



AMERICAN COLLEGE  
of  
EDUCATION®

## DL5803 Design of Instructional Media

### *Scripting for Course Modules*

#### **Module 1 – Educational Research Fundamentals and Ethics**

#### **Part 1 – Course Introduction, Definition of Research, and Different Types of Observations**

Measuring the effectiveness of learning can be a daunting task. There are dozens upon dozens of ways that this crucial piece of instructional design can be achieved. The purpose of the course is to familiarize oneself with a number of the methods that can be used to compile, receive, and disseminate data from a course. To get to that though, one must first get a strong understanding of the fundamentals of research as well as ethical concerns that may potentially occur. From there, a number of qualitative, quantitative, and mixed method options will be introduced that can be used in the measurement of items used in instructional design. Upon grasping this knowledge, this will lead one to applying them and reviewing results gathered from the measurements.

The purpose of this course is to assist you in being able to come up with compelling and applicable research projects for academia and professionally. As one can see, the applicable focus outside of research is instructional design (ID). One should remember that this type of research is critically important to the overall realm of learning because of its growing popularity and application in many industries.

The focus of the course includes the following five (5) key items. First, it is important to understand the core concepts of research which leads to applying them in a number of different ways. Next, knowing the best practices to use research studies compiled is just as important. An important emphasis on ethical behaviors is covered in the course. Second to last, a review of data received in studies and its evaluation of it brings everything learned to the fore. Finally, research's application to instructional design completes the course presented here. The overall goal after all said and done is to execute better research studies in instructional design (ID).

So, you've thought of a topic that you would like to get more information on. But you may not be sure as to how to produce it into something valuable that you can share of others. Never fear, the definition of research is here. In general, the concept of research is a way to gather information through the use of methods that are physical and nonphysical in nature. One commonly uses their senses and data in order to draw some type of conclusion.

Educational research, on the other hand, is a more specific subset of research in general. Here, there is a heightened focus on the aspects of learning and how instructional materials are designed. Regardless it is in a professional setting for a workplace or a classroom setting, educational research has no boundaries. There are a number of ways to measure it and commonly applies the use of ADDIE – a core concept in instructional design.

Primary research is one of the most common methods that can be applied to educational research. The reasoning behind it is that most learning that is done online is solitary. With the exception of most group projects or collaborations, this is often the most often used to create courses for. Specific to this, the goal is to apply the L.C.A. Method. In other words, primary research's goal is to have students learn, confirm, and affirm.

The most applicable way to do is to employ the use of the scientific method. Using this method applies to primary research for two (2) reasons. First, primary research is commonly people-based research since most learning studies are applicable to the way people learn, interact, react, and perform tasks. The other reason is that the research pool of instructional design, as mentioned by Driscoll, is commonly focused in this area.

Having the concept of research down, it is now time to go a bit deeper in the subject. There are two (2) common realms of thought that was discovered by a pair of readings assigned for this part of the course. Both the Alzheimer association of Europe and Cohen provided evidence that positivism and social constructivism are those realms in educational research.

In short, positivism is the thought where researchers attempt to seek the absolute truth and will go to extreme lengths to find it. Commonly, it is impossible to find because it is in a constant state of flux. This is due to the cause and effect relationship they analyze. Or better put, actions lead to specific reactions.

Social constructivism is a bit different but just as important. Their paradigm focus is strictly on the comprehension of the existing world we live in. More focused on facts and subjectivity, they apply knowledge from a time ago to form newer opinions and trains of thought for the present and future. Although, this is different than the other paradigm listed, they are both equally important in the way research is shaped.

Getting to the nitty gritty of the course, there are commonly three (3) common methods of research that are executed. Each of the three (3) listed will be provided ample explanation throughout the course provided. In short, they are the following:

- Qualitative research – which is focused on people, places, and things
- Quantitative research – which is focused on numbers, trends, and patterns of analytical data, and
- Mixed Methods research – which is a combination of both.

Although they are significantly important, there are some common assumptions that are made with respect to educational research methods. First, only one can be used at a time. This is definitely not the case and created the birth of mixed method studies. Secondly, they are complex and difficult to execute. Depending on the topic, this may or may not be the case. Finally, the amount of time needed for a study is another factor which goes into the determination of what to use. This is affirmed by the article Castellan wrote in 2010.

Armed with a brief overview of what types of research there are, the next thing that one needs to understand is the use of observations. **Regardless of the method used**, observations of some type must be done in order to get any data from participants. There are two (2) common types of observations that are used in research – participant and unobtrusive which Driscoll provided in his reading.

Participant observations are ones which the researcher is part of the sample population. They 'blend-in' to the sample population which is done intentionally in order to get an enhanced knowledge of what the group is like. This is important to execute when analyzing learning styles for a group and attempting to come up with ways make it more effective. Unobtrusive observations are ones which the researcher is in the shadows so to speak. In other words, they are there in some capacity but view from a distance. Depending on the research study, both could be used in order to come to a specific conclusion.

One last topic that will be talked about in this presentation has to do with bias. Bias is an opinion which can soften, adjust, or nullify conclusions that were provided via a research study. It is very important to exercise great care with this because it can reduce the effectiveness of results received from participants.

There are a number of ways that this can be reduced (although not eliminated). Having a double-entry notebook like a steno pad, use of direct inquiries, and being honest with participants are a start. Provided that you have the permission to measure participants, bias will less likely occur.

## Part 2 – Differences between Scientific Method & Process and Relation to Educational Research

Although the scientific method and process are similar in nature, there are key differences that must be understood in order to apply them to educational research. In this part of the first module, emphasis is placed on the differences between the scientific method and process and how they relate to educational research and instructional design.

Though a number of students feel that they are similar, the scientific method and scientific process applicable to research are **different** from each other. Although they are commonly similar to each other, there are some crucial differences between themselves. Let's start by giving each equal airtime by defining them prior to showing how they are different.

According to authors Michael and Cohen, the scientific method is by far the most common method to use for research studies. Regardless it is for educational research or other subject matter, it is one that has the most respect and application in research. As far as how many steps are included – that's where there's a variance of opinion. It can have as few as four (4) steps or as many as eight (8) steps.

Regardless of the number of steps, the purpose of the scientific method is quite plain and easy to understand. First, it is a systematic way to prove or disprove a theory or assumption. Secondly and most importantly, it is critical to the effectiveness and application of educational research for educational design.

In order to accommodate the highest quantities of thought with respect of how many steps are in the scientific method, it is best to use a modified approach of six (6) steps. Coming from research, personal experience of the course guide, and general thought, here is what a scientific method *should* be made of:

- Step 1: Initial Research Study on Topic
- Step 2: Hypothesis Testing
- Step 3: Tools Used To Defend/Defeat Hypothesis
- Step 4: Discussion on Data Acquired / Analyzed
- Step 5: Review of Results & Generalizations
- Step 6: Recommendations for Future Research

The guts of the course revolves around these six (6) steps with sufficient detail provided to each as a way to help understand the rationale of these.

