are a lot of studies in these fields that it's needed to understand the elementary concepts. We choose the newest and the most relevant one to our work. At first we bring some studies that are about emotion detection and its method. There are a lot of methods and we focus on some methods that use touch behavior. After that we bring some studies that discuss personal type in educational environment.

In [1], a method is proposed to explore boredom using mouse movement. These movements are directly related to user emotion. Especially, orbit, speed, intervals of immobility and direction might specify user condition. C4.5 algorithm is used which can be used to build decision tree. Classification accuracy is 90%.

In [18], pressure sensor on the keyboard is device used to explore user emotion. Data is collected from 50 volunteers. First, each volunteer watches a video or listens to a short track about each emotion (neutral, angry, fear, happiness and unhappiness) and then starts

writing his comment about the story. Accuracy of this method is 9.8%.

In [19], purpose is to find relationship between confusing and mouse movement. In order to collect data, a simple computer game is designed. Features include distance, speed, direction and change in direction. In order to classify, four known algorithms including SVM, Logistic regression, Random Forest and C4.5 are applied. Then, SVM and logistic regression are executed and their F-score is obtained equal to 0.96.

In [20], Bayes Point Machine is employed to explore user frustration. Data is collected from users using the sensors installed on a mouse. This mouse has 8 pressure sensors which can collect information pattern of the user. Average error rate in this method is 11.87%.

In [21], user emotions are explored through biological signals and discusses impact of emotions on learning procedure. It discusses which responses and reactions to emotions might develop learning process. SVM is used for classification, accuracy of obtaining emotions is 86.35. Efficiency of the user after reacting to user emotion is 91%.

In [22], online and offline detection of user emotions is presented. In the offline method, MIT Media method is improved which includes detection through physiological data collected from each persons during several weeks. Success rate has increased from 50.62% to 81.25%. In addition, an online method is established. Therefore, it is useful for real-time applications.

Authors of [23] claim that data of interaction with mouse and keyboard can be used to detect emotion like physiologic signals. Features like number of pressing a key, average time of pressing the keys, average time between pressing two keys and number of times that a specific key is pressed (specific keys like Backspace and …) for keyboard; number of clicks and distance between two clicks for mouse are used. Then, C4.5 algorithm is used to classify data. Results show that semantic analysis has the best result but when mouse and keyboard are combined, results are better.

In [24], it has been shown that body movement like arm movement might represent his mental processes.

But all these studies have used additional hardware which has two main problems. Such

hardware is not always available and the second problem is related to cost of such hardware; therefore, studies are oriented towards detecting user emotion without requiring any additional hardware. Several studies are also performed in this context.

In [10], an approach is proposed to detect user emotions using touch input. A triple classification of emotion is presented including positive, negative and neutral emotion; then a set including 7 features is presented to explore these three states. The final proposed model is a linear combination of these 7 features. Evaluations show that detection accuracy is 90.47%.

In [25], purpose is to create an easy model for predicting user state via touch displays. Prediction is performed based on user touch input called finger stroke. 7 features are defined for stroke; a linear combination of these features is introduced as predictor which can detect three states; Positive (happiness, pleasure, being excited), negative (unhappiness, being angry, and fear) and Neutral (calmness, relaxation) (Shah, Teja, & & Bhattacharya, 2015). To this end, data is collected from 57 participants. Prediction accuracy is 90.47%.

Here, a series of studies on relationship between personal types and education are investigated.

Finding relationship between behavior and personal type of the learner in education environment based on web is very important. Authors in [26] presented a new concept called personality mining to find depth of relationship between personal type and data obtained from behavior. First, a learner model including personal model and behavior model is proposed.

In [23] Enneagram is introduced as a new approach for determining learning styles. This paper describes learning styles which are widely used in engineering and then tries to offer a new education style based on Enneagram which is an analytical-physiological model for personal types.

