

The Impact of Creativity on Alpha Activity: Description & Explanation of the Research Process

When I first began my senior thesis last fall, I felt rather lost. The paper involved developing a research topic, finding articles related to this topic, finding commonalities and differences between the articles, writing an extensive literature review, and developing an experimental study design. It was the largest and most ambitious project I had ever attempted, so I was naturally intimidated by it at first. However, with the extraordinary help of ECU's library resources, I was able to complete a research proposal I can be proud of.

This proposal, "The Impact of Creativity on Alpha Activity", examines how creative tasks can influence brainwave frequencies. The frequencies commonly exhibited by awake participants are alpha waves and beta waves. Alpha waves indicate a more relaxed state, while beta waves represent a more intense focus. Since previous studies have indicated that creativity can have a relaxing effect on mood, I suspect that this will be reflected in the brain as increased alpha activity. Many steps were taken before I could reach this conclusion.

My first step was developing my topic. I enjoy creative writing and learning about the brain, so I decided to research how creativity affects brain activity. I knew I wanted to examine brainwaves, since I have access to the technology used to observe them, but there was several different ways to analyze brainwave information. For example, you can look at the timing, the location, or the frequency of brainwaves. To determine which aspect to research, I turned to previous literature.

I used the ECU libraries EBSCOhost search function to find these initial articles. I selected to search all databases so that I would not miss out on any relevant research. This is

particularly useful for my research topic because creativity is look at in many different disciplines, such as education and business. In addition, brain activity studies can be found in not only PSYCHinfo, the database used for psychology articles, but also in more medical-based journals such as MEDLINE. I used the search terms “creativity” and “electroencephalography.” Electroencephalography is the technology used to examine brainwave activity. I looked at the first few pages of search results to find out what brainwave aspect had been examined in creativity research. I decided to focus my topic on frequency because there was previous empirical research suggesting a relationship may exist between creativity and brainwave frequency.

Around the time I was developing my topic, a representative from ECU libraries gave a presentation to my senior thesis class. This presentation explained helpful tips for using ECU libraries. I used this new knowledge to find more articles about my topic. One thing I learned was that you can put an asterisk after a prefix to search for all words that begin with that prefix. This was helpful to me because brainwave technology is sometimes referred to as electroencephalogram instead of electroencephalography. By using the search term “electro*” instead of “electroencephalography”, I was able to find articles that referred to the technology with either term. Another useful thing I learned from the presentation is to search for similar terms with the word “or” in between. This helps to include articles that refer to the topic of interest in slightly different ways. I decided to change my search term from “creativity” to “creativity or creative or creative thinking”. This was a successful way to increase the number of articles that were being found.

In addition to having a large quantity of possible articles, I had to have high-quality articles. To help with this, I decided to filter my results by the source type “Academic

Journals”. I also filtered my search according to publication date, changing the first date to “2000”, to make sure the articles were relatively recent. I then looked through the articles one by one and saved permanent links to ones that seemed useful.

I then had to find commonalities and differences between the articles. To do this, I wrote brief article summaries for the most relevant articles. I included information such as the study’s hypothesis, design, variables, results, and implications. This gave me a good understanding of the past literature on creativity and brainwave frequency. I learned that most studies found that creativity was associated with alpha frequency, but some found it was associated with beta frequency instead of alpha. These conflicting results piqued my interest. I had assumed that creativity would induce alpha activity because creativity was known to have a relaxing effect, so the fact that some studies had found more beta activity surprised me.

I decided to check empirical research to make sure that creativity induced the positive mood effects that I believed it did. I checked this by looking at articles collected using the search terms “creativity or creative thinking” and “mood”. I decided to use “mood” instead of “relaxation” because I didn’t want to restrict my results to only what I expected. If creativity had effects other than relaxation, I wanted to know those as well. I discovered that not only did creativity induce a relaxing state for most people, but it had long-lasting positive effects on well-being and productivity.

Since creativity did have a relaxing effect, I was confused as to why some studies found more beta activity than alpha activity. However, by examining the differences in the designs of these studies, I determined that the likely reason for this was the differing types of creativity being examined. To test this theory, I designed a within-subjects experiment that compared brainwave frequency of participants completing different types of creative tasks.

While I started the semester feeling lost, I ended it with a sense of confidence. I not only wrote an extensive research proposal, but also developed valuable skills needed to be a researcher. I learned how to create a research topic, find relevant articles, examine similarities and differences between articles, write an extensive literature review, and design a study to fill in the gaps in past literature.