As seen from the previous slide, there are six (6) steps for the scientific method. But why six (6) and not, seven (7), eight (8), forty-two (42), or over 9000?!! Realistically, there is proper rationale to the number of steps provided. Mentioned before, this is based on extensive practices that have been common for more than 30+ years. Also, logical thinking would combine some steps while expanding others that may not have received enough attention or applicability to as study. Strictly related to research, the six (6) step method adds emphasis for conducting research and applying it to further the pool of educational research or instructional design knowledge. One thing is for sure – it is cyclical in nature even though there is a natural beginning and end.

Giving the scientific method a rest for a moment, let's now turn our attention to a scientific process. This is a bit different because the concept in question here uses a standardized process to gain knowledge in a

specific subject or topic. While it is surely similar to the scientific method because of its structure and use of existing theories and correlations to defend or defeat theories, it is a far more structured process. Also, predictability of results are more common here.

Conclusively on the topic of the scientific method or process, a choice has to be made as to which one is the *preferred method* to use. While the scientific process is less used in educational research, its structure combined with the process of the scientific method provides a solid structure for studies. Some reasons for the justification of this include the following as seen on the slide:

- Application of revised scientific method provided.
- Use of structure is **very important** in educational research AND instructional design.

Realistically, there are a number of challenges that need to be addressed with educational research and instructional design. This includes four (4) key areas that are receiving extra attention and awareness in research studies and analyses, including...

- Disorganized courses and learning outcomes – ability to create additional learning structures for students and teachers to apply & use
- Course materials used or not used. – including the diversification of items used and how they are applied
- Incorporation of ADDIE method – a foundational theory of instructional design that deserves more attention than it receives, and
- Learning is a science in itself (and a quickly growing one!)

While it can be used in educational research, it is rare and more often the exception and not the rule.

### **Part 3 – Ethical Issues in Educational Research Studies**

Having awareness of research fundamentals are important to the application of the topic of ethics. This and the final part of the first module focus on ethics and their importance in educational research. Focusing on this portion, a definition of ethics is first introduced. Ethical norms are also provided as well as institutional guidelines that have been developed over the years that can apply to educational research are provided as a conclusion here.

So, before looking at the contents of the slide, what is a definition of ethics in your mind? Does it have to do with behaviors of yourself and/or others? How complex does it have to be and can it be learned or received? Realistically, ethics is commonly confused with integrity and honesty by definition. Instead, it applies some of the concepts but not all of them. In fact, that ethics have a number of different traits, including the following...

- It is most commonly noted for determining behaviors which are acceptable and not acceptable (norms).
- Unusually so, it is traditionally stronger in childhood but wane as one matures.
- Commonly viewed as structured standards of conduct, and
- Very important to educational research and instructional design.

Knowing the definition of ethics is one thing – behaving ethically is surely another. Although there are a lot of arguments for and against ethical behavior, there are five (5) common reasons to behave ethically. As seen on the slide, here are the highlights that are critically applicable to living an ethical lifestyle as a researcher:

- Barring extreme exceptions, it is commonly regarded as required behaviors to perform and execute a research study in any discipline.
- It promotes the pursuit of knowledge in a truthful and engaging manner.
- Acceptance of errors and omissions are plausible which are respected when admitted which shows integrity and honesty in research conducted.
- As with more things that are done with a historical point of view, research studies tend to be foundation for future works and studies proving/disproving results, and
- There are social responsibilities that must be carried out in order to protect all concerned with a project.

Ethical behavior is a way of life and not a cliché or fad that goes in and out of style.

So far, we have discussed the in's and out's of ethics. It is only right to move on and provide some background as to when things don't quite go as planned and researchers commit acts of negligence in order to complete a study in his or her favor. Here, three (3) common things seen in research done by Resnik stand out in the crowd. Fortunately enough, these are far less common than one can assume.

The first situation is the 'Bad Apple Theory.' Here, researchers are desperate for something in their study. Whether it is cash, prizes, fabulous gifts, power, recognition, fame, or some psychological need, they feel they can roll the dice and get away with it indefinitely. However, with this sour subject, they will get caught eventually (even after they pass). Although tricky to happen but more possible due to the globalization of learning and the workplace, conflicts of interests can happen. They can be competitive or personal in nature which can give one the upper hand on funding, recognition, or prime space at a convention. The tug of war between personal and professional gains are usually seen here as the biggest struggle. The third subject is a lack of awareness. Since we are all human, it is possible that this can happen. Without proper training from leadership, though, it is more likely to happen than not occur once in a blue moon or at all.

Switching gears, let's look at some institutional guidelines which can apply to ethics and educational research. David Resnik is considered by some as one of the leading experts on ethical principal development in the last 20 years or so. The article required to be read provides students with a number of different ways that his ethical principles can apply to educational research. As seen on the screen, there are numerous ways that one can behave ethically. While plentiful in numbers, it cannot be stressed enough that these are all equally important to execute in a research study with no exceptions or deviations.

A second one, which is the most frequently used in an academic setting, are principles that were developed by the *American Psychological Association's (APA)*. Deborah Smith (2003) provides five (5) main principles for research ethics as shown on the screen for one to review:

1. Converse about publishing rights and credits prior to a research project taking off.
2. Awareness of multiple roles in a research study.
3. Follow pre-established informed-consent rules for studies.
4. Respect confidentiality and participation of persons in one's research study.
5. Enrich oneself in ethical resources.

Similar to the point made with Dr. David Resnik's principles, these are just as important to follow even though there are some overlaps between them.

The final institutional measure that should be looked at has to do with the *Federal Educational Rights and Privacy Act (FERPA)* of 1974. If research studies are going to focus on students that are in an academic setting, these guidelines should be reviewed in some length in order to understand the importance of protecting student data. The three (3) points provided here are fairly straightforward.

#### Part 4 – Prevention of Ethical Issues & Examples of Wrongdoing

Part Three (3) of the first module went into detail on the concept of ethics and how one could potentially behave in an improper manner. This last part of the module takes it a bit further. Armed with an understanding of ethics, we now take a look at ways to prevent issues from coming up as well as some examples of studies going wrong. It can't be stressed enough that one must behave properly before, during, and after a research study. Also, an additional round of unethical behavior examples and its application to educational research and instructional design will be emphasized here.

Though mentioned before, it is good to take a second glance at this as it is important in every aspect of research and design. While the information provided in the bullet points is common sense for the most part, the last two (2) may be a bit confusing to some. The concept of foundational research is still present in educational research and instructional design. Hence, there is still an attempt to achieve means to an end. Also, one's moral compass must be set to a direction to behave properly and treat others with respect and integrity.

Other tips that can be used for effective studies when ethics is the main focus include the following: use of document trails – whether virtual, physical, or both; review of laws applicable to a study, ADA compliance, and so on.

When it comes to unethical examples of behavior, there are more examples than one can stuff change in a *Coca-Cola*® bottle. Provided on the slide one can see here are two (2) more common examples which may not be noticeable early on but in time are exposed and dealt with. Intentionally publishing data which favors one result over another and ignoring requests to keep data in-house are ones that can fetch severe consequences or penalties if caught.

