

Development of a Framework to Determine the Status of Instructional Design and
Technology Artifacts

Matthew S. Ames

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and State University in
partial fulfillment of the requirements for the degree of

Doctor of Philosophy

In

Curriculum and Instruction

Ken Potter, Chair

John K. Burton

Barbara B. Lockee

David M. Moore

April 7, 2015
Blacksburg, VA

Keywords: History of Instructional Design and Technology, Historic Method, Information
Seeking, Artifacts, Framework.

Copyright 2015, Matt Ames

**Development of a Framework to Determine the Status of
Instructional Design and Technology Artifacts**

Matt Ames

ABSTRACT

Components from the historic method, information seeking, and the history of IDT were used in conjunction with systems thinking to create a framework to determine the status of documented artifacts related to the history of IDT. The study used the following steps: (a) conduct a literature review in order to explore possible components for the framework; (b) analyze the results of the literature review to provide a rationale for selection criteria of these components; (c) design the framework that will be used to search for documented artifacts; (d) develop the framework and operationalize the components; (e) evaluate the framework with operationalized components; (f) where necessary, revise the framework based upon tests of the framework; (g) report the results (h) design a way to share the framework and the status of documented artifacts. Sixty-nine documented artifacts were searched for using the framework and sixty were located.

Acknowledgements

I would like to acknowledge several people in instructional design and technology at Virginia Tech. First, I'd like to thank Dr. Ken Potter for his superior patience in me while I took my time throughout this process. He kept giving me chances and things finally came together with this study. Second, I'd like to thank Dr. Lockee who was so wonderful when I first got back into the program and provided me with new insights into the world of instructional design.

I would also like to thank my parents, David and Carol Ames, for allowing me to find my own path in life. I'm sorry dad that I didn't let you write that chapter that you wanted to add.

TABLE OF CONTENTS

Abstract	ii
Acknowledgements	iii
List of Figures	x
List of Tables	xi
Chapter 1: Introduction and Need for Study	1
Statement of Problem	2
Purpose of Study	9
Significance of Study	9
Chapter 2: Literature Review	13
Artifacts	13
Historic Method	16
Information Seeking	18
Classic and Standard Model	19
Dynamic Model	20
Information Seeking Stages	21

Other Approaches	22
Strategies	23
Histories of Instructional Design and Technology	24
Saettler	25
Iverson	29
Kruse	30
Lembo	32
De Vaney and Butler	33
Molenda	34
Reiser	35
Other historians	36
Summary of the Literature Review.....	36
Chapter 3: Research Method	37
Introduction	37
Purpose of Study	37
Benefits of Study	37
Research Questions	38

Research Design: Design and Development Research	38
Procedures for Phase One: Design and Development	40
Selection Criteria	40
Testing the Framework	41
Sampling	42
Data Analysis Techniques	43
Summary	43
Chapter 4: Results	45
Introduction	45
Results of the Literature Review and Analysis	45
Framework Design and Development	45
Searcher	48
Tools	48
Information	48
Inputs.....	49
Processes	49

Outputs	49
Putting the Components Together	52
Pre-Search Stage	52
Inputs	52
Processes	52
Outputs	55
Search Stage.....	56
Searcher.....	56
Tools	56
Information	56
Processes	56
Formulate	57
Select.....	58
Filter.....	59
Verify	59

Extract	60
Post Search Stage	60
Testing	60
Test One	61
Tests One and Two	62
Data about Status	62
Data about the Function of the Framework	67
Test of the Final Nine	71
Turning the Framework into a Sharable Document	71
Potential Users	71
Design Strategies	72
Summary	74
Chapter 5: Discussion and Conclusions	76
Introduction	76
Discussion of Results	76
Next Steps	80

References.....	82
Appendix A.....	90
Appendix B.....	98
Appendix C.....	99
Appendix D.....	100
Appendix E.....	103
Appendix F.....	105
Appendix G.....	106
Appendix H.....	108
Appendix I.....	113
Appendix J.....	115

List of Figures

Figure 1 Organization of Categories	54
---	----

List of Tables

Table 1 Early Organizing Framework for Artifact Search Tool	47
Table 2 Systems Thinking Components Applied to IDT Artifacts	51
Table 3. Artifacts Found and Not Found and Corresponding Category	63
Table 4 Location of Documented Artifacts and Corresponding Category	65
Table 5 Artifacts Found in Digital Spaces	66
Table 6 Complex Searches Per Category and Number Found and Not Found	72

Chapter 1: Introduction

Before the historians (Saettler, 1953; Iverson, 1953; Lembo, 1970; De Vaney and Butler, 1996; Reiser, 2001a; Reiser, 2001b; Molenda, 2008; Kruse, n.d.) of instructional design and technology (IDT) sat down to write their histories, they had to examine an array of tangible and intangible artifacts that provided them with the information they needed to write their histories. They examined artifacts related to IDT that had survived into their present and used these to write historical narratives. Their histories did not come about until the historians engaged in, “a continuous process of interaction between ... facts (and) an unending dialogue between the past and the present” (Carr, 1961, p.6). This interaction between facts and a dialogue between past and present was an interaction between artifacts that had survived into the historian’s present and the questions the historians intended to answer with these artifacts. They could not have written their histories without the artifacts and neither can future historians write more histories if existing artifacts disappear.

It is essential to explore how one might go about determining the status of documented artifacts related to the history of IDT. Without some way to contextualize the artifacts that survive, they exist in a vacuum separated by time and space. Gaddis (2002) pointed out in *The Landscape of History* that, “We’re bound to learn from the past whether we make the effort, since it’s the only database we have; and ... we might as well try to do so systematically” (p.8-9). There is a choice: We can do nothing to make sense of or organize the past, or we can approach the past systematically and arrive at conclusions that help us understand and organize it.

