EMOTIONAL FEEDBACK IN ELEARNING INNOVATIVE DESIGNS IN THE ROMANIAN UNIVERSITY PROGRAMS

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Abstract: *Current literature indicates low levels of correlation between science students and emotional engagement during course interactions. While students enrolling humanistic courses tend to display higher levels of correlation with emotional states, it becomes important to identify the extent to which these classifications are gender related. The current investigation will address the first section, and will look at how gender influences emotional engagement of students enrolled in IT courses in a Romanian University. The literature to date highlights a positive correlation between female emotional feedback and academic engagement and a neutral or negative correlation between male students and academic engagement. To advance the discussion, a survey exploring factors of emotional predisposition has been emailed to students enrolled in a graduate programme at the University of Aurel Vlaicu, Arad. It is being hypothesized that gender has a determining influence on emotional relevance, and that results will indicate that academic engagement grows exponentially with female emotional feedback.*

Keywords: *elearning design; FER; emotional feedback; basic emotions; emotional engagement;*

1. Introduction

The following presentation aims to interpret the collected results and suggest further integrations of the framework.

2. Experiment design

A questionnaire set of twenty four questions was emailed to twenty four students enrolled in a second year graduate Information and Security Class, at Aurel Vlaicu University in Arad. The purpose of the experiment is to investigate the relevance of the social-media communication to elearning communication. The main objective consists of observing the types of correlations between the informal socio-emotional paradigms and the formal digital academic communication. The observed parameters, include both the student-to-student and the student-to-professor written communication channels. The questionnaire format incorporates a five point Likert scale design exploring the cognitive dimension of the emotional state and a fifty five emoji independent object set, designed to explore the instinctive emotional reaction to the same stimulus. The Likert section is configured to accept check mark votes, while the emoji section is designed to accept any of the fifty five objects associated with emotions, gestures and objects. The emoji set is available in the MOODLE 3.3 version update, and represents one of the most recent updates available for open source elearning platforms. The responders' range covers ages from 22 to 54 and includes a total of 20 students, 18 males and 2 females. A number of 14 students fall in the age group 22-30 (12 males and 2 females), followed by ages 31- 40 (4 males), and respondents within ages 41- 51+(2 males). Students were required to fill out the questionnaire on the grounds of

"improving the educational act in the digital era," with the stated objective of "calibrating elearning programs via emotional feedback design."

No. Crt.	Totally Irrelevant	Somehow Relevant	Neutral	Considerably Relevant	Highly Relevant
1.	○	○	◉	○	○
2.	😡	👎	😬	😱	👋🎩

3. Data processing and interpretation

Each answer is labeled and classified for the exploration of the cognitive side of the affect on the Likert scale, and for the emotional values of the affect, through the six basic emotions.

1. How do you evaluate the applicability of social-media emotional paradigms (ex. Facebook, Instagram) in the field of digital learning (ex. Moodle /other elearning platforms) through emojis? Males (11) and females (1) ages 20-30 and 41-51+ scored the most votes on happiness with 12 positive emojis labeled as happiness, followed. Considerably relevant ranks with (6m), while feeling mischievous (5m) and positive hand gestures (3m). Neutral r aggregated 11 votes (9m - 2f) and neutral e (2m) Of the negative valences, somehow relevant, ranked the highest with (3m) votes, totally irrelevant (1m), disgusting (1m) and a negative gesture (1f) define the scenario. The aggregated result of both negative and positive valences indicate score of 26 positives versus 6 negative votes. The positive valence of the global sentiment indicates a positive correlation between emoji communication and elearning. (6neg-11neut-26pos)

2. To what extent do you find emotional manifestation useful in the academic environment?

The largest number of positive 17 votes goes to happiness (9m-1f) and extremely relevant with 1 vote (1m), followed by considerably relevant with 6 votes (5m-1f). The next 12 aggregated neutral votes comprised of 9 neutral r votes (8m-1f), neutral e (1m), surprise (1m) and surprise (1f). The list continues with an aggregated negative score of 8 votes, comprised of the highest negative of somehow relevant with 4 total votes (4m), disgust (1m), fear (1m), sadness (1m) and and a negative gesture (1m). The sentiment score of 17 positives to 8 negative indicate a positive correlation between emotional exteriorization and the academic environment. (8neg-12neut-17pos)

3. Which emotional expressions (min. 3 emojis) would you most comfortably use during elearning classes? Evaluate their relevance for the current class.