Assuming the worst case scenario came true and one committed unethical behavior, what are some consequences they would face? Although the chance of unethical behavior occurring is very low, there are some dire consequences that could result – including...

- Disciplinary action up to termination of one's employment (in industry and academia).
- Restrictions in place barring one from conducting research in a specific field or industry for some period of time.
- Civil, criminal, and potentially severe financial penalties.
- Risk of effectiveness of educational and/or instructional design research due to intentional errors committed.

While the penalties and consequences can be quite harsh, shown on the slide here are things one can put on their checklist to ensure they are behaving proper and not committing any unethical behaviors. To be brief, short, and sweet to the point, when in doubt, ask!

Conclusively, how does ethical behavior apply to instructional design (ID)? Since instructional designers have access to many pieces of data – both private and public, there is an increased level of security required to properly conduct a research study. Provided are some general tie-ins that one could build on and expand. The hottest topics which can stir the ethics pot a bit so to speak applies to virtual studies, their effectiveness, learner accommodations, and proving research conduct was ethically proper.

With this, this concludes the first module of the course on educational research fundamentals and methods.

## Module 2 – Qualitative Research Methods

### Part 1 – Most Common Methods of Research Used By Instructional Designers

Expanding on the first module, there are a number of methods that researchers can use to get data needed to create effective instructional products. The purpose of this module is to provide a glossy overview of quantitative and mixed method research options that researchers can use in their studies as a starting point. However, the star of the show here is qualitative research. Details that are provided here as well as the next couple of modules are important to grasp in order to effectively create and execute research studies and thus, focus and attention are encouraged.

In a nutshell, here are the three (3) types of research methods that are commonly used in research as a whole. The star of the first act respectively is qualitative research. Briefly put without going into further detail, it is the best way to review, describe, and observe the physical world we live in. Population samples or whole populations that are small are commonly the most effective for a method like this. Quantitative research methods, on the other hand, use numerical and statistical data to gather data from larger populations in general. Mixed method research designs combine the both. In a moment, we'll go into a bit more depth of these prior to a comprehensive explanation.

Author Castellon provides readers and students alike a comprehensive comparison grid between quantitative (left) and qualitative research methods (right). This chart is good to analyze when deciding which type of method to execute for a research study. The focus for this module is on the right column and select elements of this chart will be given their space in time as required. This chart, though, should be reviewed as it may also apply quizzes and exams that make up this course.

Turning our focus to qualitative research, what is it in a summarized *Cliff Notes* point of view? Realistically, qualitative research is way to conduct research in-depth. The use of physical and non-physical observations where the use of eyes, ears, smell, touch, and feeling are almost guaranteed when applicable. This research method is also the most optimal to challenge interpretations or assumptions made in theories. Gathering data in order to defend or disprove conclusions can be done in a number of ways tailored to the research topic at hand.

Not to cause confusion with the ordering of this portion of the module, but quantitative research methods is the second most popular method that is commonly used. Hence, giving it some extra time on the podium is worth the sacrifice. One should note that this research method type is traditionally numerically and statistically based. Hypothesis and predictions of whether something will or will not happen comprises of a backbone of this method. While extremely structured and systematic, it is commonly prone to bias and/or errors in judgement.

The final method that scrambles both qualitative and quantitative research into a research omelet is a mixed methods research project. Here, elements of both qualitative and quantitative research are brought together to execute a research study. Contrary to popular belief, it is quite effective for a few reasons, including the following:

- Research study requires data from both research options in order to obtain a richer data set.
- It is most optimal for deeper and comprehensive research studies, and
- Use of this method may be the only way necessary to incorporate methods from both options in order to prove/disprove a hypothesis or theory.

So far, there has been a brief explanation of the three (3) methods. Since we know the 'what,' let's focus on the 'why' for a moment. Here, the use of one or more methods is necessary for most studies unless it is a very specific topic or purpose. For the sake of arguments, here are a few reasons why it is important to

use one or more methods. The one that sticks out the most is the fact that one research method may not be enough to accommodate the study in question. Other items shown are still just as important. Regardless, they are **all important** to educational research and instructional design.

## Part 2 – Qualitative Research Fundamentals

Qualitative research methods are ones which are usually passed upon because of the amount of work that is involved. This part of Module #2 includes the following:

- Definition of the research method in question
- Advantages and disadvantages of qualitative research
- Optimal uses for qualitative research, and
- A brief overview of validity and reliability that can be applied to research studies.

One should remember that this method is one which is critically important to the betterment of the pool of educational research and instructional design. Hence, this is a good place to start.

As mentioned briefly before, the concept of qualitative research is for one to have an ability to physically measure the world we live in so that the body of knowledge is expanded. This can apply three (3) core purposes that align with the purpose of qualitative research. As a start, one can measure the world through physical interactions are important to predict feelings, moods, or potential reactions to actions taken. The measurements can go a step further because these are commonly interactions between people, places, things, and scenarios. Finally, qualitative research commonly uses controlled and uncontrolled environments to get the needed research from. Basically, the world is the environment studies are done in.

As noted in research provided by Weinclaw, there are three (3) main paradigms of qualitative research. Each of these on the slide will be expanded on next.

Field observations is the first common type of research that is done for qualitative research studies. This is a method which collects data either in a real-world environment or in a controlled location/facility. Depending on what is attempting to be analyzed, it may be a combination of either real-world or a controlled environment. The use of participatory and non-participatory observations are commonly used and in the majority of field observations, data is collected from some distance. Circoki and Weinclaw in their readings provide sufficient evidence to support these facts.

When looking at field observations and how it applies to instructional design and educational research, it is important to note that the visual cues and measurements are the most common to be measured. The reason being is that it is the best method of data to gather thoughts actions, and reactions to a specific situation or set of situations. Also, the design of a course can determine the participation rates and if need be, can be recorded for future use.

Survey research is the next method that is a common staple in qualitative research. Cirocki and Marshall provide evidence of this because the use of interviews is the most applicable use of survey research. Whether they are done with just one person or multiple subjects at one time, it is one of the most flexible options of qualitative research. Best practices of this method include the use of checklists to keep things on track. Smaller populations commonly less than 25 participants is optimal for this method.

Where some intrigue comes into play is how survey research applies to educational research and instructional design. Interestingly enough, the determination of patterns of learning and/or issues with content are the primary conclusions that come from the use of survey research. This may include materials that are produced – online and offline and assignments that students are required to complete in order to

get a grade. Responses from interviews and surveys' open-ended questions can provide additional material to determine the effectiveness of instructional products.

Secondary analyses are far different than the first two (2) methods shown because this one is more of a individualized or team-based activity. The main focus here is more strictly on the literature that is already out there and analyzing strengths and weaknesses of it. For studies that need to see patterns over a longer time horizon, this is where it is the most effective. A literature view of some depth level is almost required in order to enhance the validity of a research project.

Although secondary analyses are more specific to the academic arena, there are some notable applications to educational research and instructional design. First, it provides an opportunity to show that the amount of literature on instructional design is fairly weak. Next, the use of past learning patterns to shape more effective future ways to learn (online and offline) is another advantage to use this method. Finally, it can help explain how specific methods provided in literature can be effective or ineffective for a specific learning type or group.