Statement of Problem

The current status of documented artifacts related to the history of IDT is often unclear and information regarding the creators of these artifacts difficult to locate. Some documented artifacts and archives have gone missing, been destroyed, or have deteriorated to the point they are unusable. Other artifacts have been mislabeled and resources have gone unpublished. The locations of artifacts that do exist often are unknown or are inaccessible via electronic means. In addition, some background information that could establish the credibility of the creators of the documented artifacts or the publications referencing those artifacts is limited or non-existent. In order for current and future IDT historians to be able to create new histories it is important to be able to determine the status of the documented artifacts related to the field.

The main need associated with this problem is the need to develop and test a framework that can be used to explore and determine the status of documented artifacts related to the history of IDT. This study documents the development of such a framework and tests the utility of the framework in exploring the status of artifacts that were part of the history of IDT.

There is inadequate documentation of the current status of documented artifacts created between 1900-1950 by IDT practitioners. Although this history was documented by Saettler (1953) and Iverson (1953) in the same year and by several other IDT historians (De Vaney and Butler, 1996; Reiser, 2001a; Reiser, 2001b; Molenda, 2008) since, little attention has been paid to the status of documented artifacts that make up this early history.

Beginning a study of the documented artifacts in the 20th century makes sense because these artifacts can more readily be directly related to IDT. Unlike studies of the drawings in the caves at Lascaux or Comenius' *Orbis Pictus*, both of which histories of IDT occasionally mention as having an instructional purpose, by moving into the 20th century we can more easily relate artifacts to what is now known as IDT because there are clear connections between early and later 20th century practitioners. For example, The Association for Educational Communications and Technology (AECT) evolved out of the Department of Visual Instruction (DVI) and individuals involved in the creation of DVI created numerous artifacts of their own inside and outside the organization: books, pamphlets, instruction, surveys, plans, notes, etc. These artifacts are a part of IDT's history.

The status of some of these artifacts is clear. For example, at the time this study was conducted, an original copy of Anna Verona Dorris' (1928) *Visual Instruction in the Public Schools* could be purchased from Amazon and Dorris' influential book could be found in many libraries. Unfortunately, the fate of other artifacts, such as those created or acquired by C. R. Reagan, is less fortunate. Reagan was founder and president of the Film Council of America and the first president of the National Association of Visual Education Dealers (Saettler, 1953). He was also Educational Advisor in the Office of War Information. In September of 1948 Paul C. Reed, of the U.S. Office of War Information, spoke of Reagan:

I never knew a man who worked so sincerely for what he believed in than C.R. Reagan. He believed in the power of audiovisual to make this a better world in which to live and he worked tirelessly and selflessly for that cause. (Info Comm, 2014)

Unfortunately, it would be difficult for historians to create a history of Reagan's work because his personal archives were destroyed before archivists with the National Audio Visual Association could reach them. In the April 1957 edition of *Education Screen and Audio Visual Guide* there was an article titled *Archives Request That Came Too Late* (Kruse, 1957) in which Kruse explained how the National Audio Visual Association (NAVA) had contacted C.R. Reagan's widow after his death to request that his personal archives be donated to the NAVA but those artifacts had recently been destroyed. In the same article Kruse noted:

The loss of the Reagan papers can never be made up. This loss, like those suffered in the destruction of the files of other giants of our field -Thomas E. Finnegan, William H. Dudley, George Klein among them- can only be minimized by vigorous cooperation on the part of the whole field to prevent similar losses. (p.176)

Finnegan was an educator who worked as director of the educational film production project while with the Eastman Kodak Company, Dudley was a prominent figure in the visual instruction movement, and Klein was the publisher of the first educational film catalog to appear in the United States (Saettler, 1990). Klein was promoting silent educational films in New York in the 1920s, Reagan was an educational advisor in the Office of War Information, Dudley edited instructional films for the Ford Motor Company, and Finnegan helped to develop a comprehensive series of silent educational films for the Eastman Kodak Company (Saettler, 1990). These men were associated with pioneering efforts involving the application of audio-visual instruction and worked in highly influential organizations. Because their personal archives were destroyed, current and future historians may never be able to understand the full impact of

their efforts, their connections to other figures, their insights, or to view photographic documentation of their pioneering activities.

Fortunately, there are some archives that currently maintain artifacts related to the history of IDT. At the Department of Audio-Visual Instruction's (DAVI) Atlantic City Convention in 1951, Dr. E. Winifred Crawford proposed the establishment of an Archives and History Committee and an Archives Library (Moore, 1997). The archive was started to preserve valuable documents that record the beginnings and the development of the use of audio-visual materials in education, and to make these materials available for researchers. These efforts evolved into the AECT archive at the University of Maryland, which holds many artifacts related to the history of IDT. The archives of AECT span the period from 1912 to 1984, with the bulk of the material dating from 1940 to 1970. The collection contains correspondence, articles, catalogs, convention material, minutes, reports, pamphlets, serials, teacher guides, bound ledgers and scrapbooks, catalog cards, and audio-visual material (including photographs, audio cassettes, audio reels, slides, and overheads) (Moore, 1997).

Much of the AECT archive was organized and collected by William Kruse. Kruse was appointed DAVI archivist in 1955 (Lembo, 1970) and among the AECT holdings is an unpublished history of the field by Kruse titled *The Projected Image* (n.d). In the guide to the AECT archive this history is erroneously referred to as Kruse's dissertation; it was not Kruse's dissertation. A section from Kruse's *The Projected Image* was published in the *Journal of the Society of Motion Picture and Television Engineers* under the title Willard Beach Cook: Pioneer Distributor of Narrow-Gage Safety Film and Equipment (Kruse, 1964). In the introduction to Kruse's book, *The Projected Image* was described as an, "unpublished book length manuscript"

(p. 576). Though Kruse's unpublished book appears to be extensive, none of the other historians (Saettler, 1953; Iverson, 1953; Lembo, 1970; De Vaney and Butler, 1996; Reiser, 2001a; Reiser, 2001b; Molenda, 2008) discussed in this study referenced it and Kruse's long history appears to not be very well known.