Today, students are motivated to participate in group works to solve complicated problems and increase communication skills; but conventional classification strategies cannot operate well in e-learning because there is no or small physical interaction. In [27] a computer-based classification strategy is presented which operates based on typologies and neuro-linguistic programming (NLP). Student typology

is obtained through Enneagram with Riso-Hudson Enneagram Type Indicator (RHETI) test. NLP is also obtained through tracking pupil based on eye movement pattern. Results show that members which are classified in this method establish more and better communications and result of their group work is better; this is the result of member's compatibility.

In an online education environment, different aspects of the environment like nature of activities and resources, employed technology and characteristics of learners should be considered to increase education quality. An important aspect of characteristics of an individual is his personal type. Results show that attention of people is proportionate to their personal type. In (Ainslie, 2003), personal types including introversion/extraversion, sensing/intuitive and logical/emotional are studied in particular.

In [13], personal type of individuals measured by Myers-Briggs Type Indicator (MBTI) test and its relationship with thinking skills in students is investigated. 45 cases between 17 to 18 years old are selected. They should respond to a test and questions of MBTI test. Results show that there is a great difference between different personal types with dynamic thinking skill. Results of this study verify importance of personal type for educational activities.

2 MAIN WORK

In this section we explain our proposed approach completely. This part includes two sections; in the first section user emotions are detected only based on user interaction with touch screen like smartphone and tablet using a proposed feature set and in the second section negative emotions of users are improved considering their personal type.

2.1 Emotion Detection

First problem is selecting a suitable emotion classification for this study. In [28] a study is conducted which has classified most repeated emotions in educational environments. According to [28], test anxiety is the most repeated emotion of students and among other emotions, frustration and boredom can be mentioned. Accordingly, three main emotions

including anxiety, frustration and boredom are considered in this study.

After that we need a way to gather user touch behavior. Tables 1 to 4 represent a part of useful data.

Table1 **.** touchDown function information

Function name	touchdown(id,x,y)
Explanation	Touch on the point(x,y) and set the event id.
prams	id: the id you specified for this event. x: the x-coordinate you want to touch down at. y: the y-coordinate you want to touch down at.
Examples	touchDown(0, 100, 200);

Table 2. touchMove function information

Function name	touchMove(id,x,y)
Explanation	touch move to the point(x, y)
params	id: the id your touch continues from. x: the x-coordinate you want to touch move to. y: the y-coordinate you want to touch move to.
Examples	touchDown(0, 100, 200);

Table 3. touchUp function information

Function name	touchUp(id,x,y)
Explanation	touch up the specified event with the "id"
params	id: the id your touch continues from. x: the x-coordinate you want to touch up to. y: the y-coordinate you want to touch up to.
Examples	touchUp(0, 100, 200)

Table 4. Usleep function information

Function name	Usleep(microseconds)
Explanation	Sleep the process for microseconds.
params	microseconds: the time you want to sleep for
Examples	usleep(1000000)

Now, it is required to extract required information from above data. There are many features on touching behavior of users but we need the highest accuracy and efficiency features. To this end, a set of features including 21 features is selected. You can see these 21 features which is given along with a simple formula of features to better understand the features.

1-Counter of multi touch
    If (TouchUp)
        If (TouchDown&& TouchMove)
            Coutermultitouch +=1

2-Counter of single touch
    If (TouchUp)
        If (TouchDown&& TouchMove)
            Countersingletouch
        +=count (TouchMove)

3-Number of tap
    If (TouchUp)
        If (TouchDown&&!TouchMove)
            Numbertap+=1;

4-Sum of time of multiple touch
    If (TouchUp)
        If (TouchDown&& TouchMove)
            Sumtimemultitouch=sum
        (usleep)

5-Time of Tap
    If (TouchUp)
        If (TouchDown&&! TouchMove)
            Timetap=usleep()(between down and up)

6-Total time of task
    Totaltimetask=sum (all Usleep)

7-Sum of distance
    If (TouchUp)
        If (TouchDown (z,x,y) && TouchMove(z,x2,y2)),
            $px=((x1-x2).^2);$

            $py=((y1-y2).^2);$
            Distance=sqrt (px+py);