As seen on this slide, there are specific advantages and disadvantages of each method explained. Please take a moment and review these before going on to the next part of the lecture.

Moving to a higher gear per se, the last thing to review in this part of the module on qualitative research is the concept of validity and reliability. Validity is the measurement of the strength of conclusions, inferences, or propositions made in a study. Most commonly introduced here, this is the measurement of the strength of conclusions, inferences, or propositions made in a study. There are commonly two (2) types of validity and as seen, the main difference is whether changes will make a difference or if there are generalizations when there should be specifics for participants. Although each have their own threats, it's fair to say they are both equally prone to those possibilities.

Reliability is the other piece of the pie to close out this part. However, there can be some confusion as to how it is different from validity. The most important difference is the accuracy and consistency of results provided. Confidence levels and sampling errors are opposite of each other and are commonly used to determine the potential success or defeat of an outcome. As one can see, there are three (3) reliability types with the pretest/posttest option being the most often used with the others bringing up the rear.

### **Part 3 – Commonly Used Qualitative Research Methods**

The third part of the module on qualitative research now turns off onto a road of commonly used qualitative research methods. Qualitative research studies are not terribly difficult to create a construct as authors provided in this module's reading. Here, the goal is to provide a framework for a qualitative research study and offer suggestions for research studies applicable to instructional design (ID) using this method.

When trying to create a quality qualitative research project report, extensive research dug up a solid method that is based on concepts that Marshall and Rossman (1999) created for systematic research papers. The items that are shown for the proposal contents and potentially for a research study are fairly straightforward to execute.

Digging into a bit deeper into the process a bit, the introduction and proposal contents is often the most important part of the study. If this is incorrect in any way, the whole research project and materials in it are suspect and potentially erroneous. Seen here, there are a number of small but integrated working pieces that are important to get a qualitative research project off to a good start. The concept of piggybacking is critically important in **any** research project because there has to be order in the research chaos that has a potential to erupt.

Of all the things in a qualitative research project, the literature review is one of the most overlooked pieces and yet one of the most important. Extra care should be taken in order for a project or research report to be super effective. Some of the things that should be included in this section are traditions and patterns that literature show over time; data gathered from essays written by influential persons applicable to topic/area researching and if need be, additional research opportunities that are in similar areas of cross-purpose another.

The design and methodology sections of a qualitative research report is likely to be the second most important subject of the research project's paper and findings. One can see that there are a number of things that can be incorporated into this section and the list shown is only a few of several dozen potential items that could be placed in this part of the document. One should always remember that the report should be shaped around its audience and properly formatted as required if applicable.

The final portion of a research project is one that can balloon the size of a project. However, if required, it is absolutely crucial to include any supporting documentation that was used in the project. Anything that is included in this section should be a clean and high-resolution copy of any applicable documents. If nothing else is included, a bibliography or works cited section is at a minimum included in this section.

The slide that is presented here gives one some suggestions as to how the qualitative research report method presented in this part of the module can apply to educational research and/or instructional design. While these are only limited suggestions for application, one can be very creative in their study to apply the report structure presented to accommodate the audience(s) they hope to reach out to.

#### **Part 4 – Application of Qualitative Research in Readings**

Qualitative research studies are not terribly difficult to create a construct as authors provided in this module's reading. This part of Module #2 includes the presentation of three (3) qualitative research studies applicable to education and instructional design when applicable. Each one of these are critically important to better understand educational research and instructional design (ID).

The first sample that was included in the readings has to do with a research study that James Osler and Mahmud Mansaray (2014) completed on single-subject qualitative research designs. One critical concept that can easily be applied to educational research and should be noted from the research study are single-subject research design. This is the investigation of events that are time intensive in nature (several days to several months or longer). One word of caution of this method is that it can be data intensive and should only be used in smaller population samples and groups.

Knowing the core concept in play being single subject research, what were some of the results of the analysis? First, there is evidence that there is a growing literature base which is encouraging for better instructional content design. Secondly, the use of this research type could potentially influence outcomes because of gender and age. Thirdly, through different methods, relationships between teaching effectiveness and student learning were high. Finally, validity and reliability are still suspect with single-subject research designs. Until more research is done on this type of method, it will remain limited in nature at best.

The second sample of qualitative research focuses on a study that Carol Rinke and Diovanna Stebick completed on a teacher inquiry culture. This is a concept which is commonly based on constructivist approaches of instructional design/technology. A constructivist approach is one which asks students to review and reflect on their personal work ethics and how they motivate learners. The goal of this research study was to determine whether or not interactions with students and other faculty would change when using online tools more than offline tools and physical classrooms.

While the use of a teacher inquiry culture was a bit off the beaten path when compared to the first study, there were some nuggets of wisdom that came from this study. Above anything, tenured teachers viewed this as a disconnection from classroom practices already in place. This could result in a lack of a meaningful change in the teacher inquiry process / product in addition to student teachers providing cohesion to the community of learners reviewed.

The third and final example that is presented here to help show diversity in the topics that qualitative research can present applies to a research study that Stephen Yancher, et. al. (2010) completed on how instructional designers spend their work time when creating products. This type of study is more of a classic application of qualitative research. What resulted was a number of common themes that instructional designers apply to creating materials through theory, intuition, and judgement. As seen in the article, there was some clash between traditionalist thinkers of instructional design and new-age persons which are fairly new to the scene.

Conclusively speaking, there are talking points that can come away from the application and use of qualitative research studies. Above anything, Theory's role in instructional design and its effectiveness in modern times is still very important to apply in order to come up with effective research projects on learning and design. Sad but true, there may continue to be disconnections between student teachers and tenured professionals in education. Next, the teacher-inquiry culture is very important to the design of quality and effective instructional products – offline or online. This leads to a recommendation that improvements are still needed in order for consistent design structures to be formed, implemented, and executed.

### **Module 3 – Quantitative Research Methods**

#### **Part 1: Introduction to Quantitative Research**

Quantitative research methods are the most commonly used method in educational research. Though rich in data and is numbers-based, it is critical to review thoroughly to apply these methods in instructional design. The goal of this module focuses on having a solid understanding of quantitative research by applying a similar approach as the previous module on qualitative research through the following key points:

- General Definition and Concept of Sampling
- Review of Hypothesis Testing
- Commonly Used Methods in Quantitative Research
- Application to Instructional Design

While it is easy to try to compare and contrast the two methods, one is recommended to go into this module with a clear head assuming that they never saw the other methods provided in this course before. This will help one get the maximum benefit of the topic at hand.

Quantitative research models are ones which can measure patterns and trends in data for larger population samples. This part of Module #2 includes an overview of the concept of quantitative research, reasons why one should conduct quantitative research studies, and drawbacks of this research method.

Going along with the theme that is presented here, what is the purpose of quantitative research? Realistically, it is to measure something or someone. That's for sure. The main purpose of this type of research is to take raw data and derive conclusions from them. There are a number of ways to achieve this goal which includes hypotheses, population samples, and confidence intervals. Although more complex in some eyes, it can provide a similar amount or higher amount of data that can affirm or disaffirm an existing theory or challenge one's own.