The AECT archive houses several taped interviews with prominent figures in the field such as Edgar Dale, Dean McClusky, Kenneth Norberg, Elizabeth Golterman, and others. Unfortunately, artifacts eventually deteriorate and in Butler and De Vaney's (1996) history of the field they stated, "We looked forward to listening to Dr. McClusky's audiotape, but it was unclear" (p.13). Half of all American films made before 1950 and over 90% of films made before 1929 are lost forever (Kehr, 2010). An examination of the histories of IDT showed that several of the appendix items listed in the back of Lembo's (1970) dissertation had deteriorated beyond recognition. These appendix items include photographs of events and minutes. The current status of *Fit to Fight* (U.S. War Department, 1918), a silent educational film used in large scale research studies (Saettler, 1953), is unknown (Elsheimer & Pifer, 2012).

The Lee and Lida Cochran Association of Educational Communications and Technology Archive at the University of Northern Illinois is an archive of early instructional technology hardware. This archive houses hundreds of artifacts including equipment such as the Victor Animatograph Cine Projector, several brands of magic lantern, and a Polyorama Panoptique (Butler & Rabak-Wagener, 2003). The items on display are available for research, teaching, display, demonstration, and reflection.

The awareness of the status of other hardware created by early practitioners and developed by companies such as DeVry, Keystone, Bausch and Lomb or Bell and Howell seems

mixed. For example, the *Classroom Communicator* was a device used to test students in the 1940s (Saettler, 1953) that is now difficult to locate. However, other technologies, such as film projectors, slide projectors, and magic lanterns can often be found for sale in large numbers on eBay.

Other artifacts related to the history of the field can be found in archives not specifically related to IDT. For example, an analogue version of George Zook's 1935 *Proposal for the Establishment of an American Film Institute* is located in folder 2131, box 222, subseries 2, series 1 of the General Education Board Archive of the Rockefeller Archive Center. At the time of the proposal's publication, Zook was president of the American Council on Education and the proposed document was an attempt at standardizing educational films. This archive is analogue, exists in Sleepy Hollow, New York, and currently cannot be viewed from any other location.

Other artifacts can be found on the Internet. *Visual Instruction in The Public School* (Dorris, 1928) is located on The Internet Archive. A version of *Visual Instruction: Its Value and Its Needs* (McClusky, 1931) can be found on the Documents from the Motion Picture Producers and Distributors of America digital archive. *The Wheat Farmer* (2014), a digital reproduction of an educational film from 1938, can be viewed on YouTube. Copies of *See and Hear Journal* are located on The Internet Archive. The Media History Digital Library provides Portable Document Format copies of *Educational Screen* from 1922 to 1962. Many of these documents have been digitized by the Prelinger Library, a private library that curates an online collection of public domain materials.

Ironically, in spite of their efforts to create meaningful artifacts, some of the people involved in the creation of these early artifacts are difficult to find information about. Lorraine

Noble, for example, was active in the educational film movement of the 1930s (Saettler, 1953). Saettler described her involvement at length while De Vaney and Butler (1996) mentioned her only in passing; information about her now seems difficult to find.

Even finding information about IDT historians such as Lembo, Saettler, and Kruse proved to be difficult. Diane Lembo's (1970) dissertation, *A History of the Growth and Development of the DAVI/NEA from 1923 to 1968*, was an extensive study about the development of the DAV and was eventually published in ten parts in *Audiovisual Instruction* from September 1971 to June/July 1972. However, no information about Lembo's activity after this could be located.

To find out if Paul Saettler was alive, I took several steps: First, I searched for his name in Google, I then asked several professors at Virginia Tech if they knew the status of Saettler, next I searched obituaries on the Internet, I emailed Rebecca Butler, (R. Butler, personal communication, December 12, 2012) and I made a phone call to Saettler's publisher. None of these activities helped to determine the status of Paul Saettler. Finally, I emailed Robert Reiser (R. Reiser, personal communication, December 20, 2012). Reiser emailed Michael Molenda (M. Molenda, personal communication, January 2, 2013) who confirmed that Paul Saettler had died in 2003 in Washington State.

William Kruse (n.d.) wrote the only unpublished history of the field discussed in this study. Kruse was active in IDT from the 1930s and into the 1970s. He wrote for *Educational Screen*, was appointed DAVI archivist in 1955 (Lembo, 1970), and had a section of his history of the field published in the *Journal the Society of Motion Picture Engineers* (1964). He was noted

with frequency in Lembo's history of the DAVI. In spite of his active involvement in the field over the course of many years, current credible information about Kruse proved difficult to find.

To summarize what is known about some of the documented artifacts related to the history of instructional design and technology:

- There are known missing archives (Reagan, Finnegan, Dudley and Klein).
- There are mislabeled and unpublished histories (Kruse).
- Some sources have deteriorated (McKlusky's taped interview, Lembo's dissertation).
- Some artifacts exist only in analogue format in specific locations.
- The status of some artifacts is unclear (Fit to Fight).
- Information on historic figures can be difficult to find.

Purpose of Study

The current status of documented artifacts related to the history of IDT appears to be unclear. The main need associated with this problem is the need to develop and test a framework that can be used to determine the status of documented artifacts related to the history of IDT. This study documents the development of such a framework and tests the utility of the framework in exploring the status of artifacts that were part of the history of IDT. In addition, this study explores the development of a website as a way to share information about the framework and the status of documented artifacts.

Significance of Study

Proponents of history have insisted that history has a great imaginative power, that it broadens the mind and exposes students to the full range of human possibilities unburdened by time and space (Mandler, 1992). Once organized, histories allow practitioners to perceive a field's evolution, gain an understanding of the values of the field, appreciate previous activities and help disciplines clarify their identities. Knowing the history of a discipline allows practitioners to see how their current and future efforts are derived from previous activities, providing them with a historical context for their own work. The knowledge gained from historical inquiry can help create a foundation to understand present concerns (Hopkins, 1976).