8-Minimum of distance
    Min (D)
9-Maximum of distance
    Max (D)
10-Mean of distance
    Mean (D)
11-Mid of distance
    Median (D)
12-Sum of time
    If (TouchUp)
        If (TouchDown (z,x,y), && TouchMove(z,x2,y2)),
            Time+= (Usleep);
13-Minimum of time
    Min (T)
14-Maximum of time
    Max (T)
15-Mean of time
    Mean (T)
16-Mid of time
    Median (T)
17-Sum of speed
    Speed=Distance/ (Time);
18-Minimum of speed
    Min(S)
19-Maximum of speed
    Max(S)
20-Mean of speed
    Mean(S)
21-Mid of speed
    Median(S)

2.1.1 Emotion Induction

For detection emotion, in train phase, it is tried to arrange a condition that the intent emotion (Anxiety, Frustration, Boredom) is induced to the user; since these emotions may differ based on external factors, we did these tests in a same situations without any distraction for all users: at the same time, in a silent room and without give any information to user. We try to ready a condition that only personal type can affect user's emotion not external factor. To this end, a three-part exam is designed that each part is related to one of the intent negative emotions. User should read an English passage and then answer the corresponding multiple-choice questions. In the following, each part of the test is described.

Anxiety: in this part we create a condition to make the user anxious, the user should try to achieve the highest score in shortest time to obtain a reward. A time is considered shorter than average time required for answering the questions; in addition, negative score is also considered for this step. In the user interface, time box is shown to the user. As the time is decreased, the color of the time box also changes from white to yellow and red. A music is also plays along with this process which its rhythm changes based on time. Then, in the middle of the exam, the user is asked to select a number between 1 and 5 for his anxiety level (1 is the lowest level and 5 is the highest level).

Frustration: in this part we create a condition to make the user frustrated, first the user is informed that all questions of this step should be answered correctly and even by one incorrect answer, the whole score will be lost. Then questions are designed such that the user responds the first question incorrectly; therefore, the user knows that he has lost score of this step but he should answer all questions of this step to go to the next step. In the middle of the exam, user is asked to select a number between 1 and 5 for his frustration level (1 is the lowest level and 5 is the highest level).

Boredom: in this part we create a condition to make the user bored, at the end of processes and after observing tiredness of the user, a long exam is taken from the user; in the middle of the exam, the user is asked to select a number between 1 to 5 for his boredom level (1 is the lowest level and 5 is the highest level).

2.2 Personal Type

If we intend to increase efficiency of user in online education systems, after detecting emotion of the user, we should have an approach to improve negative emotions. In this step, after detecting emotion of the user, negative emotion of the user should be balanced. But this task is very complicated and professional and it is not as easy as showing a few images or playing a music track. In fact, it can be said that approaches differ from one person to another and these differences cannot be ignored and the personal characteristics should be considered; one of the most important personal characteristics is personal type; studies show that

personal type affects different aspects of life and it is one of the most important aspects of human life. In this part, focus is on anxiety, it means we try to balance user anxiety; since To eliminate boredom, physical methods are appropriate to mental methods like walking, it is neglected in this study and frustration will be remained for future works. As mentioned before, we need an effective method to detect personal type of people. There are many systems to detect personal type and the most reliable one is Enneagram which has shown its efficiency in educational environments as we explained some of them in Literature Review section.

3 RESULT

Statistical population of this study includes men and women between 18 to 30 years old. This study is conducted in Kermanshah between 2017 and 2018. Statistical sample includes 51 men and women from Razi University of Kermanshah.

There are two main sections, in the first section we will show the result of emotion detection using our method and in the second section we will show the result of improved user efficiency using our method.

3.1 Emotion Detection

As we explained in 2.1 section, a features set was selected included of 21 features. We selected features that gave us the most accurate results. Now we need to detect the user emotions using this features set.

To realize the conditions described in section 2.1.1, an android application is designed and developed by Android Studio. This application is comprised of three sections where each section is designed for creating and inducing a specific emotion (Inducing emotion was described in the previous section).