In determining the specific types of research designs, the Baltimore Country Public School system came up with four (4) commonly-used types of quantitative research designs. This and the next three (3) slides after this one provide a summary of these methods. Starting with one which has looser variables in the research study is descriptive research. This one applies systematic information and is fairly structured when compared to the others. This is more optimal when data has already been collected from previous studies which are getting a second review or glance over.

Correlational research continues down the pike of the offerings from the BCPS. This one focuses on patterns and one thing leads to an end or outcome. An example of this is a relationship between grades and the amount of time online learners study on a weekly basis for a course. Variables are more controlled here but only to a limited degree.

Moving on to a more complex research study of quantitative research, quasi-experimental (or casual-comparative) research studies have an even greater emphasis on cause and effect. Control groups on the general population are commonly used which yields a moderate amount of control of variables in a research project or study.

The most comprehensive research model that the school system provides and can arguably be the most commonly used is experimental research. This type of research uses some type of controlled environment where a study would take place. For the sake of conversation, a learning management system (LMS) is a fantastic example of this. One variable is all that is measured and analyzed while the others are there but

more for window dressing. The absolute control of the variable helps prove or disprove a hypothesis (which we will talk about in a moment).

There are a number of different reasons that one would want to do a quantitative research study. The next three (3) slides show these reasons why. To start, the richness of data received is second to none. Statistical analyses can determine trends, patterns, and additional conclusions above and beyond the hypothesis. This can lead to additional studies on the topic in question.

The second reason that one should choose this research method is that quantitative research studies are optimal for larger population samples. Although qualitative research studies can be performed with larger groups, this type of research can be distributed to a larger sample for less cost per participant. Another benefit is that they can be done in a number of different ways or a combination of thereof as seen here.

The third and final reason is that in most cases, research results derived are commonly independent of the author(s) conducting the study. This conclusion is led by a couple of key points. First, it assists in strengthening the credibility of the study being conducted, enhances the validity of the research study, and is the strongest argument for research independency which leads to a reduction or elimination of bias.

While quantitative research surely has its advantages, there are some critical disadvantages that can't be ignored. The biggest hurdle of this method is that there is no formal categorical or organizational method to classify data with. There are theories and thoughts but inconsistency is almost guaranteed from one study to the next. Secondly, there can be information overloads on researchers and participants. Thirdly, the concept of confirmation bias can creep in. This, in short, has a researcher focus more on proving a hypothesis and not on the process it occurs or doesn't occur. This could be the result of information gathered and concluded is too general or specific in nature and the only way to get a research study done is to steer it towards a specific outcome.

## Part 2: Hypothesis Testing

One of the core concepts of quantitative research is the use of hypotheses. Qualitative research methods depend on the use of hypotheses in order to prove or disprove outcomes from research studies conducted. This part of Module #3 focuses on the following relating to hypothesis testing:

- Overview of what hypotheses are,
- Decisions that can be concluded from hypothesis testing,
- Errors that could potentially occur,
- The concepts of significance levels and power.

So, what is a hypothesis? In a nutshell, a hypothesis is a statement which is made about something in the world we live in. It is usually the end result of something that **will occur** in the future. It applies the use of independent, dependent, and extraneous variables and is the basis for quantitative studies but could be applied in a modified way to qualitative research studies too.

When looking at hypothesis, there are two (2) and **ONLY** two (2) that are a result of a result study. The null hypothesis is one which you want to prove wrong and reject. This is commonly used to state that there are no correlations or differences between variables. Alternate hypothesis, on the other hand, are ones which you want to study. This is commonly a statement of variables and how they relate to others.

Having an understanding of hypothesis is very important but what is even more crucial are the outcomes that can result. The next pair of slides (this one and the next) show four (4) common outcomes that can

occur with hypotheses. They are the following: as presented to us in the article written by Reames & Kerneny:

- A true hypothesis is rejected which results in Type I Error or false alarm
- A true hypothesis is not rejected which is a correct decision
- A false hypothesis is rejected which also is a correct decision, and
- A false hypothesis is not rejected – Type II Error which is known as a miss.

Errors that are made in hypothesis testing are critically concerning because they could result in a domino effect of issues big and small. Type I errors are the first stop here because what is concluded is that a conclusion where there is a stated relationship between variables when in fact none exists. The use of an alpha / confidence level is provided to determine the likelihood that this error *would* occur. A lower alpha level yields better results.

Type II errors, although not as severe, are just a difficult to reign in. The issue at here is that there is no difference or relationship when one actually exists. Thus, it can challenge the ability to determine differences between variables measured. Although the alpha level is applied here as well, the use of power (or emphasis on not committing the error is adjusted to have a maximum benefit too if at all possible.

Thus, hypothesis testing is a backbone of quantitative research. Here are some conclusions that one should focus on as it is **very important to understand as it is a foundational concept of educational research** above and beyond quantitative thinking.

### **Part 3: Commonly Used Quantitative Research Methods**

There are a number of different techniques that can be used to gather quantitative data for a research study. However, there are several shown below that are regarded as the most likely ones to be used are reviewed in this part of the module. They include statistical analyses & questionnaires; data tracking & physical observations, and assessments or tests.

Starting off with questionnaires and statistical analyses, Kirkless and Muijs provides us with excellent evidence of the most common method to acquire data for a quantitative research study. This commonly done via software titles like SAS & SPSS since it can calculate necessary functions and results in a few nanoseconds. While the private example shown gives some clues as to how a questionnaire is created for statistical analyses, one thing is for certain. They must have a definite purpose in order to achieve maximum effectiveness and be concise since longer surveys may cause numerous cases of keyboard face or face ink blotches.

Shown on this slide are a number of reasons to use statistical analyses and questionnaires. As you're going through the module, please think of a couple of additional ways that these could be applied to a quantitative research study.

While the use of this method is good and swell, there are a few drawbacks that can make it a nightmarish living Hell. The biggest concern out of the ones in the opinion of the course guide is the overload on information. Data received can be hard to determine what is useful and what isn't and that could dampen the validity of the data set amongst other things. The other reasons are equally as important but realistically the effectiveness for complex issues is another commonly stated reason to use something else.

Data tracking and physical observations are the second pair of ways quantitative research data can be had. Note that this is more of an old-school approach with a new car shine. These focus on the analysis of

movements, occurrences of a specific item, or combination of both. While the observer can be hidden or visible, there are a few ways that data can be recorded as seen on the bottom half of the slide. It is possible that one could measure more than one way but the concern of information overload should be heeded if it would yield too much data.

Sampling of a population is commonly where the physical observations uses the concept to its maximum potential. Realistically, there are many ways to sample populations and the three (3) most common ways are provided for one to review here. It is surely possible to do two (2) or all three (3) at the same provided that the hypothesis can be accepted or rejected as of a result  
Caution should be heeded because they may individually result in different conclusions that could make it difficult to determine which one aligns with the hypothesis and which one(s) don't.