History provides disciplines with a context to understand the activities of individuals. This context can help practitioners identify with their discipline and develop a stronger appreciation and understanding of the efforts and the direction of their discipline. It is difficult to appreciate advancements in knowledge, policy, science or technology without an understanding of the circumstances within which these developments occurred (Berg, 2004). The insights of historians provide practitioners with an understanding of how the values of their discipline have changed and evolved over time. They capture a discipline's relationship to society, the tools that were used, and the overall cultural context. Saettler (1953) stated in his introduction that, "By a study of the past, the role and pragmatic worth of audio-visual communications may be evaluated in relation to the present and the future" (p.8). Histories help people understand a discipline's place in the world.

Without a sense of history individuals and groups lack identity (Bryant, Black, Land & Porra, 2013). A person with no memory cannot establish an identity because she does not know where she came from, or what forces made her the way she is. Without an understanding of the

history of IDT, practitioners lack a framework from which to understand their field. With an available history, IDT practitioners can appreciate their work as part of an ever-evolving field.

The economist, Joseph Schumpeter (1950) stated that any discipline must have four components: empirical data (observations and facts), theories/paradigms, an ethics, and a history. Well known disciplines with histories include art, science, literature, philosophy, and architecture. Practitioners from these disciplines such as Pablo Picasso, Albert Einstein, Earnest Hemingway, Plato, and Frank Lloyd Wright are well known even outside of their disciplines. Lesser known disciplines also have histories and important, valuable figures. A brief survey of academic disciplines reveals many lesser known disciplines have histories of their own including: psychological anthropology (D'Andrade, 1995), nursing (Klainberg, 2010) and cartography (Bagrow, 1964).

There are known histories of IDT (Saettler, 1953; Iverson, 1953; Lembo, 1970; De Vaney & Butler, 1996; Reiser, 2001a; Reiser, 2001b; Molenda, 2008) that have helped to provide the discipline with a historical identity, an appreciation of previous activities, and an understanding of the people involved in the development of the field. They also provide an understanding of how values have evolved, and how theories, approaches, and technologies have been used by former practitioners. Several of these qualities can be found in Lembo's (1970) *A History of the Growth and Development of the DAVI/NEA from 1923 to 1968*. Lembo's history provided practitioners with an understanding of the values and identity of people involved in the development their field and an understanding of how the AECT evolved from the DAVI.

It is important that practitioners of IDT have been, and continue to be, involved in the analysis and writing of histories of the field. The archivist Hill (1979) stated:

It is a mistake to leave historical analyses of the social sciences to professional historians. Historians, as disciplinary outsiders to the social sciences, typically do not understand our intellectual and organizational projects. In order to recover our own disciplinary history and advance our intellectual understanding of past events, social scientists must learn to use materials that historians have staked out traditionally as their own. (p.4)

There are wider potential applications for the artifacts related to the history of IDT. More histories can be organized. The documented artifacts related to the history of IDT have been used to clarify the development of organizations related to the field (Lembo, 1970) and to describe the early development of the field (Saettler, 1953; Iverson, 1953). De Vaney and Butler (1996) were the first to write a post-structural history of the field and Rosalind Rogoff (1980) used the instructional films of Thomas Edison to write a description of instructional design elements in Edison's films. Rogoff's work would not have been possible without the existence of Edison's early instructional films. As long as the artifacts related to the field exist, and are organized and known, there are possibilities for their use, and the field will continue to be capable of enriching itself with new histories.

Chapter 2: Literature Review

There does not appear to be a specific model that deals directly with determining the status of documented artifacts related to the history of IDT and, as a result, this literature review focused on the following areas to explore how the status of documented artifacts might be determined: the historic method, information seeking, and the history of IDT. These areas were selected because each offered something that seemed to provide insight into the issues explored in this study. The historic method describes the way historians use artifacts to write their histories, information seeking describes how people search for information, and histories of IDT contain approaches to exploring IDT's past, a way to organize this history, and information about documented artifacts related to IDT. Each of these domains has some relation to documented artifacts and how people look for these artifacts.

Artifacts

The word *artifact* is derived from the Latin *ars*, for *art* or *skill*, and *factum*, for made or done, and is used to describe almost any created entity. Artifacts may be described as the products of human action that exist independently of the creator (Gagliardi, 1992) and may also be thought of as objects that are the products of human skill and ingenuity (Erlhoff & Marshall, 2008). They can be viewed simultaneously as part of our collective memory (Middleton and Edwards, 1990) and as the, “fragile residue of memory crafted into a mental representation by an individual” (Hagan, 2007, p.23). Artifacts are made by people, exist independently of their creators, and are a part of our collective memory.

Howell & Prevenier (2011) argued that, “... artifacts ... have been left by the past (and) ... (t)hey exist either as relics, what we might call ‘remains’, or as testimonies of witnesses to the

past” (p.17). Beliefs are represented in the permanent artifacts of a culture (Olson, 2004) and, “Because artifacts, primarily texts, have come to occupy such a central place in both the form and the growth of knowledge it is tempting to see these representations as “embodiments” of knowledge” (Olson, p. 231). Artifacts can be thought of as things that store our knowledge of the past and, when examined, can help us understand our beliefs and the world.

Historians use artifacts to make sense of the past and construct knowledge by creating historical information based on inferences they make from the artifacts they examine (Howell & Prevenier, 2001). These artifacts take many different forms: books, articles, recordings, architecture, spoken words, photographs, film, bones, pottery, diaries, etc. Artifacts have also been described (Erlhoff & Marshall, 2008) as:

The artifacts of a scholar’s research can include books, lectures, Internet postings, and e-mails. Cultural and religious values, beliefs, and systems of thought are expressed through the artifacts they produce. In archaeology, an artifact is anything that is not part of the “natural” earth surrounding it, and in medicine and astronomy, artifacts are observational anomalies—visual errors on a film plate or the by-products of the observing technology itself. (p.27)

Artifacts are often associated with history. The main impetus of historical research is the collection of information and the interpretation or analysis of this information (Berg, 2004). Artifacts are a historian’s tangible connection to the past and what they use to examine the past. For example, Laura Thacher Ulrich (1991) used the diary of Martha Ballard to write a history of 19th century rural America. The diary provided her with enough information to make inferences about the daily lives of people from the past.