First, the user is asked to perform the sections in order of anxiety, frustration and boredom. In order to generalize the test and employ students of other field of study, topic of the test is English Language. Each exam is comprised of an English passage and 4 multiple-choice questions. AutoTouch is activated simultaneously to record touching behavior of the user. In the middle of each exam, the user is asked to select a number between 1 and 5 for his emotion level.

In total, data is collected from 43 students of Razi University of Kermanshah from different fields. Each user is tested 4 times. Then, received data is converted to 21 intent features; several known algorithms are used to classify data using of our features set and the results are given in tables 5 to 7. For data classification, weka is used. 70% of data is train data and 30% is test data.

Table 5. Anxiety detection results

	F-Measure	Recall	Precision	Correctly Classified Instances
BayesNet	0.689	0.727	0.655	0.727
SMO	0.636	0.636	0.636	0.636
NaiveBayes	0.511	0.455	0.587	0.455

Table 6. Frustration detection results

	F-Measure	Recall	Precision	Correctly Classified Instances
BayesNet	0.791	0.857	0.791	0.857
SMO	0.757	0.714	0.705	0.714
NaiveBayes	0.623	0.571	0.686	0.571

Table 7. Boredom detection results

	F-Measure	Recall	Precision	Correctly Classified Instances
BayesNet	0.495	0.636	0.405	0.636
SMO	0.495	0.636	0.405	0.636
NaiveBayes	0.911	0.909	0.927	0.909

3.2 Improve User Efficiency

After detecting emotion of the user, the purpose is to improve the user efficiency considering his personal type. As mentioned previously, an exam including English questions is designed in which the user should answer multiple-choice questions and achieve a score based on his correct answers. To this end, users are divided into two groups and two specific orders are considered for each group which are described in the following.

Group with council:
• Performing the first section which is designed to induce anxiety
• Specifying anxiety level using a number between 1 and 5 by the user (the first number)
• Receiving some recommendations and advices considering personal type of the user (these advices are prepared by a psychologist and for each type of personality is different. The purpose of these advices is to balance the level of anxiety of the user.)
• Performing second section of the exam which is like the first section for inducing anxiety
• Specifying anxiety level using a number between 1 and 5 by the user (the second number)
At the end of exam, each user has two numbers that indicate the level of anxiety of the user.

Group without council:
• Performing the first section which is designed to induce anxiety
• Specifying anxiety level using a number between 1 and 5 by the user (the first number)
• Performing second section of the test which is designed like the first section for inducing anxiety
• Specifying anxiety level using a number between 1 and 5 by the user (the second number)
At the end of exam, each user has two numbers that indicate the level of anxiety of the user. In this group there is no advice like the previous one.