The final pair of quantitative methods that seem to go together are assessments and tests. These methods, commonly used in educational research, are effective for instructional designers and educational researchers due to ability to review data in real-time when tests are taken. Although they are out to determine patterns of some kind, they should be limited in nature to prevent participant fatigue. Nobody would want to have a participant fall asleep at the wheel during a research now, would they?

Unlike other methods, there is one unique characteristic about these quantitative testing methods. The key difference is that they measure reactions at a specific point in time. Arguably, they could measure it over time if the tests were done over and over or in a frequency. While there is commonly a heavy use of closed-ended questions (as mentioned later on the module in more depth), they shouldn't be so long that participants are fatigued by them. Applying the KISS principle ensures a higher participation rate and more accurate results.

#### **Part 4: Quantitative Research Examples Applicable to Educational Research**

As one could see via research, there are thousands upon thousands of studies conducted for the betterment of educational research. Three articles shown within this part of the module focus on a couple of different points of view that can be tied back to educational research. They come from the private industry and academia which can go hand-in-hand like peanut butter and jelly. Let's look briefly at those now in the upcoming slides.

The first article that was part of the reading material that one should pay attention to was a private industry application. A group of authors led by Guo-Heng reviewed simulated learning systems for international trade. Their purpose of the study was to challenge ways to innovatively engage learners in online courses for better business acumen in international trade. The most important thing that one could easily apply in quantitative research is the use of a system usability scale (SUS). This method's mode of action is to determine the effectiveness of a system. If one thinks about it, this can be easily applied to the effectiveness of an online, offline, or blended learning course.

Knowing the use of a SUS was their main plan of action, what happened in the study. From the results, they saw that the first iteration (much like a draft of a paper) was not acceptable. The second iteration was better but not still within standards. Also, the virtual system used could of caused some skewness in the results. Overall, they felt additional changes were required even though improvements were made.

Richardson, Maeda, & Swan's article on performance based application of quantitative research methods is the next stop of the three (3) article tour. Here, their topic focus was on self-assessments and their view of perceived learning versus cognitive learning. They applied questionnaires to attempt to get as many people to participate in the survey to determine attention levels of online courses. In their opinion and results, the study proved to be successful overall considering their survey was fairly concise.

The third topic review which is more of an overarching theme provided some additional gold nuggets of wisdom as to effective quantitative research studies. Here, the analysis Stes and company completed focused on learning outcomes for new teachers that were implementing new instructional development programs. The hope was to see better assessment scores from students and teachers through the use of better instructional tools. While their population was small compared to other studies reviewed, the study netted positive results. Thus, this and the other examples provided show that quantitative research can accommodate a number of different topics but still hold a central theme of educational research and instructional design & technology.

SAMPLE

## **Module 4 – Designing Effective Instructional Design Research Tools**

### **Part 1: Optimizing Data Collections**

Now that students have a firm understanding of the two (2) most common types of research, the next part of the course briefly describes a couple of key points related to doing blended studies and best practices for research studies in general. The module focuses on best practices for research and ways to optimize data for research studies. Next, the revisit of ethical considerations is the second item on the board. Finally, creating effective measuring instruments concludes the module. The goal of this part of the course is for one to be able to apply knowledge of various types of research studies in an effective and efficient manner.

Up to this point, there has been a lot of conversation and focus on the two (2) most common research methods. A third one is important to explain briefly since it is a combination of the two. Mixed method studies combines both qualitative and quantitative research method elements and has been around for roughly 20-30 years and has gained popularity more as of late. Since it is more optimal for moderately-complex studies, it is a common tool that could be used in educational research and instructional design.

The graphic that is shown here shows that all three (3) major designs of research apply to educational and instructional design research. No one method is dominant over another and when one or more are used, it is commonly a product of mixed methods research.

Now it is time to look at the best practices of research. Author Sam Searle provides researchers of all types, knowledge bases, and skill levels a four (4) step guide to conduct research studies. In short, they are the following...

- Meet and exceed regulatory requirements
- Research prior to the start of a project or endeavor
- During the project, do several key items explained in a moment
- Finally, execute some backup practices towards the end of the study.
- 

The next few slides will go in-depth for each step.

The first step is a fulfillment of obligations. In order to effectively collect data, researchers must meet and exceed all necessary regulatory requirements in order to successfully begin the research project. In academic, this is commonly the Institutional Research Board (IRB) but could be other governing boards or leadership teams when applicable. This step also includes explanation of impact to research, costs (if applicable), and documentation of data. A pre-project research proposal may be required if requested as well.

The second step is the pre-project research. What does this mean in one's mind? Basically, it is the time spent in determining who would own the data and deliverables as well as how long it would be available prior to destruction. Note that this is different than copyrights and trademarks since those are more overarching possessive rights. The biggest focus here relates to the data collected and whether or not it can be passed along to others. Also provided for one to see is the ethical concern that can pop up as well as a benefit which most see as a hindrance instead.

The third step is the processing of data and collection of it. One must make formats of data collection that are easy for both the researchers and participants of a study. There should be a strategic storage plan with at least a couple of layers for research study continuity. Finally, there should be some type of indexing and organization of data because this helps streamline the process to retrieve data and reference as part of project's requirements.

The final step that is present here of this suggested process is towards the conclusion of the research project. Here, data is shared and the research study is published. Note that this is a challenging aspect of the project because of ethical concerns, proprietary data rights (if applicable), and the potential reuse of data. Also, data that was collected, unless, required, must be destroyed in some way. A couple are listed here. Even though not all of the aforementioned would apply to one's research study, it is important to use some of these suggestions.

So what are some of the end results for using a process like this? There are several that are mentioned here that one can apply. Particularly important, the first and last points are the most impactful to educational and instructional design research.

## Part 2: Best Practices for Research Studies

Armed with an understanding of how one can approach a research study effectively, the next step in the natural journey is to focus on the collection of data. Thus, this part of the module focuses on suggestions for research studies, research-specific suggestions, and reasoning behind effective data collection practices.

Starting with qualitative research studies, the first main way to commonly collect data are interviews. Mentioned before a general sense, this is once again a formal or informal way to gather data from a subject within a research study. Much like a survey, this includes closed-ended and open-ended questions and can be with one person or a number of persons at the same time.

Observations is the second most common method that qualitative research studies are comprised of. One should remember that this a formal method to physically see what a subject is or not is doing. There are a number of different ways to record observations and the three (3) most popular methods are shown on the slide. Depending on the study, one may use one or more of these methods in order to get necessary data from a population sample.

To expand a bit further, there are several ways that sampling can occur. Sampling mind you can apply to **any method provided** to one here in the course. Each of the methods that were highlighted in the reading Watt and company provided us in the readings are shown on the slide. Note that lecture capturing is one of the newer methods but can apply to screen captures as well – which is commonly used in a business setting.

One final method to show here that qualitative research studies use in some cases are diaries and journals. Note that this method is commonly reserved for studies that are for longer periods of time because they are fairly complex and take the longest to analyze and comprehend. Note that it can be done in a number of ways and usually with a very small sample size of 10 people or less. The only exception to this is if it is a collaborative project where there are several researchers working on the collective means to a result.