Artifacts can take many possible forms and have been classified in many different ways (Hopkins, 1976), including:

- Physical remains: historic sites, roads, aqueducts, pyramids, buildings, furniture, human remains, clothing, food, utensils, pottery, implements, weapons, machinery, industrial processes, and fine arts and museum pieces of many kinds.
- Orally transmitted material (sometimes converted to writing), such as folklore, legends, ballads, tales, anecdotes, sages, traditions, customs, manners, burials, ceremonials, social institutions, and language.
- More elementary and durable kinds of representative or artistic materials, not written in the ordinary sense, such as inscriptions baked upon clay, chiseled stones, monuments, stamped coins, woven tapestries, vases, scenic or portrait sculptures, historical paintings, and portraits.
- Hand-written materials (sometimes in print), including papyri, bricks bearing cuneiform writing, vellum or parchment manuscripts, and more recent documents such as chronicles, annals, biographies, memoirs, diaries, and genealogies.
- Printed books, papers, and literature.
- Motion picture film, microfilm, and recordings, including radio and television.
- Personal observation (by the writer or by people whom he interviews).

Numerous specific artifacts related to IDT have been documented in the histories of the field. Saettler (1953) cited over 400 artifacts in his history, Reiser (2001a) used less than 70, Iverson (1953) 303, Lembo (1970) approximately 300 artifacts, De Vaney and Butler (1996) 131, and Molenda (2008) 81. The historians used these artifacts as ways to create their histories.

When Diana Lembo described how the DVI was formed in 1923 she used the National Education Association (NEA) proceedings from a conference in Oakland and an interview with Dean McClusky as artifacts to help her create a description of this period. Because these artifacts were available she was able to use them to create a narrative about the history of IDT at that time.

Artifacts come in many different forms and are created for a variety of reasons. They are the product of human activity and if they survive into the present can be used by historians to write their narratives. Artifacts are essential to the creation of IDT histories and without them it would be impossible to continue to write these histories.

Historic Method

The historic method is a time-tested method for pursuing the activity of history and has been used since the sixteenth century to refer to the writing of history or the work of historians (Cheng, 2008). The historic method also has been described as: Thinking about the particular ways in which other historians have conceptualized, researched and written about a subject (Doddely & Norton, 2011), texts which address philosophical issues that apply to history writing, books that address epistemological issues and how historical knowledge can be verified (Howell & Prevenier, 2001), and as a method for discovering, from records and accounts, what happened during a past period (Marshall & Rossman, 1999).

Artifacts in the form of documents are an essential element in the historic method. Leopold von Ranke, a historian who worked in the 19th century, is credited with bringing history into the modern era by convincing other historians that the archive is the place that history should be done (Howell & Prevenier, 2001). According to von Ranke, history has the potential

to be a real science if historians use the documents found in archives to write their histories (Howell & Prevenier, 2001). Ranke's influence over historians was far-ranging. For example, a French methodological text (as cited in Eskildsen, 2008) from the 19th century began, "History is done with documents...lacking documents, the history of immense periods of the past of humankind is forever unknowable. For nothing can replace documents: no documents, no history" (p.451). By the early 19th century documented artifacts, in the form of documents, became central to the activity of history.

In the *Historian's Craft* (1953) Bloch stated, "The variety of historical evidence is nearly infinite. Everything that a man says or writes, everything that he makes, everything he touches can and ought to teach us about him" (p.66). Bloch used a socio-economic approach to study the lives of ordinary people and argued that history could benefit from using approaches such as anthropology, geography, economic sociological models, linguistics, philology, comparative literature, folklore, agronomy, and other disciplines (Donnelly & Norton, 2011; Lyon, 1987). With this new approach, the number of potential artifacts for historians to use increased.

The historic method has been referred to as the agreed upon ground rules for researching and writing (Donnelly & Norton, 2011), and as a process for determining the accuracy of statements made about events (Brickman, 1973). Howell & Prevenier (2011) have described the historic method as a process that includes the critical appraisal of primary sources, the physical framing of the work as a history through the use of footnotes, indexes and references, the acquisition of substantiating and countervailing evidence, the establishment of facts from this evidence, an explicit purpose or function, the use of generally accepted interpretive models, and coherence between the work and sources.

The processes that are a part of the historical method are similar across the different methods used by historians (Brickman, 1973; Hopkins, 1976; Berg, 2004). For example, what Hopkins referred to as, “The accumulation of source materials, their classification and criticism, and determination of the facts” (p. 119), Berg (2004) described as, “Identify and locate primary and secondary data sources” (p.215). Brickman addressed this step as, “The accumulation, classification and criticism of source materials” (p.91). There may be slight changes in language, but similarities in historic methods appear to be common.

Information Seeking

Information seeking is an area of study that describes how people search for information. Information seeking is thought of as, “the consequence of a need perceived by an information user, who, in order to satisfy that need, makes demands upon formal or informal information sources or services, which result in success or failure to find relevant information” (Wilson, 1999, p.251). Others (Russell-Rose and Tate, 2013) simply define information seeking as a journey between need and fulfillment. Marchionini (1995) describes information seeking as, “a process in which humans purposefully engage in order to change their state of knowledge” (p.5).

Several models of information seeking have been proposed by different researchers (Dervin, 1983; Ellis, 1989; Kuhlthau, 1991; Marchionini, 1995). Some of these models focus on the procedural aspects of information seeking, while others focus on behaviors and how people make sense of information they encounter on their searches. A common procedure for information seeking researchers is to observe the behavior of information seekers in a controlled situation and then use these observations to construct a model (Marchionini, 1989). These models can then be used to improve upon search systems.

