Research on the Identification of Emotional Tendency in the Intelligent Composition Evaluation

Yue TONG* and Jian-She ZHOUa
Capital Normal University, Research Center For Language Intelligence of China, Beijing 100048, China
*tongyue0816@126.com, *zhoujs@cnu.edu.cn

Keywords: E-learning; Composition evaluation; Psychological health; The Identification of Emotional Tendency.

Abstract. Emotional evaluation is an important reference data for intelligent teaching, by evaluating the student's emotions, it is possible to analyze whether his temporary psychological state is the best learning state. And whether his constant psychological state is positive and healthy or not, does he have a psychological problem? We propose an emotion evaluation system which is quantitative and suitable for computing after the investigation of pedagogy, developmental psychology, group psychology, and humanistic psychology for intelligent composition evaluation to assess on student's psychological state. We will explain in this paper how to evaluate students' emotion through emotion evaluation system.

Introduction

The high development of the Internet has brought about great changes in the field of teaching. Since the 1970s, more attention has been paid to intelligent teaching which relies heavily on data and algorithms to realize personalized and adaptive education. It acquires different characteristics by data existing and acquires Preset logic scheme by algorithms. Different from the traditional teaching mode, intelligent teaching adopts personalized teaching strategy to carry out the teaching based on students' weak points, which no longer limited by time, place and teacher resources. Students can learn online anytime, anywhere and relieve teachers' pressure at the same time.

Intelligent composition evaluation has been greatly developed in recent years as the key points of intelligent teaching, which evaluates the lexical choice, grammatical collocation, rhetorical devices, discourse theme, logical framework and emotional expression in the composition by computer technology in one to three seconds. According to the different stages of the writer to give different scoring standards and modify opinions with the advantages of accuracy and efficiency which can dig out students' blind spot that the teacher is not easy to discover. At present, there are many composition evaluation systems on the market, for example, the “Correction Network” for English compositions and the “IN Class” for Chinese compositions which correct the compositions online based on cloud computing. But there is few evaluation system to inspect emotion problems in compositions.

K12 students whose mental state is in the unstable and turbulent period before maturity are in adolescence, it is easy to get impulsive, extreme and even rebellious when dealing with family, love affairs, relationships among classmates and other issues, they may generates loneliness, confusion, depression, depression, anxiety and even decadence, depravity and other emotions due to the lack of practice, so it is important to pay attention to the psychological and emotional problems of adolescent students.

The Evaluation Dimensions for Mining Emotion in Compositions

Based on the demand of emotion recognition and evaluation technology for students’ psychological health, through the investigation of pedagogy, educational psychology, developmental psychology, human psychology, group psychology and other fields, restricting
natural language processing as the practice domain, based on the principle that computers can be identified, operated and quantified, with the goal of helping students mental develop healthy. Professor Zhou jian-she, the head of China language intelligence research center, proposed a 4 -dimensional emotion evaluation system: The emotion of belief, security, pleasure and caring, which is mainly used to evaluate students' psychology healthy state over a period of time. There are many kinds of emotions that affect students' psychology state, but we only need these emotions that could be processed on a computer. In terms of personal psychological literacy, whether they can trust the world, and have the correct values and outlook on life, if they feel safe and relaxed about their surroundings, whether they feel relaxed and happy or not; In terms of interpersonal psychological literacy, if they show moderate concern and compassion for others.

The emotion of belief refers to the recognition and value evaluation of oneself or surrounding people, things and events. From the perspective of developmental psychology, it is the basic contradiction that the baby faces after birth, a baby's first emotion about the world is trust or distrust. if they get enough milk from their mother and care in time, they will have a sense of trust; If they are not given the care they need, negative feelings of distrust would appear. According to the group psychology, the emotion of belief involves loyalty to the group, people with a sense of identity are more likely to serve the community, only by identifying with one thing can they practice it better, sometimes they can even sacrifice their own interests to maintain the beliefs they identify with. Only when students identify with the class, can they integrate into the group, love the group, and have a sense of belonging to the collective, lacking of identity will lead to apathy and isolation from the group. The emotion of belief can be divided into 7 levels according to the intensity of emotional expression: reverence - approval - identity - neutral - disagreement - opposition - protest.