On the positive valence one may note the aggregated positives ranking at 50, with the highest of 17 happiness votes (16m-1f), followed by positive gesture 12 (10m-2f), considerably relevant (8m), feeling mischievous (6m) feeling admiration/respect (4m) extremely relevant (2m) and feeling strong gesture (1m). Of the neutral valence, neutral r (2m) neutral e (3m), neutral e (1f) and surprise (2m). The negative valences resulted in an aggregated negative of 11 votes, with anger (2m), fear (2m), sadness (2m) and 5 votes for feeling negative gesture (3m-2f). The sentiment score of 50 positive and 11 negative is a strong case, primarily because even if all neutral votes turn negative, the positive valence still remains dominant. This indicates a positive correlation between the intent and comfort of using emojis in the context of elearning classes. (11neg-8neut-50pos)

4. Enumerate one emoji stringset (3-5 symbols) that you would most likely use in the academic relationship with the professor and insert in the most relevant box.

The positive valence is led by an aggregate sentiment score of 44, with happiness (17m), positive gesture 11 (9m-2f), considerably relevant (6m), feeling mischievous (5), extremely relevant (2), feeling positive object 2 (1m-1f), admiration/respect (1f). Neutral states are expressed by neutral r (4m), neutral e (4m) and surprise (4m). The negative valences aggregate a total of 21 votes, with sadness (7m), somehow relevant 7 (6m-1f), fear (2m), anger (2m), negative gesture (2m) and totally irrelevant (1m). This question seeks to explore the status of informal communication between students and professors within a formal setting, and finds a positive correlation between the two. (21neg-12neut-44pos)

5. Enumerate one emoji stringset (3-5 symbols) that you would most likely use on the elearning forums in the academic relationship with the colleagues.

The aggregated data indicates a total of 42 positives, with happiness 17 votes (16m-1f), considerably relevant (8m), feeling mischievous (7m), positive gesture (7m), extremely relevant (1m), positive gesture (1m) and admiration/respect (1f). Neutral scores indicated neutral r 10 (9m-1f), neutral e (2m), surprise (2m). On the low end, the aggregated values indicated a total of 15 votes, with sadness 6 (5m-1f), anger 5 (4m-1f), fear (2m), disgust (1m) and negative gesture (1m). The final results indicate with a score of 42 positive to 15 negative a high degree of comfort in using emojis in the academic exchange between colleagues, resulting in a positive correlation between positive emojis and student-student communication. (15neg-14neut-42pos)

6. Generally speaking, how important is/would be the emotional feedback in the field of digital education?

The aggregated positives count 30 votes, with highest number on happiness with 12 votes (11m-1f), considerably relevant (9m), feeling mischievous 4 (3m-1f), positive gesture 4 (3m-1f) and extremely relevant (1m). Neutral votes rank at neutral r at 6 votes (5m-1f) and surprise (2m). The negative valences have an aggregated number of 5 votes, with somehow relevant (3m), totally irrelevant (1m), irony (1m). The score rapport of 30 positives to 5 negatives, indicates a positive correlation between the relevance of emotional feedback and that of digital education. (5neg-8neut-30pos)

7. To what extent do you find relevant the acknowledgement and validation of the classmate's sentiments towards a successful academic itinerary? Using emoji (2-3 symbols) please express a few emotional states that would help achieving this goal.

The positives indicate and aggregated score of 50, with happiness 19 (18m-1f), feeling mischievous (9m), considerably relevant (8m), positive gestures 7 (5m-2f), admiration respect 3 (2m-1f), extremely relevant 2 (1m-1f) and feeling positive object (2m). Neutral values ranged from neutral r 8 (7m-1f), neutral e 3 (2m-1f), surprise (2m). Negative valences aggregated a total of 12 votes, with sadness 5 (3m-2f), somehow relevant (3m), anger 2 (1m-1f), fear (1m) and totally irrelevant (1m). The use of the positive symbols suggests and a positive to negative score of 50 to 12, and a positive correlation between classmates' sentiments and a successful academic journey. (12neg-13neut-50pos)

