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EMOTIONAL LABOR EXPERIENCED IN TEAM-PROJECTS: A COMPARISON OF ENGINEERING AND HOSPITALITY STUDENTS

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ABSTRACT

Team projects are an integral part of the student learning experience. However, emotions can significantly affect student performance during team projects. Students use different emotion regulation strategies, such as surface-acting (emotive dissonance) and deep-acting, to regulate their emotions during team projects. These strategies can result in different 'emotional labor' levels, leading to emotional exhaustion, dissonance, and burnout. The level of emotional labor may also vary depending on the discipline and the nature of the work. This study thus investigated if engineering and hospitality students have different levels of emotional labor in team projects. Data were collected using a modified Emotional Labor Survey from 90 engineering and 174 hospitality students in team projects at two European universities. The results showed a statistically significant difference in emotive dissonance between engineering and hospitality students. Engineering students experienced more emotive dissonance than hospitality students, suggesting they may need more support in regulating their emotions during team projects. These findings have important implications for educators. By understanding students' different emotional labor levels, educators can design interventions to help students regulate their emotions and improve their performance in team projects. Further research is needed to investigate emotional labor in engineering education.

1 INTRODUCTION

Team projects are essential for students to acquire the necessary skills for their profession in the future. Thus, it is crucial to ensure all participating students have a meaningful and enriching experience, gaining valuable skills, knowledge, and personal growth through team projects. However, many factors can affect students' performance in these processes (Isaac et al. 2023). Indeed, emotions, as well as cognitive, motivational, attitudinal, cultural, social or behavioral factors (Rasmussen and Jeppesen 2006), may be one of the factors that significantly impact student performance (Barczak et al. 2010) in team projects. For example, shared, positively valued emotions within teams enable engagement, cooperative team behavior, social integration, creativity, decision-making, and performance, while shared, negatively valued emotions limit them (Barsade and Knight 2015). Emotions, thus, can play a critical role in engineering team dynamics (such as emotional support) and the learning process of the teams.

However, both positive and negative emotions could be fruitful for the teams. For example, students must possess a minimum level of social collaboration emotions, such as warmth, which play an essential role in shaping the collective emotional experiences of the team. A sense of security is also necessary for students to make mistakes without fear of significant consequences. Further, power dynamics can be experienced emotionally, such as anger, and these emotions can intersect with differences in gender, culture, or ethnicity (Tormey 2021). On the other hand, although team projects allow students to acquire some critical skills, working on team projects may also intersect with students' personal and professional identities. For example, a study found that female students are less likely than male students to believe their ideas are respected in engineering student teams (Aeby et al. 2019). Such power dynamics could negatively affect the quality of team performance and students' emotional experiences in teams. In short, working on team projects is an emotional task that requires expressing, displaying, regulating, and managing all these emotions.

However, it is crucial to acknowledge that students might not feel at ease expressing their emotions due to the common cultural display rules requiring different emotional displays from different social groups, and cultures also value emotional displays differently depending on group membership (Bericat 2016). For example, in general, in Western cultures, and in particular in the engineering field, emotions are frequently viewed as a hindrance to rationality (Roeser 2012), and "being an engineer" means to be "non-emotionally demonstrative - trust in logic, analysis, and reason" (Godfrey and Parker 2010, 14-15). This view of rationality and the culture of engineering can result in the imposition of strict feeling rules that restrict the range of emotions one can express or display without experiencing significant social consequences such as a decrease in status and power (e.g., anger may be seen as righteous indignation in men or as a lack of rationality in women from ethnic minorities ['angry black woman' trope]). Hence, instead of displaying their feelings precisely, engineering students can fake, hide or suppress their emotions (Grandey 2003), resulting in 'emotional labor.'