To round out this part of the presentation, here are some key advantages and disadvantages of qualitative research collection methods. Please take a moment to become familiar with these provided as they are helpful to know when determining if this collection method is good to use for your study.

Moving along to the next type of research studies – quantitative research, one should take a moment to refresh their mind as to what is included in this type of study. While sampling was discussed in the first research method, it is a bit more specific here as researchers have the power to randomly choose where subjects go or purposely put then in a control group or or uncontrolled group. The concepts of mean (or

average), median (the frequency of the middle value), mode (most frequently seen result), and range are common here. One should also remember that hypothesis testing is paramount here.

So, let's now look at the common methods of quantitative research. The first one is counting studies. This is when one records the number of times something happens. Fairly simple, it is then commonly graphically presented in a bar chart, pie chart, or other graphical figure. Depending on what is measured, small to medium-sized population samples are good for this method.

Questionnaires and surveys are up next for commonly used quantitative research methods. Note that people often tend to get these confused because they do a similar job of obtaining data from participants. However, one should know that questionnaires are an integral part of a survey and a subset of them. Just like the structure of the qualitative research portion of this presentation, here are some key advantages and disadvantages of qualitative research collection methods. Please take a moment to become familiar with these provided as they are helpful to know when determining if this collection method is good to use for your study.

The final item on the board research-wise are mixed methods. The set of authors shown below provide some context and substance to this research method that is coming around. Information here was provided to one a part ago in this module and is placed here for reference and review.

The uniqueness of mixed method research studies is that it **combines** methods from both qualitative and quantitative research methods. These are shown below. The main reason why they are gaining steam in terms of popularity is that they are more flexible than their singular counterparts.

Closing out here, one can now come up with a stronger view of the goals of educational research. Summarized in one sentence, the goal of education research (as well as instructional design research) is to prove a point and extend further the body of knowledge and do it in a way that is socially acceptable and ethically plausible.

### **Part 3: Ethical Considerations in Data Collection**

Throughout the course, ethical considerations for educational research has been mentioned several times. There is a very good reason that this has purposefully been done. As seen in the literature, there is steam being accumulated in the way we learn and thus, research studies in this area must be proper in order to help further the goal of increasing that body of knowledge. This module focuses on three (3) ethical policies created which shape the way researchers conduct studies.

The second step in the ethical journey that one should be aware of is the Belmont Report of 1979. Coming more than 50 years after the Nuremberg Code, this one applies the use of informed consent, beneficence, and protections for participants.

The most recent application, though original to the scene in the 1950's, is the revised edition of the American Psychological Associations policies and procedures on ethics. Above anything, this is the most applicable to educational research and instructional design. Goals of little or no harm of participants, development, focuses on integrity and honest, and an importance of confidentiality are some of the things they suggest all researchers in academia to follow.

As we reviewed ethics for the final time in the course, how could it be applied to educational research? Here are some tips that are vital to their success. First, subjects that are part of experiments and research studies are the highest priority. This is without question the most important thing that could be said for research in general. Next, data collected should only be used for a limited amount of purposes. While this

can apply to current and possible future studies, this leads to the third point that there must be a heightened focus on data privacy. As long as these are met, a study will be accepted provided they apply with their respective guidelines for submission.

In closing, there are two (2) other things to mention about the application of ethics in educational research. First, one should implement the 'Platinum Rule' in research. Here, the requirement which is a good method to use for research is that one should be as accommodative as possible with respect to their needs and requirements for a research study. Also, with the increased popularity of online research studies, careful attention should be applied to disclaimers of the study with at the minimum what is provided on the slide.

#### **Part 4: Creation of Sample Collection Methods**

Knowing the fundamentals of various research methods is only half the battle. Creating them is the other half. Thus, this part of the module focuses on the application of methods provided, including...

- Recommendations for effective research studies,
- Research proposal framework, and
- Applying skills to create sample measurement tools.

Above anything, one must pay careful attention to the details provided here as this is a core skill that must be learned well to create effective research projects.

The best place to start with collection method creation are some general fundamentals. A number of different items to consider when creating effective research studies are provided here on the slide. Each one is mentioned in detail on the slides ahead of this one.

The best place to start with collection method creation are some general fundamentals. A number of different items to consider when creating effective research studies are provided here on the slide. Each one is mentioned in detail on the slides ahead of this one.

Next, the purpose of the research study is in focus. It should be clear, concise, and straight to the point. While the purpose has no required length, it should be comprehensive enough to describe the purpose of the study without boring the reader or causing them to lose interest. A paragraph or two is common here.

External considerations is the third item on the checklist for effective research collection strategies. One should remember that these are located in the environment that the study takes place in can have a set of challenges in their own. As seen, the two (2) questions can significantly alter the way data is collected, analyzed, and concluded and great care must be taken here in order to have a positive research experience for all.

Similar to the previous point, environmental considerations is next on the list. This more focuses on the what and where of where the research project is going to take place. The more details that are considered here, the better. However, with online studies, there are limitations that are usually assumed with the type of learning management system (LMS) used if applicable.

Sometimes, the use of incentives may be required in order to meet a specific target for a population sample or research purpose. Sometimes, they are needed in order to get more people to participate in a study than originally provided. Be careful not to abuse this or the results and future studies may see it as a requirement to get any participation at all.

Above anything, one of the last points here is the confidentiality of data and participants time and feelings. Researchers must assure participants that their data provided is not given to others and is only used for an intended purpose. Commonly, per requirements by an Institutional Research Board (IRB) or a professional body, there must be disclaimers and terms or conditions provided to participants and a hotline or method to report breaches in confidentiality.

Moving along towards the end of the module, the next item on the board is a framework for a research study or proposal. Applying everything up to this point presents an outlined suggestion by Watt and company that is commonly used in research studies. As been said before a number of times, there may be additional requirements or sections above and beyond this framework. One would be encouraged to review what that may be if applicable to their situation.

Here are some limitations of the framework provided. Remember, this is not a be-all, end-all solution. It is merely a guide that one could use and common challenges are listed here for one to review.

The last item for this module requires one to take a bit of time at looking at limitations on measurement tools. While one attempts to avoid it, there are a few limitations on measurement tools. Time, question quantities, transitions, and how to administer them are some of the more common issues with measurement tools like surveys, interviews, and the like. Unless used as evidence to prove the hypothesis or statement, formal documents are better than hand-written ones.

## **Module 5 – Data Dissemination Best Practices & Personal Reflections**

### **Part 1: Evaluation of Data Collection Methods Used**

Armed with knowledge of the three (3) most common ways to collect data and some methods to achieve that, our attention now turns to the evaluation of research conducted. This concluding module focuses on several key points with relate to data evaluation and data collection processes. The theme here is net of the research study tools mentioned and the review of data. A final piece on instructional design and reflections rounds out the course.

Although not widely used, the measurement and successfulness of data that is collected is a critical step to ensure that everything was done to get the best data set for a research project. There are some common misnomers that people jump to when it comes to research studies. As seen, more data isn't necessarily better and the fact that data only having one use are common when people are looking at studies from outside the world of research.