8. In the context of forum discussions associated with the class, would you find that emotionally augmented opinions would advance or detract the optimal development of the educational act? The positive valence has an aggregated score of 23 votes, with the highest on happiness (9m), followed by considerably relevant (5m), feeling mischievous (3m), positive gestures (3m), positive object (1m), admiration/respect (1m) and extremely relevant (1m). Of the neutral class, results indicate neutral r 4 (3m-1f) and neutral e 3 (2m-1f). The negative valences have an aggregated number of votes situated at 14, with the highest negative ranking of totally irrelevant 9(8m-1f), somehow relevant (1m), sad 2 (1m-1f) and irony (2m). The score indicates a 23 positive to 14 negative, and therefore suggests an on the edge positive correlation between the relevance of emotionally augmented opinions and the educational process.(14neg-7neut-23pos)

9. If the social media emotional paradigms would be implemented in elearning, their integration would be native or forced? Of the positive associations, the aggregated votes summ 18 positive, with the highest on happiness (8m), followed by considerably relevant 3 (2m-1f), feeling mischievous (2m) positive gesture (2m), positive object (2), admiration/respect (1m). Neutral r (7m), neutral e (4m) and surprise (1m). The negative valences have a total aggregated value of 16, with totally irrelevant at 7 (6m-1f), somehow relevant (2m), anger (2m), sadness (2m), fear (1f), negative gesture (1f) and irony (1m). The positive to negative ratio suggests a positive correlation but a slight change in neutral suggests a scenario of a negative type of correlation. (16neg-12neut-18pos)

10. Please make reference to a possible application of emotional feedback in IT security. How relevant can this aspect become for the future of digital education?
The positive values indicate and aggregated score of 21, with happiness (7m), positive gestures (6m), considerably relevant (5m), extremely relevant (1m), feeling mischievous (1m), positive object (1m), and admiration/respect (1m). Neutral values included neutral r 8 (6m-2f) and surprise (1m). The negative values aggregated a total number of 12 votes, with totally irrelevant (4m), somehow relevant (2m), disgust 1(m), anger (1m), sadness (1m), sarcasm (1m), irony (1m) and a negative gesture (1f). (12neg-9neut-21pos).

While all of the cases indicate, positive correlation between emoji use and academic design, the high scores of neutral in each scenario demands careful investigation. Prone to risk for negative correlation are the score scenarios returned by questions number two, four, eight, nine and ten. The vulnerable responses account for 50% of the total number of answers, and do not contradict the initial estimate of negative correlation between male students and academic engagement. Also, the initial forecast on the positive correlation between female emotional feedback and academic engagement, cannot be sustained. Students find manifest restrained interest in the emotional manifestation in the academic environment. The next point of concern appears to be the student-teacher communication, where students seem hesitant in using emojis in the written communication with the instructor. This dynamic may suggest that that the informal social paradigms of digital communication may not be fully relevant in the student-instructor communication. Regarding the discussion forums, it does not seem that the emotionally augmented opinions would significantly advance the education act. Referring to the top-down integration of social media emotional paradigms in elearning design, the responses seem to see this as a forced move. In terms of relevance towards IT security, students do not seem to find relevant applications of the emotional design. Due to the extended nature of the analysis, only half of the answers were evaluated. The survey was initiated and executed following the prior written acceptance of the university and in accordance with the GDPR anonymization rules.

4. INTEGRATION WITH INTELLIGENT NETWORKS

Emoji Sentiment Ranking v1.0

Char	Image [twemoji]	Unicode codepoint	Occurrences [5...max]	Position [0...1]	Neg [0...1]	Neut [0...1]	Pos [0...1]	Sentiment score [-1...+1]	Sentiment bar (c.i. 95%)	Unicode name	Unicode block
😍		0x1f60d	6359	0.765	0.052	0.219	0.729	0.678		SMILING FACE WITH HEART-SHAPED EYES	Emoticons
😃		0x1f603	1206	0.735	0.072	0.299	0.629	0.557		SMILING FACE WITH OPEN MOUTH	Emoticons
😴		0x1f634	718	0.850	0.422	0.237	0.341	-0.080		SLEEPING FACE	Emoticons
😡		0x1f621	756	0.862	0.532	0.108	0.360	-0.173		POUTING FACE	Emoticons

This type of labeling [1] allows for a precise classification of the sentiment score and it becomes particularly relevant when incorporated in recommender systems. Both the unicode codepoint encoding of emoji and the six basic human emotions are natively compatible with larger intelligent infrastructures. The basic human emotions identified as happiness, surprise, anger, sadness, fear, disgust and neutral [2], serve as the primary classes for classifying observable amygdala based reactions. This is not to be confused with neocortex' feelings which are conscious and self-reporting. The six basic human emotions find applications both in the academic and in the business sectors.