Emotional labor is "the management of feelings to create a publicly observable facial and bodily display" (Hochschild 1983, 7). It is a term that describes exhibiting emotions that align with social and cultural norms and expectations, even when those emotions do not match individuals' true feelings. This term also involves changing one's emotions to better conform to those social expectations. There are several types of emotional labor (Chu and Murrmann 2006; Diefendorff et al. 2005). However, the two most commonly discussed are surface-acting and deep-acting (Grandey 2003). Surface-acting involves modifying one's outward display of emotions to conform to social norms or expectations without necessarily changing how one feels internally. For example, students might put on a polite smile while dealing with difficulty working on a team project, even if they feel frustrated or angry. On the other hand, deep-acting involves trying to change one's inner feelings to match the emotions expected in a given situation. This can be more challenging and can require a greater degree of effort than surface-acting. For example, students might try to cultivate empathy and compassion for a teammate in distress. In other words, students can work to get themselves to feel the emotion they are expected to display. As a result, students may have different emotional labor levels depending on the strategy selected, leading to various levels of emotional exhaustion, dissonance, and burnout (Grandey 2003).

The level of emotional labor may also vary depending on the discipline and the nature of the work (Humphrey 2021; Serebrenik 2017, Wang et al. 2019). For instance, hospitality students are often trained to perform emotional labor to provide high-quality service (Chu and Murrmann 2006; Xiong et al. 2023). They often receive training in social interactions, inter and intrapersonal, and communications skills as a part of their curriculum, as their work involves frequent interactions with customers or guests. Hence, they may know more about how to manage their tone of voice, body language, and facial expressions to convey a welcoming and professional demeanor, resulting in more emotional labor. On the other hand, engineering students have traditionally been stereotyped as working in a technical field (Lönngren et al. 2021) that does not principally depend on making clients and colleagues feel particular emotions (and consequently, may be assumed to not involve high degrees of emotional labor). They thus may receive less (almost no) formal training in similar issues in their education, as their work is more focused on technical skills and scientific problem-solving. It is worth noting that although engineers also receive training that is supposed to support their "professional development" through the development of professional skills, often called transversal skills (Kovacs et al. 2020), the development of such skills – even

though they exist – is minimal, and often dismisses the importance of emotional dimension. Thus, engineering students may be more likely to engage in emotional labor to regulate their relationships with teammates or teachers while working on team projects, which involves managing conflicts, emotions, expectations, deadlines, stress levels, and effective communication and collaboration. The emotional labor of engineering students may also be higher due to the lack of cultural bridges between home and engineering culture (Godfrey and Parker 2010), the culture of competitiveness in engineering (Hacker 1981), and the culture of hypermasculinity and the importance of displaying behaviors and values that align with hypermasculinity (Leyva et al. 2016). These factors can give rise to more emotional labor experienced by engineering students.

In short, engineering and hospitality students may differ in their experiences and engagement in emotional labor. However, it is worth noting that although many studies focus on emotional labor in hospitality, there is a lack of studies addressing emotional labor in engineering (Buzzanell et al. 2023; Houben and Wuestner 2014; Serebrenik 2017). To our knowledge, no study has focused on differences or similarities in the emotional labor of those two groups. This study thus aims to investigate to what extent the levels of emotional labor experienced in team projects differ in a sample of engineering students who are in technology-oriented roles and, therefore, may not see emotion regulation as a skill and hospitality students who are in service-oriented roles and thus may see emotion regulation as a critical skill. The research question we sought in this study was therefore as follows:

RQ. How do the levels of emotional labor experienced in team projects differ in a comparative analysis of engineering and hospitality students?

2 METHODOLOGY

2.1 Method

In this study, we administered an Emotional Labor Survey to the engineering and hospitality students involved in team projects. We used a modified version of the Emotional Labor Survey developed by Diefendorff et al. (2005). The survey includes 14 items under the three factors: Surface-acting (7 items), Deep-acting (4 items), and Naturally Feeling (3 items). Also, it included 11 demographic questions related to participants' age, gender, level of education, main fields, as well as why and how they participated in the teams, and the duration of interactions in the teams, etc. The survey employed a 5-point Likert scale. The lowest score was 1 (never), and the highest was 5 (always) for an item. Students took the survey online on a purpose-designed platform. The testing procedure usually lasted five to ten minutes.