Classic and standard model. Robertson (1977) describes the classic model of information retrieval as a system based model whose main function was to match a document with a query. Robertson says the model is:

... so simple as to seem almost trivial at first sight; the essential components are a set of possible index records, a set of possible search formulations, and a match function which partially orders the documents in response to the search formulation. (p.129)

Essentially, in the classic model, an information need uses a query to match up with a document.

Critics of the classic model argue that it focuses too much on the document component of information seeking and ignores the role of the user (Russell-Rose & Tate, 2012). Eventually, models were developed that took the information seeker into greater consideration. For example, the standard model goes to greater lengths to describe the role of the information seeker. Marchionini's (1995) model makes the seeker central to the activity of information seeking and at each phase there is a specific activity:

1. Recognition and acceptance of an information requirement
2. Definition of the information problem
3. Selection of appropriate source that might address the problem
4. Formulation of a query
5. Execution of a query
6. Examination of query results
7. Extraction of information from result documents
8. Reflection on the process

Each of the steps found here involve decisions made by an individual interacting with a search system.

Dynamic model. Bates' (1989) model accounts for changes in users' information needs as they gained new insights from the information they encounter while seeking information. Bates places her model of information search within the context of the universe of interest of the search and within the universe of knowledge of the search. In doing so she makes any resource available to an information seeker. Bates describes this process in the following manner:

Furthermore, at each stage, with each different conception of the query, the user may identify useful information and references. In other words, the query is satisfied not by a single final retrieved set, but by a series of selections of individual references and bits of information at each stage of the ever-modifying search. A bit-at-a-time retrieval of this sort is here called *berrypicking*. (p. 410)

Bates (1989) points out that during an information search, each new piece of information provides the user with new insights, ideas, and a new way to look at their initial query. According to this view a query is always shifting based on new information. What Bates recognizes is that interacting with information can lead to new goals and that these goals are not satisfied by a single discovery but by engaging in what she refers to as *berrypicking*.

Information seeking stages. Ellis (1989) bases his model on studies of information seeking behaviors. In this model the information seeking process is not viewed as a step-by-step process but as different activities that made up the search for information. According to Ellis, how the features of the search interact will depend upon the information seeker and the environment in which they work. The activities Ellis describes are:

- Starting: The means employed by the user to begin seeking information.
- Chaining: Following footnotes and citations in known materials.
- Browsing: Semi-structured searching.
- Differentiating: Using known differences in information sources as a way of filtering the amount of information obtained.
- Monitoring: Keeping the search process up to date.
- Extracting: Selectively identifying relevant material in an information source.
- Verifying: Checking the accuracy of information.
- Ending: Tying up loose ends through a final search.

Ellis argues that information retrieval systems based on these characteristics will be helpful to information seekers because they follow the natural information seeking behaviors of individuals. An Internet search using this model might proceed as follows: An information seeker begins by searching from a certain webpage (starting); then follows links to relevant sources (chaining); explores the website containing queried information (browsing); selects one website over another (differentiating); bookmarks a webpage (monitoring); selects specific information from the search (extracting); checks the validity of information (verifying); and decides when search is over (ending). These eight steps take the information seeker from the beginning to the end of the information seeking process. Ellis (1989) tested his model on several groups including social scientists, English literature researchers (Ellis & Oldman, 2005), and engineers (Ellis & Haugan, 1997).

Kuhlthau's (1991) model complements Ellis' (1989) but adds an affective dimension. For example, during the initiation phase of the information search, a person may experience a lack of

confidence or anxiety. During the presentation phase, the final phase in Kuhlthau's model, feelings of relief are common. Kuhlthau (1993) describes the information seeking behaviors of library patrons by describing six phases: initiation, selection, exploration, formulation, collection, and presentation. During the initiation phase there is the recognition of an information need. After this initial step the general topic is chosen in the selection phase. During formulation the task is to form a focus of the information encountered. The collection phase includes gathering information related to the topic and during presentation the task is to prepare the findings.

Other approaches. Dervin and Nilan (1986) use an approach they call *sensemaking* to explain how information seekers make sense of the information they encounter during their searches. Their approach, though not a model, is a set of assumptions, a theoretical perspective, a methodological approach, a set of research methods, and a practice designed to cope with information (Dervin & Nilan, 1986). The goal of this approach is to explain how people construct meaning out of the information they encounter. Other sensemaking theorists describe why people seek information and what they do with that information (Blandford & Attfield, 2011).

Some information seeking researchers (Klein, Moon & Hoffman, 2006) describe the sensemaking process as a product of a data-frame theory of sensemaking. According to this theory, sensemaking occurs as a result of the continual framing and reframing of incoming data. O'Day and Jefferies (1993) studied business analysts and observed three information seeking tasks: monitoring topics, using strategic searches, and exploring topics in undirected manners. In

the time between their searches, analysts organized the information found during their searches. This reorganization of the information helped them to make sense of their activities.

Pirolli and Card (1995) describe information seeking as a type of foraging. The foraging analogy describes the behavior of information seekers as they focus within a specific area, instead of looking in multiple areas for information. This type of behavior occurs when a specific area has proved to be more fruitful than others at providing information. For example, an information seeker may stay longer on a specific website because of the abundant and useful information found there.

Strategies. Information seeking researchers (Bates, 1989) point out that the more strategies information searchers use, the greater the possibility of them finding the right information. These strategies include: term tactics, which refer to tactics for adjusting words or phrases within a query; information structure tactics, techniques for moving through information or links to find sources or information within structures; query reformulation tactics which include narrowing a query by providing more specific terms; and monitoring tactics, which refer to ways information seekers keep track of their searches (Hearst, 2009).

