eLearning in Short Bursts: Examining Professional Development Microlearning Videos

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Abstract: YouTube viewers watch over a billion hours of videos monthly and have multiple choices on professional development (PD) resources. Individuals create user-generated content (UGC) on YouTube and use different typologies of video production styles. This quantitative content analysis study examined 80 YouTube microlearning videos that provided insight into how consumers viewed the UGC using the thumbs-up/down ratings and comments. The aim was to examine the consumers' ratings and comments using the Morain & Swarts (2012) instructional design quality (IDQ) framework and the ARCS Model (Keller, 1987) to determine any relationships among these variables. This study found that higher scores in the IDQ framework and the ARCS Model showed a relationship with the thumbs up/down icon and consumers' comments. The highest production and consumption ratings were in Relevance and Satisfaction in the ARCS Model and the affective design in the IDQ framework. Consumers indicated that the talking head video typology allowed them to see the presenter in the UGC display their confidence and self-efficacy and engage with the audience as a subject matter expert. Combining a talking head with a demonstration or text overlay also resonated well. Data were collected using a codebook related to Morain & Swarts IDQ framework. The findings provided insights for technical communication instructors or anyone interested in creating relevant video content to meet the consumers' expectations for a microlearning video of four minutes or less.

Purpose

Microlearning is informal learning, which involves spending a few seconds up to about 15 minutes learning a subject matter that deals with single letters, short texts, or complex tasks (Hug, 2005). A microlearning video can be defined as a microcontent of small chunks of information focusing on a single definable idea or topic in informal learning (Hug, 2005). Microlearning has become popular in the 21st century, allowing students to break away from traditional learning systems and absorb information in small pedagogical chunks for better comprehension.

YouTube ranked the number one choice for watching videos (Google, 2020), with over five million videos uploaded every minute (YouTube, 2022). Anyone can access a YouTube video, but can the viewer learn a subject matter without becoming frustrated because it lacks instructional design elements (Morain & Swarts, 2012) or production styles (Hansch, Hillers, McConachie, Newman, Schildhauer, & Schmidt, 2015). A viewer who watches a poorly

designed video will most likely not finish watching in its entirety but will find alternatives in the same subject matter that are more suitable for their learning needs.

The purpose was to examine PD microlearning videos. This was done using two existing frameworks: the IDQ framework and the ARCS Model. These frameworks helped analyze each video's quality and content (the production), the consumer's thumbs up/down, and comments (the consumption). Five research questions guided this study. To what extent did microlearning videos exhibit the characteristics indicated by the IDQ framework? How did the consumers rate the microlearning videos? How many consumers' comments were related to the ARCS Model? How many consumers' comments were related to the IDQ framework? What was the relationship between the characteristics defined by the IDQ framework in microlearning videos to consumers' ratings and comments?

Content and Context

Of the 467 microlearning videos reviewed, 387 were disqualified because they did not meet the six requirements: a maximum length of four minutes, spoken and written in English, uploaded in the past three years, a minimum of five comments, focused on the PD topic of interviewing for a job, did not sell a product or service, and created as UGC, not a corporation. Eighty microlearning YouTube videos were chosen for this study.

Every video was viewed twice and coded among three dimensions: the Morain and Swarts IDQ assessment rubric (2012), the ARCS Model, and the consumers' thumbs up/down and comments. Each video's typology of video production styles was counted in every video to learn if the chosen style could help or hinder the pedagogical objectives (Hansch et al., 2015). The typologies of video productions were actual paper/whiteboard, animation, classroom lecture, conversation, demonstration, green screen, interview, Khan style table capture (chalk and talk), live video, on-location, picture-in-picture, presentation slides with voice-over, recorded seminar, screencast, talking head, text overlay, Udacity style tablet capture (chalk and talk), and webcam capture.

A second coder coded a random sample of videos using a Likert scale to agree on the frequency ratings. Cohen's kappa coefficient was used to determine inter-rater reliability. The inter-rater reliability score was 0.73, indicating substantial agreement.

Morain & Swarts' (2012) IDQ framework rubric consists of physical, cognitive, and affective designs. Within these three designs were three elements. The physical design elements corresponded with access, viewability, and timing. Access or accessibility was the focus area on the screen relevant to the instruction. Viewability deals with audio, video, or text quality. Timing is the pacing of the video for the end-user or viewer. The cognitive design elements were accuracy, completeness, and pertinence. Accuracy is the content presented without factual errors or execution. Completeness is the organizing superstructure that defines tasks and forecasts steps and objectives. Pertinence relates to the content of the instructional goal and instructional purpose. The affective design correlates with confidence, self-efficacy, and engagement. Confidence is the narrator's confidence, knowledge, and skills in presenting the subject matter. Self-efficacy is if the viewers complete the tasks of the focus of instruction. Engagement is the

viewers' interest and motivation. Their IDQ rubric stated the objective and goal of each design and rated them into three categories: good, average, and poor video.