2.2 Participants and Data Collection Procedures

Data collection started in late 2022 at two European universities (a large technical university and an international hospitality management school) and is ongoing. Ethical approval for this study was obtained from the institutional research ethics committees. Since teaching takes place in English at both universities, and since the original questionnaire was in English, we used the English-language version of the questionnaire, which was administered online. So far, 90 engineering and 174 hospitality students in team projects have participated in the study. *Table 1* shows the distribution of various demographic and other variables among two distinct student groups. Of the 264 partipants, 34.10% (N: 90) were engineering students, while 65.90% (N: 174) were hospitality students. In total, 47.35% of the respondents were

female, 34.09% belonged to the age group of 21-23, and 45.45% were in their 1st year of a Bachelor's program. In total, 38.64% of students had been a member of that team for over three months, 60.61% chose to join the team while the teams were forming, and 71.97% reported that their interactions with team members lasted more than 5 minutes during team meetings. Among the engineering students, 58.89% identified themselves as male, 40.00% as female, and 1.11% identified with a gender other than male or female. On the other hand, among the hospitality students, 45.40% identified themselves as male, 51.15% as female, and 3.45% identified with a gender other than male or female. Most students in both institutions (72.22% and 54.60%) chose their teams. An important difference between the two institutions is the duration of interaction during team meetings: Half of the engineering students (51.11%) surveyed reported that the normal interaction timeframe for them was more than 5 minutes, while this rate was 82.76% for hospitality students.

Table 1. Demographics of the participants

Variables		**Engineering Students (N:90)**		**Hospitality Students (N:174)**		**In total (N:264)**	
		N	%	N	%	N	%
Gender	Female	36	40.00	89	51.15	125	47.35
	Male	53	58.89	79	45.40	132	50.00
	Other	1	1.11	6	3.45	7	2.65
Age	18-20 years	33	36.67	88	50.57	121	45.83
	21-23 years	38	42.22	52	29.89	90	34.09
	24-+ years	19	21.11	34	19.54	53	20.08
Educational Level	1st Year Bachelor	24	26.67	96	55.17	120	45.45
	2nd and 3rd Year Bach.	29	32.22	46	26.44	75	28.41
	Post-Bach.	37	41.11	32	18.39	69	26.14
Chose Team Members	Yes	65	72.22	95	54.60	160	60.61
	No	25	27.78	79	45.40	104	39.39
Membership Duration	1 month	20	22.22	43	24.71	63	23.86
	2 months	18	20.00	17	9.77	35	13.26
	3 months	14	15.56	50	28.74	64	24.24
	4 months	5	5.56	44	25.29	49	18.56
	5-+ months	33	36.67	20	11.49	53	20.08
Duration of interactions	Less than 5 minutes	44	48.89	15	8.62	59	22.35
	More than 5 minutes	46	51.11	144	82.76	190	71.97
	No Answer	0	0	15	8.62	15	5.68

3 RESULTS

3.1 Scale Validation

In this study, we focus on how the levels of emotional labor experienced in team projects differ in a comparative analysis of engineering (technology-oriented roles) and hospitality (service-oriented roles) students. Before making any comparisons, we performed some statistical analysis for the scale since we used it in a different field and modified some words in the items (e.g., we changed the word 'customers' to 'teammates'). The Kaiser-Meyer-Olkin (KMO) test showed that our data was suited for scale validation. The parallel analysis suggested two components and the Kaisers criterion of an eigenvalue of 1 confirmed this. These each had a clear structure with high-loading weights on a single component. Consequently, we deleted the two surface-acting items and reverse-coded the three items of the 'Naturaly Feeling' factor. *Table 2* shows the factor analysis results on the remaining 12 items. The two factors identified are (i) 'deep acting' (following the lead of Chu and Murmann [2006]), who similarly found a two-factor structure for emotional labor) and (ii) 'emotive dissonance.'