First of all, the purpose is to determine difference of the second number (anxiety level) between two groups. As can be seen in Figure 1 and 2, anxiety level is reduced in both groups which is because the exam is repeated but anxiety level in the group with council is significantly lower; that is, after receiving recommendations based on their personal type they become able to overcome their negative emotions and experience a more positive emotion.
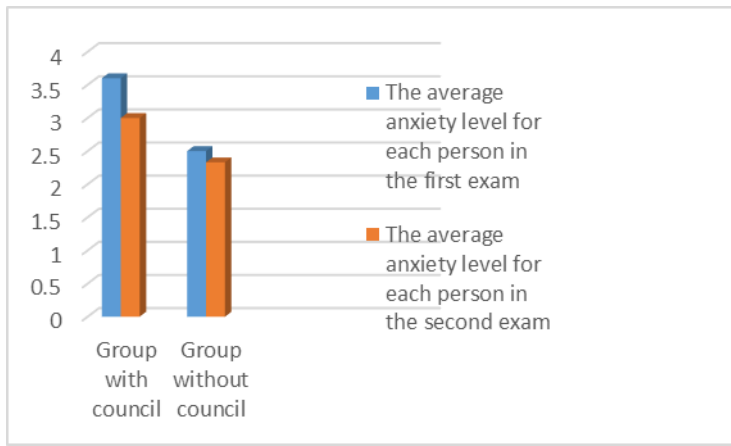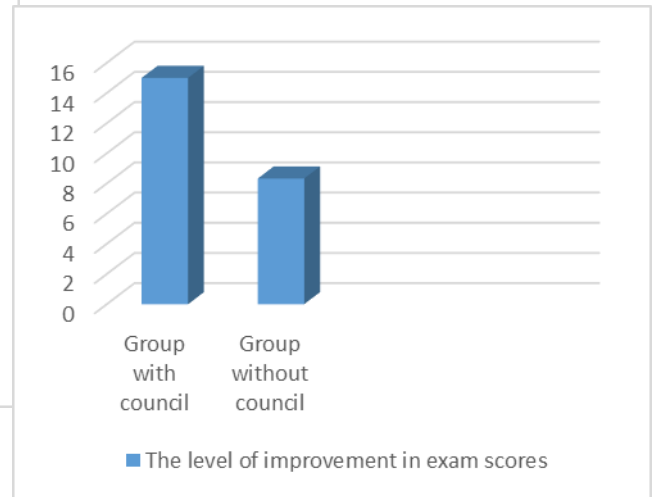
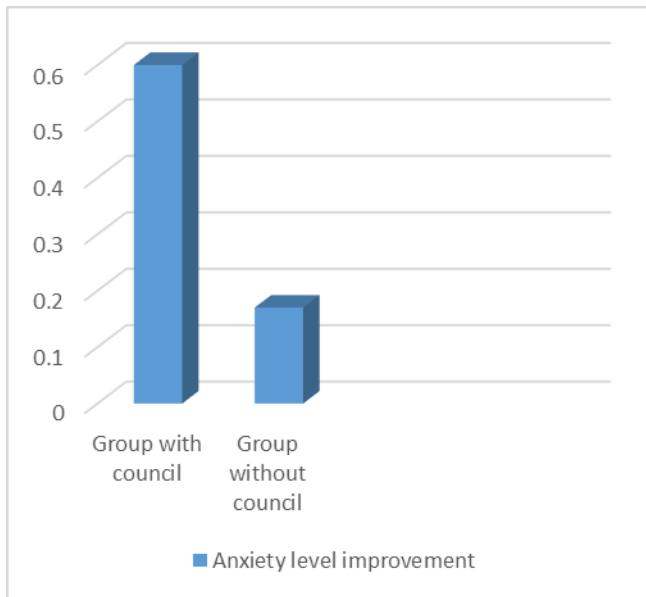**Figure 1**: The average anxiety level for each person

Figure 2: Anxiety level improvement

Now, we want to show the result of improved user efficiency using our method. As can be seen in Figure 3 and 4, average exam score of the people in the group with council has increased more than the group without council.
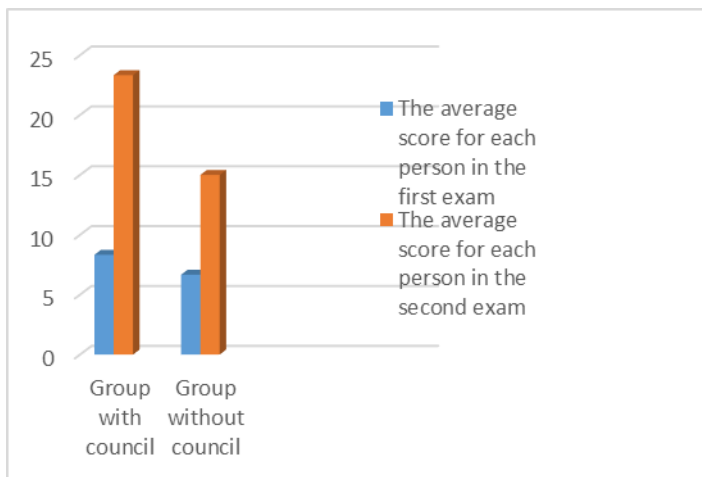

Figure 3: The average exam score for each person

Figure 4: The level of improvement in exam score

3.3 Statistical Result using SPSS

In order to perform accurate and scientific statistical analyses on obtained results, in this section SPSS is used to verify significance of the results.

We compare two groups over both anxiety level and exam score.

