

The Challenges of Online Teacher Education - Sentiment Analysis of Course Reviews

Chenyu Qi*

Dalian Maritime University, Dalian, Liaoning Province, China

Abstract: online course in higher education has gained widespread acceptance and experienced notable development in recent years, particularly in the post-pandemic era. To explore the opportunities and challenges from learners' perspectives when developing an online course, two main research questions guide the study: (1) What factors influence learners' perceptions of their learning experience as either positive or negative? (2) What dominant themes can be identified from a word frequency analysis of course reviews that indicate areas for potential improvement? In this study, 1,763 reviews related to online teaching from seven distinct courses on Coursera were analyzed by using R. Results show predominantly positive reviews (average score of 2.37), with a minor portion reflecting slightly negative sentiment (average score of -1.1). However, some learners pinpointed inconsistencies and errors within the course materials, underscoring the necessity for regular content audits and updates. This study provides valuable insights for educators and course designers aiming to enhance online education quality.

1. Introduction

Throughout the course of the pandemic, global mandates have necessitated strict social distancing measures, catalyzing a transformative shift from traditional classroom instruction to online educational platforms. Poom-Valickis et al. highlighted the substantial challenges that emergent technologies introduce to the conventional educational framework [1]. Both educators and students found themselves compelled to depend upon digital tools and e-learning platforms, confronting multifaceted challenges encompassing technological adaptation, socio-economic disparities, literacy proficiency, elevated work burdens, and platform compatibility [2].

Nonetheless, the onset of this digital transformation predates the pandemic, having been studied and discussed as a topical issue in higher education for several years prior [3,4]. In the contemporary post-pandemic landscape, the efficacy of online pedagogy remains a salient topic within the higher education community. This relevance is underscored as an increasing number of educators start to understand and accept the effectiveness of well-designed online courses with adequate strategic preparation, organizational knowledge, and proficient technical skills.

While numerous educators are proficient in conventional face-to-face pedagogies, many find themselves at an introductory level when orchestrating comprehensive online courses or blended courses. Confronted by a dearth of technological support and systematic training, these educators grapple with challenges related to fostering meaningful student

engagement, devising effective assessments, supervising learning, and achieving exemplary educational outcomes. For illustration, a survey in France revealed that 65% of educators had not received adequate training [5]. In a parallel vein, research from Egypt indicated that the predominant challenge is the lack of online teaching experience [6]. In light of these challenges, there have been various training initiatives and research endeavors pertaining to online teacher education in recent years. However, few studies focus on the teachers' perspectives who are studying the training courses of how to teach online. To fill this research gap, this study collated reviews of seven online educational courses that were gathered from Coursera—one of the biggest online platforms—to discern educators' pedagogical needs and thereby augment the caliber of online teaching quality accordingly. These reviews prompt educators to rethink the educational course design of online teaching through learners' perspectives.

Informed by the aforementioned, the present study is steered by two primary research questions:

- (1) What factors influence learners' perceptions of their learning experience as either positive or negative?
- (2) What dominant themes can be identified from a word frequency analysis of course reviews that indicate areas for potential improvement?

2. Method

In this research, R was employed for data collection, sentiment analysis, and data visualization.

qichenyu1996@gmail.com

3.2. Lexical Analysis of Positive and Negative Reviews: Which salient themes or dimensions surface from the frequency-based examination of course reviews, suggesting areas for potential enhancement?

The most two frequently occurring words in both positive and negative reviews are ‘course’ and ‘online’, with a total

frequency of 1374(course) 606(online), and 119 (course) 54 (online) respectively. Given their central thematic relevance, these two words were not added to the word frequency list. Scrutinizing the lexicon from reviews alongside their respective frequency, to further investigate the aspects of potential enhancement, the nouns with high frequency were divided into five main categories, namely community, tools, process, object, and other concepts (See Table 3).

Table 3 Word Frequency of nouns

Category	Community		Tools		Process		Content		Other concepts	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Word	teacher		tool		feedback		knowledge		time	
Frequency	47.38	45.48	32.83	37.21	5.03	14.47	23.03	20.67	19.32	22.74
Word	student		resource		activity		information		opportunity	
Frequency	30.71	41.35	32.03	28.94	13.24	12.40	23.03	16.54	7.68	8.27
Word	instructor		video		assignment		skill		education	
Frequency	22.77	16.54	27.53	39.28	19.85	26.88	17.21	6.20	10.59	14.47
Word	beginner		technology		teaching		ideas		future	
Frequency	8.21	2.07	32.83	26.88	121.77	76.49	12.18	2.07	9.79	2.07
Word	peer		link		learning		topic		world	
Frequency	11.38	24.81	12.18	35.15	79.68	26.88	8.74	16.54	7.15	6.20
Word	class		material		experience		question		covid	
Frequency	21.97	20.67	19.85	31.01	35.21	16.54	4.76	14.47	6.88	6.20
Word	university		platform		practice		errors		English	
Frequency	6.88	12.40	10.85	2.07	15.88	10.34	0.26	12.40	3.97	14.47
Word	learner		document		instruction		strategy		language	
Frequency	9.79	4.13	0.26	6.20	2.91	8.27	7.41	6.20	5.03	10.34
Word			article		discussion		example			
Frequency			1.85	10.34	6.35	6.20	7.68	8.27		