Table 2. Scale Validation (N: 264)

Items**	Emotive Dissonance (8 items)***	Deep Acting (4 items)***
I fake the emotions I show when dealing with teammates	0.83	
I put on a mask in order to display the emotions I need for the team	0.78	
I show feelings to teammates that are different from what I feel inside	0.74	
The emotions I show teammates come naturally*	0.74	
The emotions I express to teammates genuine*	0.70	
I just pretend to have the emotions I need to display for my team.	0.68	
I fake a good mood when interacting with teammates	0.65	
The emotions I show teammates match what I spontaneously feel*	0.65	
I work at developing the feelings inside of me that I need to show to teammates		0.76
I work hard to feel the emotions that I need to show to teammates.		0.73
I make an effort to feel the emotions that I need to display toward other teammates		0.71
I try to experience the emotions that I must show to teammates		0.67
Cronbach's α	.87	.71
Variance explained (%)	35.93%	18.50%
Eigenvalue	4.31	2.22
Kaiser–Meyer–Olkin measure of sampling adequacy	.85	

Note: * Reverse coded. **All items derived from Diefendorff et al. (2005) *** Factor loadings less than .40 have been removed for ease of reading.

The emotive dissonance dimension had eight items with strong factorial reliability (Cronbach's alpha = .87).The deep-acting dimension contained four items with acceptable factorial reliability (Cronbach's alpha = .71). The two-factor solution accounted for 54.43% of the total variance, with the emotive dissonance dimension accounting for 35.93% and the deep-acting dimension accounting for 18.50%. All items had loadings greater than .60 and loaded well onto their corresponding dimensions. As a result, the instrument was satisfactorily modified. Then we performed data analysis for comparisons of groups.

3.2 Comparing the levels of emotional labor experienced in team projects between engineering and hospitality students

We performed descriptive statistics for each factor and group. Then, we conducted independent two-sample t-tests or ANOVA on the differences in each mean for the groups. We marked the results in tables that are significant at the p = .05 level. *Table 3* provides means and standard deviations, while *Table 4* shows the comparisons for each group.

Table 3. Means and standard deviations for each of the factors by groups

	University	N	Mean	Std. Deviation	Std. Error Mean
Emotive Dissonance	Engineering	90	2.55	.76	.08
	Hospitality	174	2.34	.77	.06
Deep Acting	Engineering	90	2.90	.78	.08
	Hospitality	174	3.04	.85	.06

As *Table 3* shows, both groups had moderate levels of emotional labor (means from 2.34 to 3.04 on a 1-5 scale). In other words, both groups had emotional labor. However, engineering students (M = 2.55, SD = .76) had a higher level of emotive dissonance than hospitality students (M = 2.34, SD = .77), while hospitality students (M = 3.04, SD = .85) had higher level of deep-acting than engineering students (M = 2.90, SD = .78). To reveal if there were statistically significant differences between the groups' means, we performed an independent samples t-test (*Table 4*).

Table 4. Independent samples t-test for each of the factors by groups

	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence	
Emotive Dissonance	.12	.74	-2.06	262	.040*	-.21	.10	.40	.01
Deep Acting	1.23	.27	1.25	262	.213	.13	.11	.078	.35

*Statistically significant difference p <. 05

Table 4 shows that there was a statistically significant difference in emotive dissonance between the engineering and hospitality students [Engineering (M = 2.55, SD = .76 and Hospitality (M = 2.34 SD = .77) groups; t (262) = -2.06, p = .040)]. However, there was no statistically significant difference in deep-acting between the engineering and hospitality students [Engineering (M = 2.90, SD = .78) and Hospitality (M = 3.04 SD = .85) groups; t (262) = 1.25, p = .213)].

3.3 Comparing the levels of emotional labor experienced in team projects between engineering and hospitality students in terms of some variables

Dividing the students into groups based on their gender identity yielded no significant difference concerning the emotive dissonance [Female (M = 2.37, SD = .74), Male (M = 2. 43, SD = .81), and Other (M = 2.70, SD = .78; (F (2, 263) = .68, p = .506)] and deep-acting [Female (M = 2.93, SD = .82), Male (M = 3.04, SD = .84), and Other (M = 3.18, SD = .70; (F (2, 263) = .70, p = .496)]. *Tables* 5a and 5b show the results.