Some data of each group is known as outlier. In general, 18 instances from each group and a total of 36 instances are investigated. Table 8 contains descriptive data including number of samples, minimum, maximum, mean and standard deviation of scores. Then, information regarding difference of pre-test and post-test scores are given in tables 9 and 10.

Table 8. Descriptive data

Group		Standard deviation	Avg	Max	Min	Num
Group with council	Pre-text-anxiety	1.092	3.61	5	1	18
	Post-test-anxiety	1.451	3.11	5	1	18
	Pre-test-score	16.997	7.78	40	-20	18
	Post-test-	18.7257	22.778	40	-10	18

	score					
Group without council	Pre-text-anxiety	1.339	2.50	5	1	18
	Post-test-anxiety	1.339	2.17	5	1	18
	Pre-test-score	17.311	9.44	40	-20	18
	Post-test-score	14.2457	11.667	40	-10	18

Table 9. Descriptive data on the difference between pre-test and post-test anxiety in two groups

Group		SD	Avg	Max	Min	Num
Group with council	Difference of emotion	0.98	-0.55	1	-2	18
Group without council	Difference of emotion	1.53	-0.33	1	-4	18

Table 10. Descriptive data on the difference between pre-test and post-test scores in two groups

Group		SD	Avg	Max	Min	Num
Group with council	Difference scores	16.89	15	50	-10	18
Group without council	Difference scores	12.62	2.222	20	-20	18

The U Mann-Whitney test relates to the significant difference in anxiety level and exam scores in two groups with council and without council are shown in tables 11 and 12.

Table 11. The U Mann-Whitney test relates to the significant difference in emotion level in two groups with council and without council

	Difference of emotion
Mann-Whitney U	133.500
Wilcoxon W	304.500
Z	-0.931
Asymp. Sig (2-tailed)	0.352
Exact Sig. [2*(1-tailed Sig.)]	0.372

Table 12. The U Mann-Whitney test relates to the significant difference in exam scores in two groups with council and without council

	Difference scores
Mann-Whitney U	94.000
Wilcoxon W	265.000
Z	-2.206
Asymp. Sig (2-tailed)	0.027
Exact Sig. [2*(1-tailed Sig.)]	0.031

As the results indicate, in case of emotion level (table 11) although there is difference between scores of two groups, but it is not significant (P>0.05). It means there is difference between two groups but we need to consider some other factors that probability affect results.it is our future work to consider these factor. In case of exam score, as results show, difference of pre-test and post-test scores of the group with council (average of 15) is significantly (P<0.05 in table 12) higher than the group without council (average of 2.22). It means the user efficiency has been improved significantly with our proposed method and in this case we could

affect the score of the second group with our consults based on personal type.

4 CONCLUTION

In this study we have improved the user efficiency in electronic education environment considering emotion and personal type of users. We identified user emotion from touching behavior of the user on touch devices like tablets or smartphones. Then considering personal type of people, it is tried to improve emotion and increase personal efficiency. To this end, first of all, the user emotion was detected using proposed features set included 21 features; when the user emotion was detected we tried to improve negative emotion considering personal type of the users. Enneagram is used to detect personal type of user that has shown its efficiency in educational environments. Our results showed that we were able to detect the user emotion with the high accuracy and also improve the user efficiency significantly with our proposed method.

5 RECOMMENDATION

With our proposed approach electronic learning can become close to traditional learning and it can have the benefits of traditional learning and at the same time benefits of electronic leaning environment because it can be available in any time and place and also it can be interactive like traditional learning environment considering emotion and personal type.

In term of feasibility of the proposed approach, there is no any specific equipment, all things that we need is a smartphone or a tablet that are very common anywhere so our approach can be done easily with minimum efforts.

Limitation:

We directly deal with emotions that is very sensitive topic. For working on this topic it's needed to control many factor to get the correct and accurate result.

As we did it, in this study a psychologist is required to help.

6 FUTURE WORK

Taking some other emotions into account can be helpful to improve e-learning, we evaluated three of the most important emotions. However there are some others that can be evaluated in a future work.

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