The first category ‘community’ encapsulates eight terms: teacher, student, learner, instructor, beginner, peer, class, and university. This category comprehensively represents academic communities, spanning from individual learners to entire universities. Upon course completion, learners centered their feedback around these key terms and gave them an assessment in the reviews. Illustratively, many learners, acknowledging the course's enrichment, have given the comments such as “thanks to xx universities” or “thanks to the teachers”. Additionally, certain learners provided more nuanced feedback, supplementing their comments with examples and detailed explanations. For example:

- (1) “... it shows and teaches you how to be a better *teacher* using different tools...” (Sentiment score = 2.5)
- (2) “...*teachers* explaining best ways to plan and organize classes...” (Sentiment score = 2.0)

The second category encompasses eight instrumental tools pivotal to the realm of online education and its delivery. Tools refer to instructional theory, learning materials, and online tools that assist online teaching. Brame emphasized the significance of one such educational tool, pointing out that the videos would help to maximize student engagement and promote active learning [7]. We could also find similar feedback from learners. For example:

- (1) “...The *videos* were short and engaging and the tasks were directly linked to the material that I had covered.” (Sentiment score = 2.0)
- (2) “...the *material* is very complete and interesting; I will use the knowledge I get as best as I can...” (sentiment score = 2.4)

The process of learning and teaching are pivotal components of a successful course not only in the online teaching environment, in which seven representative words that occurred in the reviews are listed. This category of reviews discussed the importance of how a successful course is designed and organized to deliver information and knowledge. The importance of engagement was emphasized in most of the processes, such as feedback, assignment, and discussion. Learners displayed an affirmative disposition towards proactive engagement, either with instructors or peers, within the online learning milieu. As Hew concluded from a case stud, problem-centric learning with clear expositions, instructor accessibility and passion, active learning, and peer interaction are important factors of a satisfying and engaging online learning experience [8]. From the learners’ perspective, the reviews have verified this conclusion. For example:

- (1) “...The peer feedback helped me realize the things I need to work on and made me open my eyes to ideas shared by colleagues in the course...” (sentiment score=2.33)
- (2) “...I prefer to get feedback from the instructors--that is why I am taking the course...” (sentiment score=1.67)

In relation to the course content, evaluations emphasize the integration of knowledge, information, skills, ideas, and strategies, all of which are indispensable elements for a proficient online curriculum. These courses predominantly incorporate documents, videos, or hyperlinks either as supplementary or principal teaching materials. Furthermore, given the pedagogical orientation

of these courses towards, online teaching, some of the tools were introduced to the learners about how to use them effectively to facilitate online teaching. The learners with negative experiences are mostly hurt by content inaccuracies. The learners of this course are usually educators who want to enhance their teaching ability in the context of technological transformation. They are much more sensitive about the accuracy of the course quality. For example, the following reviews have negative sentiment scores, indicating that errors in the information delivery process are seriously affecting their learning experience.

(1) "...Several *errors* in the quizzes which nobody bothers to correct."

(2) "...Plus, numerous spelling *errors* and wrongly formulated quiz questions make the whole experience daunting."

(3) "There were quite a bunch of links with 404. I think in the current times it would be much easier than back then when the course was created to track the error-links."

4. Conclusion

This study delved into the sentiment analysis of online course reviews, targeting specifically seven courses on Coursera. The feedback predominantly revolved around four core dimensions of online education: community, tools, process, and content of an online course. An overwhelming majority of the participants, who concurrently serve as educators leaning towards online teaching methods, held a positive outlook. Approximately 95% of the respondents expressed favorable sentiments, emphasizing the pivotal role of embracing these positive elements for curating a superior online learning experience.

While positive feedback outweighed the negatives, it's essential to acknowledge the areas earmarked for improvement. Some learners pinpointed inconsistencies and errors within the course materials, underscoring the necessity for regular content audits and updates.

These insights are invaluable, particularly for educators contemplating a transition to online teaching or those aiming to develop training modules for prospective online instructors. By understanding what constitutes an exemplary online course, educators can better meet learners' expectations and improve the overall quality of digital education.

However, like any empirical study, there are limitations to consider:

Platform-Centric Bias: The research drew insights exclusively from seven Coursera courses, potentially inducing a platform-centric perspective. This might not encompass the broader sentiments held by learners across various online platforms. Future studies should aim to diversify their sample sources, tapping into reviews from other e-learning platforms to ensure a more balanced representation.

Sentiment Lexicon Limitations: The sentiment lexicon, although effective, is not immutable. Given the dynamic nature of language and terminologies, especially within the educational sector, periodic revisions of the

lexicon are paramount. Ensuring it remains up-to-date is essential for accurate sentiment evaluations in subsequent studies.

In summary, this research illuminates the elements that resonate with learners in the online educational landscape and underscores areas for future academic inquiry.

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