The next part that is going to be touched on a second time but is just as important as the first go around is the concept of validity. One should remember that this is a determination of how strong a conclusion, inference, proposition, or hypothesis is. While purposeful manipulation may take place, it is common to have a number of internal threats which can taint a research study.

While internal validity are sometimes easier to control, external validity is a lot more challenging. The environment is the wild card here and the choice of an environment will likely determine whether or not a project will have a high or low level of validity. Interactions with other things is one of the more common threats to external validity.

To look at validity from a different point of view, here are some validity types that are ranging from a weak level to a strong level. Each of these can apply to internal or external validity proofs. One should become familiar with these as they are not only important to look out for but may be on quizzes and exams for the course.

Similar to the concept of validity, reliability was brought up a time ago as well. Here, one should put a bit more time into the concept as it is a determination of whether or not a measure gives consistent results time in and time out. With consistency being the key word, the three (3) ways shown are not only the most commonly used but the ones which will prove a tangible result for a researcher. The test – retest option is usually the most common out of the three (3) when used in academic research studies.

While measuring the validity and reliability of a data set and research study is important, population sampling just as much so. One simply can't interview or observe all in a population as it is physically impossible to do so. Hence, only a portion of the population can be chosen to represent the whole. Doing this, though, does have its issues as seen with errors and bias.

The last thing to get the ball rolling in this module is hypothesis testing. One should remember that hypotheses are critiqued on the fact that data collected was reviewed and validated. It is possible that major errors can occur because researchers may *attempt* to sway results into one decision or pattern of thought. It is good practice to always have a healthy discussion piece on the results of the study because if it is relevant to the hypothesis, it is likely to have higher levels of validity and reliability.

## **Part 2: Procedural Review of Data Collection Process**

Once the data has been collected and the research compiled, the final step in the process to compile a research report. This can be done in a number of different ways but for the purpose of the course, it is presented in an academic point of view. This part of the module will focus on the following...

- Review of data via creation of a research report and steps required to compile one
- Dangers of research reports and studies
- Sharing of data and resources

The overall concept of this presentation walks one through a implied report that is a bit different than one mentioned earlier in the course. To start, a brief rundown of the research project report would be the final stop for any data received and disseminated into a useful form. Thus, this and the next slide shows a skeleton structure that is common for more academic and professional research reports. Note that this, like the other suggestion, can vary depending on requirements from officials or managers.

One you have completed review of this and previous slide, please move on to the next slide in the sequence. Thank you.

So, you have the report structure, gathered your literature, reviewed it, and did the same with your data results from the study. This leads to one question – why does it matter to put it into a formal document template like the one just shown or others mentioned in the course? Well, these five (5) reasons are some of the many that could be argued for a professional and consistent report structure. Uniformity and consistency tends to garner the most lookers as reasons here.

While doing a research paper, there are a number of land mines one must be very careful not to step on. There are a number of different issues that can come about from a research study which can take even the most popular topic and place it into the trash can. Here, inefficient literature review, although minor in comparison of other problems, is one of the most common fault that is bound to happen. Having too much or too little to back up a point becomes a question of one's opinion and how what was collected relates to the issue/topic at hand.

Here are a couple of other issues that come with research studies that are more severe than a bad or inconsistent literature review. Note that citation errors and plagiarism are seen more as major infractions because of the lack of providing one credit for their work. If looked at it from another angle, it could be considered theft (but not commonly). The consequences of the faults mentioned are provided as well.

Moving on to a growing issue in research studies, the sharing of data and distribution of it is now one of the most talked about topics in academia. Everyone in a global world wants to share something with others. Data is no different and it is important that policies vary from one entity to next on data & research study sharing. Though it is common to keep it in-house for the most part, there are few that are warming up to an idea that data can be shared provided credit is given or a partnership is formed for some common purpose.

## **Part 3: Application to Instructional Design**

Being a course that is near the completion of one's degree, it is important to understand how what was learned here as well as ones taken in the past apply to a degree one is about to receive. This part of the module assists in...

- Providing reasoning why research is critical to instructional design (ID) and technologies

- Research and technological use in the classroom/training facility
- Benefits and drawbacks of ID research

The end is coming soon for you, the student that is wanting to get a degree. Whether it is in instructional design or some other faucet of education, why should one have to go through all the labor to create reports and publications for the sake of doing it? From the instructional design (ID) point of view, it is an emerging field of study since it is more relevant in the way that we learn and teach others. While most people associate instructional design with online materials, it can be offline too and applies to all age groups – young and old.

To help get a better understanding of why to study this field more in-depth and take a career in it at some level, this and the next slide provides one with a brief tour of ID history. Note that there is a progression of technology from the early days of chalkboards and ditto machines (where purple ink stains were king and smeared papers were queen) to learning management systems and mobile learning nowadays. Please take a moment to review the next three (3) slides and then continue on with the presentation. Thank you.

Similar to layering a cake, we have the pedestal as the foundation of educational and instructional design research, the cakes as the purpose, and the timeline as the icing between the layers. The topping that shapes the pinnacle of the cake are the benefits and drawbacks of educational research and instructional design. When one reviews these over the course of this slide and the next, it will continue to grow as a research topic as technology becomes more integrated into learning. It is not to say that it will not be done without controversy and people questioning its relevancy in educational research.

Regardless of whether or not people may accept the fact that educational and instructional design research is relevant, the overall point of the research in these areas is to grow them. As time goes on, this will open up additional research areas that have yet to be discovered.

#### **Part 4: Self-Reflection & Future Applications**

Piggybacking off the previous part of this module, the future is certainly bright for instructional design and education research. This final part of the course focuses on a couple of points that are on a reflective note – including...

- Globalization and its role in educational research,
- 'Predictive' future of educational research and instructional design research, and
- Conclusions

The globalization of learning has been the most radical change in the industry since the mass application of computers back in the 1980's and 1990's. The changes have not only been physical and mental but professionally as well. Here are some reasons why of each of these aforementioned areas:

The next thing that one should focus on is to peek into the future and see what is in the future for educational research and instructional design research. Note that the biggest note is the infusion of technology. Since it is more important than ever, the application of artificial intelligence and subject matter experts will be key. Mobile learning initiatives through watches, phones, and wearables like holographic glasses will add additional dimensions to learning.

As we come to a close, it is only fair to attempt to predict the future of educational research and instructional design. While looked at years from now as only an educational guess and likely a wrong prediction, here is what the course guide and others he knew guesses what the future would hold. When

looking at educational trends, the challenge of how technology benefits or harms others and the application of social media is the first area that is going to receive far more attention than it does now.

Other predications that could come out of the crystal ball of academic and professional learning include the likelihood of more interactive learning modules, virtual reality studies, and better economic cost / benefit analyses.

And as of a result, we have come to the end of the course. The hope that one that now sees educational research as far more dynamic and exciting as it is great time to further the knowledge base of education. Instructional design is become ever more popular and important to academic and professional organizations. Thus, the goal of providing one the tools needed to create effective research studies and projects is hoped to be achieved here. Best wishes for the future.

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