Keller's (1987) ARCS (Attention, Relevance, Confidence, and Satisfaction) Model consists of four elements. Attention captures the learners' interest with active participation, humor, conflict, variety, and real-world examples. Relevance uses language, analogies, or stories that can link to the learners' previous experience, perceived present worth, perceived future usefulness, models of success, or provide choices. Confidence helps learners believe they can succeed by facilitating self-growth, communicating objectives and prerequisites, providing feedback, and giving them control over their learning process. Satisfaction is divided into intrinsic motivation (curiosity, pride, interest, praise) and extrinsic motivation (rewards, promotions, benefits, and prizes).

The IDQ framework and the ARCS Model were used to understand the consumer's responses to a single completed video using their thumb reactions and comments. In addition, the IDQ was used to analyze the characteristics indicated by the framework by using the Likert scale of a 1-5 rating. The study did not examine the videos' content, but the videos' quality was measured from the inclusion criteria for the two hypotheses. The first alternative hypothesis was as IDQ scores increase, viewer ratings and comments related to the ARCS Model and IDQ will increase. The second alternative hypothesis was as IDQ scores increase, viewer comments will be rated more positively than negatively. This study did not use content analysis to quantify and analyze the videos' meanings and relationships, words, themes, or concepts. Still, scoring was used to count the number of thumbs-up and down, the total number of thumbs, and the number of positive, neutral, and negative comments. The consumers liked or disliked the video and displayed their feelings with thumbs reactions and positive, neutral, or negative comments. Quantitative descriptive statistics, inferential statistics, and Pearson's *r* were used.

Literature Review

A current literature review has found microlearning studies in health-related topics such as clubfoot, nursing, and orthodontics. Still, they have yet to be discovered in PD microlearning videos for the public. A 2019 study on user comments, views, and dislikes was conducted on entertainment and political videos but did not address the video length, content, or motivation (Möller, Kühne, Baumgartner, & Peter, 2019). In the content marketing YouTube study, the engagement framework was used, and a codebook was developed for the four factors of this framework; interactivity, attention, emotion, and cognition, that was used on 50 brands (Wang & Chan-Olmsted, 2020). In a university classroom, YouTube videos were studied for their pedagogical benefits (Jackman, 2019), as another higher education study provided specific advantages of using YouTube videos for teacher educators and teacher trainees. One of these benefits was that teacher educators used shorter YouTube video clips, approximately five to 10 minutes, that could help teacher trainees learn the content without overload or losing their focus for longer videos that are 30 minutes long (Srinivasacharlu, 2020). Although these studies were rich in content analysis, they did not address microlearning, evaluating instructional videos, or whether the user was satisfied with the video. This research aims to address a gap in the existing literature in this underexplored area.

Findings

Using the Likert scale with one as poor and five as good ratings per video, of the 80 videos, 23 (28.75%) received the maximum score of 15 points that exhibited the characteristics indicated by the IDQ framework (physical, cognitive, and affective design). Sixty-one videos (0.76%) rated between 11-15 points. These 23 videos were rated highly because they exhibited high-quality video production from the IDQ framework in all three categories. Thirty-eight (47.5%) videos were rated 11-14 points. They rated well in the nine elements of the IDQ framework but needed to include some critical factors in the physical, cognitive, and affective designs. Seventeen (21.4%) videos received a rating between 6-10 as they conveyed some of the IDQ framework elements. These videos were more at risk for consumers to click out of before completion since they needed to execute better results in one, two, or three design elements. Two videos (2.5%) scored three points each and were placed in the 0-5 lowest rating category, indicating that a high-quality video production from the IDQ framework was not displayed. Each design category needs to improve many elements to receive a higher rating.

Consumers rated the microlearning videos with more thumbs-up than thumbs-down. Among the 80 videos reviewed, there were 113,904 thumbs-up and 6,620 thumbs-down ratings. The most significant number of thumbs-up ratings for a single video was 21,000, and the lowest number of thumbs-up ratings was zero. The largest number of thumbs-down ratings for a video was 1,903, and the lowest number of thumbs-down ratings was zero. The average (mean) number of thumbs-up ratings was 1,423 (*SD*=3067.15). The average (mean) number of thumbs-down ratings was 82.75 (*SD*=236.56).

On March 20, 2021, YouTube used its Twitter feed and tweeted that they were testing a few new designs for the thumb icon in response to creators' feedback on their well-being and dislike campaigns (YouTube, 2021). Since the data collection was completed in October 2021, YouTube's thumbs-down icon did not affect this study.

The total number of consumer comments related to the ARCS Model was counted. Each comment was viewed and placed in a positive, neutral, or negative category for Attention, Relevance, Confidence, and Satisfaction. Of the 1,537 ARCS Model comments, Relevance had a total of 522 comments with an average (mean) of 6.90 (*SD*=10.46) per video, and Satisfaction had a total of 977 comments with an average (mean) of 12.21 (*SD*=17.71) per video. The median for Relevance was three, and the mode was six. The median for Satisfaction was six, and the mode was four. The interpretation of this data demonstrated that consumers connected with the videos. The consumers felt the videos had a purpose and were content watching them.

Of the 1,537 ARCS Model total comments, 1,476 (96%) were positive, with an average (mean) of 18.45 (*SD*=25.73) per video. The total ARCS Model neutral comments were 42 (.02%), with an average (mean) of 0.53 (*SD*=0.99). The total ARCS Model negative comments were 19 (.01%), with an average (mean) of .24 (*SD*=0.78).