Table 5a. Means and standard deviations for the factors by gender identity

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
Emotive Dissonance	Female	125	2.37	.74	.07	2.24	2.50
	Male	132	2.43	.81	.07	2.30	2.57
	Other	7	2.70	.78	.30	1.97	3.42
	Total	264	2.41	.78	.05	2.32	2.51
Deep Acting	Female	125	2.93	.82	.07	2.79	3.08
	Male	132	3.04	.84	.07	2.89	3.18
	Other	7	3.18	.70	.27	2.53	3.83
	Total	264	2.99	.83	.05	2.89	3.09

Table 5a. Comparisons (ANOVA) for the factors by gender identity

		Sum of Squares	df	Mean Square	F	Sig.
Emotive Dissonance	Between Groups	.82	2	.41	.68	.506
	Within Groups	157.29	261	.60		
	Total	158.12	263			
Deep Acting	Between Groups	.97	2	.49	.70	.496
	Within Groups	180.45	261	.69		
	Total	181.42	263			

In our research, an analysis of the participants' emotive dissonance and deep-acting concerning additional demographic variables yielded no significant results. In other words, dividing the students into groups based on their age, educational level, choosing team, membership duration, and duration of interactions resulted in no significant difference between the emotional labor of engineering and hospitality students.

4 CONCLUSIONS

We designed this study to reveal to what extent the levels of the emotional labor of engineering and hospitality students working on team projects differ. The question was, “How do the levels of emotional labor experienced in team projects differ in a comparative analysis of engineering and hospitality students?”

The findings of the study revealed that engineering students demonstrated similar, even higher, levels of emotional labor to those of hospitality students, indicating that contrary to common beliefs, engineering students engage in emotional labor in team projects. This is an important finding as it challenges the perception that engineering study is solely focused on abstract technical tasks and does not require emotions. However, it is worth noting that engineering students, in general, received less training that can be related to emotional labor than their hospitality counterparts. Furthermore, there is also evidence that hospitality students have higher levels of emotional intelligence than students in other disciplines (Darioly 2019). As a result, engineering students may rely on less sophisticated and more emotionally costly strategies when performing emotional labor. This might explain why engineering students exhibit higher levels of emotionally dissonant labor than hospitality students. Another possible explanation for the higher levels of emotionally dissonant labor among engineering students might be related to the timeframes of their interactions. Engineering students focus mainly on the technical aspects of the projects, which require more rapid decision-making and problem-solving while working on team projects. As it is seen in *Table 1*, of the engineering students surveyed, 51.11% reported that their normal interaction timeframe was more than 5 minutes, whereas, for hospitality students, the percentage was much higher at 82.76%. As a result, the use of emotionally dissonant regulation strategies by engineering students may be influenced by the relatively shorter timeframes of their team interactions, although further investigation is necessary to validate this assumption.

In summary, the study demonstrates that emotional labor is an essential aspect of team projects for engineering students. While they exhibit similar (even higher) levels of emotional labor compared to hospitality students, engineering students may require additional training and support to regulate their emotions in team contexts effectively. As the different emotional labor strategies have different impacts on individuals’ mental health, burnout, and performance, it was crucial to understand first to what extent engineering students (compared to other students in various disciplines) experienced emotional labor. Thus, in this study, we aimed to reveal the level of emotional labor that engineering students experienced in team projects. Given the study’s preliminary findings, educators should focus more on courses and interventions designed to enhance engineering students’ transversal or emotion management skills.

4.1 The next steps of the study

In this study, first, quantitative survey data were gathered from the two distinct populations of students to determine where there might be differences in intragroup emotional labor. Then, a second qualitative stage will be undertaken to determine potential reasons for their intrateam behavior through interviews with a smaller sample. Data collection is currently in progress. The results will provide valuable insight into emotional management, likely identity construction, and its relevance in discipline-specific intrateam interaction in under- and post-graduate engineers and hospitality students. Also, although demographics such as culture and ethnicity were not included in this study, they are important factors related to emotional labor and could be included in future work in this area.

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