Lab Report Analysis Comparison

Technical Writing for Engineers

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In this rhetorical essay, three different lab reports will be analyzed in terms of their similarities and differences of their sectional components. The first lab report is “A Lab-Scale Experiment Approach to the Measurement of Wall Pressure from Near-Field under Water Explosions by a Hopkinson Bar” written by Cui, Yao, and Chen. It was published by *Shock and Vibration* on September 2018. The second lab report is “Degradation of Amine Solvents in a CO2 Capture Plant at Lab-Scale: Experiments and Modeling” written by Delgado, Valentin, Bontemps, and Authier. It was published in April 2018 by *Industrial and Engineering Chemistry Research*. The third scientific journal is “Colour Association with Music Is Mediated by Emotion: Evidence from an Experiment Using a CIE Lab Interface and Interviews” written by Lindborg and Friberg. It was published in December 2015 by *PLOS One*. The following aforementioned lab reports will be analyzed and compared to see how well each of the articles were written. All three articles clearly stated the reason for the need to perform their experiments; however, *Degradation of Amine Solvents* (2018) was too technical and hard to follow for anyone who does not have an expertise in chemistry; *Lab-Scale Experiment* (2018) and *Colour Association with Music* (2015) were well written and easy to follow in terms of their simplified language. *Lab-Scale Experiment* (2018) and *Degradation of Amine Solvents* (2018) provided good graphs and mathematical equations to prove their points of the results the researchers have found. In conclusion, *Lab-Scale Experiment* (2018) was the easiest to replicate of all the three because of its simplicity of language, clear visuals, and conciseness; *Degradation of Amine Solvents* (2018) was too technical, and *Colour Association with Music* (2015) was too long in terms of its length and, as a result, could have been edited.

In the abstract section of the three lab reports, all of them did a good job in presenting the reason of why the lab experiments were conducted. In the abstract of *Lab-Scale Experiment* (2018), it was stated clearly that this experiment was conducted, because explosions underwater create enormous pressure such that it negatively affects the integrity of a vessel’s structure (Cui et al., 2018, p. 1). The experiment examined the shock wave produced along with a large air bubble that causes great stress. The stresses pressed on an underwater surface were measured by using transducers in previous experiments. In this case, a Hopkinson bar was used where one of its ends was a sensor that measured stress. The Hopkinson bar was never defined and only a rough schematic drawing of the device was shown. Even though this term was never defined, I got a clear sense for the need of the experiment and had a good idea of what the experiment was about. The importance of measuring stress underwater is vital to safety, and the abstract explains this well (Cui et al., 2018, p. 1).

In the abstract section of *Degradation of Amine Solvents* (2018), it was stated that carbon dioxide (CO2) concentrations in the atmosphere have risen significantly over the last one hundred years (Delgado et al., 2018, p. 6057). One way to reduce this emission is the postcombustion absorption through amine-based solvents. Because solvent degradation is very critical in this process, a lab pilot plant was set up to perform degradation experiments during absorption with three different types of amine solvents. Data collected from the experiment was used to assess the “performance of CO2 absorption over time and experimental conditions. The variation of CO2 fraction at the gas outlet of the reactor has been used as an indicator of solvent degradation” (Delgado et al., 2018, p. 6057). A computer model was also used to accurately predict the absorption and stripping phases. Viscosity seems to be most important parameter for CO2 absorption efficiency (Delgado et al., 2018, p. 6057). From the reading the abstract, I had a good idea on why the experiment was conducted, because of the rise in CO2 emissions. The writers did a good job in explaining on what experimental methodology was used as well as reporting the outcome they had found (Delgado et al., 2018, p. 6057).