Histories of Instructional Design and Technology

The majority of the activities examined and written about by the IDT historians (Saettler, 1953; Iverson, 1953; Lembo, 1970; De Vaney and Butler, 1996; Reiser, 2001a; Reiser, 2001b; Molenda, 2008; Kruse, n.d.) occurred in the 20th century. It was during this century that organizations such as the DAVI evolved and developed, technologies such as overhead

projectors were built, instructional theories were researched, and individuals sought to define their activities in a clearer manner through books, journal articles, magazines, and conference presentations.

It was from these activities that artifacts related to the history of IDT came into being and eventually found their way into archives and other collections. Example artifacts include: Anna Verona Dorris' *Visual Instruction in the Public Schools* (1928), minutes from a DAVI meeting in 1927, a Bausch and Lomb magic lantern projector, and William Kruse's (n.d.) unpublished history of the field. It is from this collection of artifacts that a historian in the field might select artifacts for their history.

Every piece of history has a method from which the artifacts are selected, filtered, and understood (Green & Troup, 1999). Saettler (1953) states in his introduction that, "a historical background be provided so that the long effort of educators to make the abstract more real and understandable may be evaluated in relation to the values of the modern school" (p.5). Each of the historians of IDT use an approach to help them understand the artifacts they use to tell their stories. The historians listed here used numerous artifacts in various ways to describe and create their histories. For example, when Diana Lembo (1970) describes how the DVI was formed in 1923 she used both the NEA proceedings from their meeting in Oakland and an interview with Dean McClusky.

Saettler. Saettler's (1953) dissertation, titled *The Origin and Development of Audio-Visual Communication in Education in the United States*, was the foundation for what eventually was thought of as the most comprehensive and far reaching of the histories of the field. Saettler states in his introduction, "this study represents the first historical investigation of audio-visual

communications in all its broad ramifications” (p.15). Saettler’s dissertation was accepted in 1953 and would form the basis for a book titled *A History of Instructional Technology* (1968). Before his book was published, parts of it were distributed by the NEA as *The Technical Development of the New Media* (1961). Eventually, *A History of Instructional Technology* became *The Evolution of American Educational Technology* (1990, 2004).

Saettler’s *The Evolution of American Educational Technology* (1990, 2004) is widely viewed as a classic in the field of IDT. De Vaney and Butler (1996) say of Saettler, “Paul Saettler has written an admirable history of the field, and that task need not be repeated” (p.2). Reiser (2001a) references Saettler extensively and Molenda (2008) states in his history that, “It draws heavily on well-known sources, such as Saettler’s (1990) comprehensive history “(p.5). Lembo (1970) was aware of Saettler and stated:

Saettler’s comprehensive and vast (over 1,500 pages in two volumes) dissertation is a detailed overview of the audio-visual movement in American education. Through the use of the extant primary sources covering a wide range of factors that are a part of the history permitted the author to develop a generalizable guide of the audio-visual movement. (p. 34)

Lembo also found limitations in Saettler’s work and states, “In the brief references to the establishment of the DAVI, the author’s dependence on only a few sources produced an oversimplification that distorted the situation” (p.25). But Lembo also adds, “Saettler’s study, nevertheless, being the first on the history of the movement as a whole, was an invaluable and informative guide” (p. 35).

Of all the histories discussed here only Kruse (n.d.) and Iverson (1953) do not reference Saettler (1953). Iverson may not have been aware of Saettler’s dissertation at the time because he

defended his dissertation the same summer as Saettler. Kruse was aware of Saettler; both men had published histories in the special 40th anniversary of *Educational Screen and Audiovisual Guide* in 1962.

Saettler's (1953) states the purpose for his history was to:

- 1.) Provide a general account of the primary antecedents in the origin and development of audio-visual communication in the public schools of the United States.
- 2.) To examine the basic concepts, movements and trends evolving directly or indirectly from these antecedents.
- 3.) To develop a unified historical perspective of audio-visual communications in the public schools of the United States. (pp.5-6)

In addition to these purposes, Saettler (1953) added that there had not been a comprehensive history written before, that the audio-visual movement needed to be adequately documented, that many of the people who played a part in the development of the field were dying, and that there should be a way for students to assess the role of audio-visual communications in the educational process. Saettler also argues that, "a historical background be provided so that the long effort of educators to make the abstract more real and understandable may be evaluated in relation to the values of the modern school" (p.5).

Saettler (1953) states that his study, "confined itself to tracing in outline the general development of this field" (p.8) and explains that he is interested in an orderly approach to his research. As the title of his dissertation points out Saettler's main focus was the United States. Saettler wrote this about the historic method:

The historical method of research has three well defined divisions which have already been established. This study, in accordance with these processes as outlined by Good, Barr, and Scates, first, collected the source materials necessary for its evolution; second, critically analyzed the materials and finally, attempted to present the data which followed an intelligible form. (p.32)

He adds that, “This study was, organized according to a definite chronological and topical plan, which was pursued throughout the investigation” (p.40). Saettler describes his historic method in great length and mentions the importance of gathering source materials.

Saettler (1953) used over 400 artifacts in the 1465 pages, not including bibliography and appendix, of his written dissertation for an average of about 3.6 artifacts per page. These artifacts include: interviews, personal letters, and the literature from the field. Using these documented artifacts allowed him to draw a consensus from his sources and interpret these, “whenever it was deemed necessary for exposition” (p.10). For the majority of his dissertation Saettler seems to use his sources to directly reference information from them with very little interpretational lens. Saettler even states, “Injection of opinion or bias into the presentation of the data was consciously reduced to a minimum” (p.41).

In some cases Saettler (1953) uses a single artifact to make several points. For example, Saettler uses *Motion Pictures in Education in the United States*, a report prepared by Cline Koon, to make several points: that the use of motion pictures in education had been unorganized and neglected; that less than 10 percent of schools in 1934 made use of the motion picture in instruction; and that there was no agency that school systems could turn to for help. Koon’s report was extensive and Saettler was able to use it as a source for several pages of his

dissertation. Sometimes a single artifact can provide historians with a wealth of information for their histories.