Also known as Facial Expression Recognition or FER, is a popular system capable of processing face expressions on three stages: (1) preprocessing database image and input face detection, (2) feature extraction, and (3) classification [3]. Emoji found in the digital corpus of any digital forums can easily supply unicode classes into the larger smart educational architecture. Theoretically, this can be accomplished by pairing emoji sentiment scores with Facial Action Units (AUs). Byoung, argues that facial action units (AUs) code the fundamental actions (46 AUs) of individual or groups of muscles typically seen when producing the facial expressions of a particular emotion [...] To recognize facial emotions, individual AU is detected and the system classify facial category according to the combination of AUs. For example, if an image has been annotated as having 1, 2, 25, and 26 AUs using an algorithm, the system will classify it as expressing an emotion of the 'surprised' category. (pp.3)

Referencing Benitez-Quiroz et. al (2016), Byoung presents the accepted geometrical emotional associations that become enacted in conjunction with emotional reactions:

Table 1. Prototypical AUs observed in each basic and compound emotion category

Category	AUs	Category	AUs
Happy	12, 25	Sadly disgusted	4, 10
Sad	4, 15	Fearfully angry	4, 20, 25
Fearful	1, 4, 20, 25	Fearfully surprised	1, 2, 5, 20, 25
Angry	4, 7, 24	Fearfully disgusted	1, 4, 10, 20, 25
Surprised	1, 2 , 25, 26	Angrily surprised	4, 25, 26
Disgusted	9, 10, 17	Disgusted surprised	1, 2, 5, 10
Happily sad	4, 6, 12, 25	Happily fearful	1, 2, 12, 25, 26
Happily surprised	1, 2, 12, 25	Angrily disgusted	4, 10, 17
Happily disgusted	10, 12, 25	Awed	1, 2, 5, 25
Sadly fearful	1, 4, 15, 25	Appalled	4, 9, 10
Sadly angry	4, 7, 15	Hatred	4, 7, 10
Sadly surprised	1, 4, 25, 26	-	-

The combination of various AUs can comfortably accommodate the wide range of emotional expressions associated with the growing number of emojis. Emojis can significantly contribute to the development of larger psychosomatic and cognitive maps and facilitate better decision making systems for the personalized learning models.
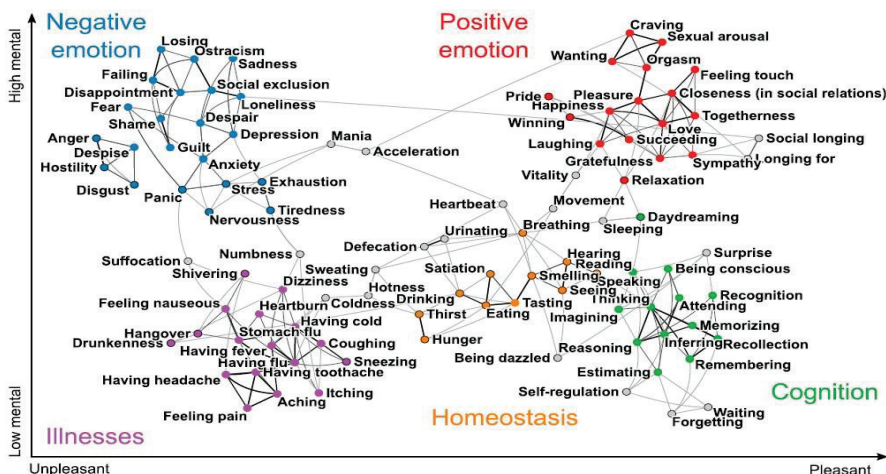
The map [4] suggests a comprehensive approach of the human ecosystem where emotions are interconnected with bodily functions and cognitive states. Theoretically, the design can be configured to account for the interlinked connections of emotion and cognition with student engagement and motivation.

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