Of the 977 total comments in the Satisfaction category, 938 (96%) were positive comments with an average (mean) of 11.73 (*SD*=17.22) per video. Since most Satisfaction comments were positive, comments such as, "That was very professional and very helpful," or "So well done, so

clear, direct, and just the right amount of energy," demonstrated the consumers' desire to engage positively with the content creator. The total Satisfaction neutral comments were 23 (0.02%), with an average (mean) of 0.29 (*SD*=0.75). The total Satisfaction negative comments were 16 (0.01%) with an average (mean) of 0.20 (*SD*=0.72). The median and mode were aligned with the mean and displayed similar results. The higher numbers were in the positive comments (median = 5.50 and the mode = 5), while they were very low for both the neutral and negative categories (median = .00 and the mode = 0).

Of the total ARCS Model comments, Relevance had 552 comments and was the second highest category with an average (mean) of 6.90 (*SD*=10.46) comments per video. For positive comments related to Relevance, 533, the average (mean) was 6.66 (*SD*=10.22). With only 18 neutral comments and one negative comment, the data deciphered the consumers' self-selected and wrote positive feedback explaining how these videos could be useful. Comments such as "super informative and all useful information" were classified in this category. In the neutral comments related to Relevance, the average (mean) was 0.23 (*SD*=0.64). The negative Relevance comments average (mean) was 0.01 (*SD*=0.11). This data displayed that the consumer's comments on Relevance were overwhelmingly positive. Since commenting on videos is another form of engagement with UGC, consumers can self-select whether to interact.

As the ARCS Model, the IDQ framework viewed and counted the number of comments and placed them in a positive, neutral, or negative category in the physical, cognitive, and affective design. There were 1,678 IDQ consumers' comments, with an average (mean) of 20.98 (*SD*=38.69) per video related to the IDQ framework. The affective design had the most comments, with 1,670 (99%) per video. The three subcategories or subscales in affective design are confidence, self-efficacy, and engagement (Morain & Swarts, 2012). Consumers wanted to participate in commenting about the video because the content creator inspired confidence by presenting themself as knowledgeable and skilled, or the video persuaded them that they could complete the tasks that were the focus of instruction, or they were interested and motivated to want to engage. The cognitive design had the second-most comments, but there were only five. The physical design had the fewest comments per video, with three.

For positive comments in the physical design, the average (mean) was 0.04 (*SD*=0.34) per video. The average (mean) was 0.06 (*SD=0.56)* per video for the positive comments in the cognitive design. For the positive comments in the affective design, the average (mean) was 15.96 (*SD*=32.33) per video. The median and mode for the positive comments in the physical design were zero. The median and mode for the positive comments in the cognitive design were zero. The median positive comments for the affective design were 5.00, and the mode was zero. This indicated that the videos positively influenced most consumers, and they wanted to express their feelings and emotions by taking the time to write comments.

There was only one correlation between the characteristics defined by the IDQ framework in microlearning videos to the consumers' ratings and comments. For the relationship between the characteristics defined by the IDQ and the ARCS Model comments, the data revealed a statistically significant difference for Relevance with $p = .039<.05$. There was a relationship between the IDQ score and the Relevance comments. Since the majority commented positively, the consumers either understood the goal orientation, learning goals that matched their motives,

or the content had some familiarity that could relate to their personal experience. The figures suggested that when IDQ scores were rated high, positive Relevance comments were also rated high. An alternative hypothesis did occur as the IDQ framework (production) resulted in high scores, and the consumers rated their comments positively for Relevance in the ARCS Model. This hypothesis was tested and compared to the data that indicated this phenomenon to be true.

Implications for Practice

The microlearning video technique of informal learning, divided into smaller chunks of information on a single topic (Hug, 2017), can keep consumers engaged. The talking head video production typology (Hansch, et al., 2015) received the highest consumer ratings and can be attributed to the affective design in the IDQ framework. Consumers preferred that the content creator be seen in the video. The talking head typology displayed credibility when the consumers could see whom they interacted with. The consumers could see and hear if the presenter showed confidence as a subject matter expert, used self-efficacy to persuade them to complete the tasks that were the focus of instruction, and kept their interest and engagement. It is the simplest and most cost-effective video format with a single person talking into the camera. The ARCS Model and IDQ frameworks revealed not just the production quality of the UGC but also the consumers' responses. Still, they blended them to show a fuller understanding between production and consumption.

Conclusion

This study signified that if the PD topic resonated well with the consumers, the talking head video typology was used, the presenter displayed themselves as a subject matter expert, and the microlearning video had the correct balance from the physical, cognitive, and affective designs of the IDQ framework, satisfaction could be reached. With over one billion videos online on multiple platforms accessible 24/7 globally, technical communicators and UGC users can use this study as a guide in creating their PD microlearning videos or any subject matter for all consumers. While every element in the instructional design framework is essential, it is recommended that technical communicators find the right balance for the microlearning video's length, use the talking head video typology, and engage with their consumers for the best results.

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