The emotion of security refers to the analysis and anticipation of physical or psychological risks might be appeared and the prediction of an individual's ability to cope with external events. Humanistic psychology believes that security is the basis for the development of children's mental health and the completment of children's personality. Having a sense of security leads to confidence and self-esteem, to be more trusting and willing to interact and having harmonious interpersonal relationships; Lack of security can lead to the negative personality of low self-esteem, loneliness, jealousy, arrogance, distrust, and even hostility. Therefore, it is especially important to give students a pragmatic and safe environment for growth, and to create a relaxed and secure psychological atmosphere for students, students who are lack of guardian care or their parents were divorced, may have some mental illnesses or even personality disorders due to lack of security. The emotion of belief can be divided into 5 levels according to the intensity of emotional expression: peace of mind - reassuring - neutral - worried - fear.

The emotion of pleasure which is a kind of spiritual peace of mind and comfort, refers to the feelings of satisfaction and happiness as a reflection of the external things. Suhomlinski believes that if you want your children to be an educated man, you must first make them have the ability to be happy and look at the world positively. Makarenko believes that the purpose of education is not only to cultivate creative citizens who can effectively participate in national construction, but also to make educated people become a happy person. These opinions are similar with Ushinsky’s that the main purpose of education is to make the educated people happy. Optimistic people have a good self-awareness and social cognition, have a better ability to resist stress, and are easier to accomplish tasks, to achieve success, be more likely to have happiness; The pessimistic person's psychological endurance is weak, are likely to produce negative emotions such as depression, remorse, escapement, degenerate and world-weariness. So it is very important to cultivate students' positive and optimistic psychological quality and improve their happiness index. The emotion of belief can be divided into 5 levels according to the intensity of emotional expression: happiness - delight - neutral - sad - despair.

The emotion of caring refers to the caring, loving, and be compassionate to others, taking the initiative to put yourself in the other person's shoes. Students who actively care about others are more inclined to have good interpersonal relationships, are easier to deal with conflicts, are more
inclined to have abilities of organization and leadership. While caring for others, they are also likely to be loved in turn, more likely to obtain happiness with care about each other, which is beneficial to mental health. So it is important to cultivate students’ sense of caring, paying more attention to others, helping others actively, and creating a good and harmonious relationship between teachers and students and between the classmates. The emotion of belief can be divided into 5 levels according to the intensity of emotional expression: love - care - neutral - indifferent - destruction.

Due to the students in different grades have different performance on four emotions, when evaluating the emotional tendency of the composition, we will consider a series of parameters such as the age, gender and family background of the students.

**Experiment Design**

We choose the method based on the combination of emotion dictionary and deep learning to mining and analyze the emotion in the composition. First of all, the text should be word segmentation, after which the words can be compared with other words in the emotion dictionary and calculate their similarity. Conducting the noise reduction after word segmentation, using TF-IDF and other methods to filter out words that are not related to subjective emotions. Secondly, search for emotional words and phrases based on the dictionary of emotion, these are belief dictionary, security dictionary, pleasure dictionary and caring dictionary. The co-occurrence dictionary and conjunction dictionary are used to search emotion words and phrases and obtain the static emotion weight of emotion words, the adverbs dictionary and negation dictionary are used to obtain dynamic affective weight, add emotional weight to the title, opening and closing sentences. Thirdly, mining the theme, emotion evaluating subject, emotion tendency, emotion polarity, emotion degree, emotion evaluating object and other emotional elements in the composition. Finally, transforming sentiment analysis into text vector problems through support vector machines, classify and calculate the emotional tendencies in composition. Mark the problems in composition and give constructive comments, then give it an appropriate grade. Then compare the emotion statistics out of the composition with the standard student's mental health statistics, if the statistics are regular, the evaluation is over; and if the statistics are irregular, the intelligent evaluation system will give some positive guidance comments, warning to teachers and parents meanwhile, end the evaluation. Please refer to Fig.1 for the details of identification and evaluation of emotional tendency on compositions.

![Figure 1. Emotion Evaluation System on Compositions.](image)
Conclusion

Adolescent mental health problems are the main factors affecting the quality of teaching. It is an important method to obtain the statistics of students' psychological problems according to mining and calculating the emotion characteristics in the composition. We propose the emotion of belief, security, pleasure and caring as a 4-dimension of emotional evaluation system, to evaluate whether students' emotional state is healthy, whether there is a psychological problem from the composition they have written. If a problem has been detected, the system will give a warning. In view of the important role of emotion identification and calculation in students' learning state and psychological development, we can predict the favorable application prospect of emotion calculation in teaching field. With the rapid development of Artificial intelligence technology, supported by huge corpus resources and complex algorithms, Emotional statistics will become an important resource in E-learning.

References