In the abstract section of *Colour Association with Music* (2015), a lab experiment was conducted to find the crossmodal association between music and color (Lindborg et al., 2015, p. 1). Through a computer interface, a person listens to music and chooses a color that the person believes that a section of music is associated with. A correlation is then discovered between the color and emotion that the person is expressing when listening to music. According to the abstract, “Crossmodal associations may arise at neurological, perceptual, cognitive, or emotional levels of brain processing” (Lindborg et al., 2015, p. 1). It was found in the data analysis that “happy music was associated with yellow, music expressing anger with large red colour patches, and sad music with smaller patches towards dark blue” (Lindborg et al., 2015, p. 1). From the study, there is “strong evidence that emotion can mediate cross modal association between music and visual colour” (Lindborg et al., 2015, p. 1). This lab report did a good job of providing a hook for the readers. The language was not too technical, and the experiments dealt with a subject that is very relevant. All three lab reports have clearly expressed the purpose of the experiment and the outcome should be of great interest to anyone who follows science.

In the experimental work section, *Lab-Scale Experiment* (2018) was the easiest of the lab reports to follow, because it was written in a simple manner. The description of the experiment was explained well, where a water tank with a dimension 600 mm × 600 mm × 600 mm was used (Cui et al., 2018, p. 3). Then a high speed camera was used to capture time rate results of the event, where a minicharge of powder of fire cracker was exploded. The composition of the firecracker was clearly described. Later, it was written that a small electric charge was then used to set off the powder where the diameter of the explosion is less than 2mm (Cui et al., 2018, p. 3). The article was written clearly with precise details. However, in *Degradation of Amine Solvents* (2018), the description of the experimental work section had dry language and was uninteresting to follow. Even though the length of that section were about the same, I was less engaged because the article had more technical terms that I was not familiar with. In *Colour Association with Music* (2015), I was able to follow the description of the experimental work, but I thought it would have been more helpful if there were diagram of the apparatus; *Lab-Scale Experiment* (2018) showed a diagram of the lab experiment being conducted. Thus *Lab-Scale Experiment* (2018) article was the easiest to follow in the experiment section, because it was written clearly and simple. In addition, it included a diagram to help readers visualize the setup.

In the results section, all three lab reports did a good job of showing the data from their experiments in the form of charts and graphs. *Lab-Scale Experiment* (2018) showed several graphs where the results were displayed in the form of pressure versus time for several trials, in which the spikes in the graph were highlighted; these spikes were the detonation and subsequent air bubbles that had occurred (Cui et al., 2018, p. 9). *Degradation of Amine Solvents* (2018) showed several graphs in which relative absorption efficiency was plotted in respect to density, surface tension, and dynamic viscosity (Delgado et al., 2018, p. 6064). *Colour Association with Music* (2015) showed a graph that associated different level of emotions in correspondence to the different tones of music (Lindborg et al., 2018, p. 12). Even though I found *Colour Association with Music* (2015) to have the most interesting graphs and pictures, I found *Lab-Scale Experiment* (2018) to have the best results section because the writing was much clearer and simpler to follow. It was not tedious to read and straight to the point.

In the conclusion section, all three lab reports presented their findings and tried to summarize the lab reports; *Degradation of Amine Solvents* (2018) did the best job of summarizing, because it was straight to the point. *Lab-Scale Experiment (2018)* article almost repeated what was written in the abstract and did a good job of summarizing. However, the experiment’s goal was to find whether the Hopkinson bar can read pressure as well as a transducer. *Lab-Scale Experiment* (2018) did not really state that the bar was an acceptable device for measurement. In contrast, the conclusion of *Degradation of Amine Solvents* (2018) presented was more concise and straight to the point. It summarized the goal and the findings of the experiment in two short paragraphs. The reader had a good sense of the goal that was being accomplished. *Colour Association with Music* (2015) article presented insightful analysis of the experiment; however, the conclusion was very long, and it could have been compressed.

In conclusion, I had found *Lab-Scale Experiment (2018)* to be the best written article; the other lab reports had faults such that *Degradation of Amine Solvents* (2018) was too technical, and *Colour Association with Music* (2015) article was too long-winded to be easily read. Although *Degradation of Amine Solvents* (2018) and *Colour Association with Music* (2015) were hard to read, they provided a good reason on why their experiments were conducted. In addition, they showed good graphs and data to back up their results. The conclusions in all three lab reports were well summarized. However, I found reading *Degradation of Amine Solvents* (2018) and *Colour Association with Music* (2015) to be too tedious and that was the reason why I chose *Lab-Scale Experiment* (2018) article as the best lab report out of all the three.

References

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