On page 658 Saettler (1953) uses seven artifacts to write about the early development of visual education courses. To do this he references sources for direct quotes and also to list a set of names associated with the development of visual education courses. The artifacts he uses include an unpublished book by Dean McKlusky, Weber's *Picture Value in Education*, a course outline, and several magazine articles.

Saettler used Chicago Style as the citation style for his dissertation, an approach common in histories. His bibliography was divided into the following sections: books, bulletins, periodical articles, publications by organizations, parts of series, public documents, reports, unpublished material, and newspapers.

Iverson. Iverson's (1953) dissertation on the history of audio-visual instruction was accepted one month after Saettler's dissertation. Iverson was active in organizations related to the field and was mentioned by Lembo (1970) occasionally in her history.

Iverson (1953) uses the first nine pages of his dissertation to outline his plan of study, the significance of the problem, previous research, and his outline. He states that his purpose for writing his history is, "to trace historically the use and development of audio-visual techniques as they have functioned in educational procedures of the past half century" (p.2). Iverson recognized that tremendous cultural and technological changes had taken place in the United States since 1900 and that, "A thorough search of the literature has revealed little evidence of any comprehensive effort to treat historically the scope and influence of audio-visual techniques" (pp.5-6).

Iverson (1953) is straightforward in his use of artifacts and there appears to be a direct connection between his use of artifacts and his history. When Iverson wrote about the Educational Museum of the St. Louis Public Schools he states, “The first of such museums, to be established was the Educational Museum of the St. Louis Public Schools, established in 1905 as the result of the efforts of C. G. Rathmann, an assistant superintendent of schools” (p.109). Iverson references Ramsey’s (1938) *Educational Work in Museums of the United States* to provide a description of the events that can be found in the original document, “Thus the product of Rathmann’s vision, interest and effort opened in October 1905, as the first Educational Museum of the country” (p.170). Historians directly use the information found in artifacts as Iverson did here.

Iverson (1953) does not go to great lengths to clarify the nature of his historic approach and did not mention the historic method he was using. He uses a chronological approach to write his narrative. Iverson uses the Chicago Style citation and his bibliography contains the following categories: books, serials and pamphlets, government documents, newspapers, manuscripts, letters, and personal interviews.

Kruse. Kruse worked for Bell and Howell for 17 years and was the head of several departments there (Ross, 1999). He was an advertising representative and writer for *Educational Screen and Audiovisual Guide* (1957) and was appointed archivist of the DAVI in 1955 (Lembo, 1970).

Kruse (n.d.) went to great lengths to ensure the field of IDT had an archive for future research. Much of the AECT archive located in Hornbake Library at the University of Maryland is the result of his efforts. The first three boxes in the archive contain correspondence by Kruse in

his efforts to find materials for the archive, Kruse's sources for his unpublished manuscript about the history of the field, and numerous photographic collections.

The AECT archive at the University of Maryland refers to Kruse's unpublished work, *The Projected Image* (n.d.), as his dissertation, but it is not his dissertation. A portion of what is referred to as Kruse's dissertation was published in *The Journal of Society of Motion Picture and Television Engineers* under the title Willard Beach Cook-Pioneer Distributor of Narrow-Gage Safety Films and Equipment (1964). In the editor's note to the article, what is referred to as Kruse's dissertation is called *The Projected Image*, "an unpublished book length manuscript" (p.576). The unpublished book is 430 pages long, heavily marked with notes and editing lines, and contains a mix of educational and industry observations

Kruse (n.d.) was the most outspoken of the historians and a strong proponent for the use of audio-visual communication. In his introduction he states:

It is high time, too, that the audio-visual specialist refuses to be looked down on as a Johnny-come-lately upstart. The roots of his professional family tree run deeper than those of the verbalist critic. That audio-visual education is at once the newest and the oldest form of learning known to the human race is the point of our first chapter. (p.1)

Kruse (n.d.) writes that his manuscript is for the, "audio-visual specialist, the teacher, the audio-visual industry worker, the person with a story to tell and lastly, all of us, citizens, as fellow-men" (p. 4). He is clear that he wants to show in his history that, "The audio-visual process - which integrates a learner's sensory experience with his apperceptual reservoir and thus fits him for better living in his society - is education" (p.1).

The artifacts used by Kruse (n.d.) were extensive and fill more than one box at the AECT archive in Maryland. They cover the years 1922 to 1967 (Moore, 1997). Because Kruse was actually involved in the development of the audio-visual industry from 1930 until the 1970s his history is a mixture of descriptions of artifacts and personal insights. When Kruse writes about lantern slide distribution between 1914 and 1923 he references a report by Dean McClusky as a source to note that slide distribution doubled in those years. Kruse also quotes from other authors such as the section of his manuscript that describes the religious use of audio-visual technology. Kruse never finished his history. His manuscript contains no bibliography, but references are listed occasionally within the text.

Lembo. Diane Lembo (1970) wrote *A History of the Growth and Development of the DAVI/NEA from 1923 to 1968* as her dissertation. It was published later in *Audiovisual Instruction* in ten parts during the early 1970s. Lembo states one of her reasons for her history is, “to objectify blinding nostalgia; to give recognition to the DAVI’s antecedents, founders, and successors; and to clarify present problems, based on insights from the past” (p. 3). In addition, Lembo mentions her main problem is, “to trace the origin and development of the DAVI of the NEA from its inception in 1923 to June 1 1968, with emphasis on the individuals, socioeconomic forces, and technological developments instrumental in its establishment and growth” (p. 4-5). In order to cover such a long history in a detailed way, Lembo required many artifacts.

Because the purpose of her research is to reconstruct a history of the DAVI, Lembo’s (1970) historical method is, “modified to provide a case history of the organization” (p.11). Lembo states that her chief techniques are the examination of documentary evidence and the

taped interview technique. Most of the documentary evidence used by Lembo was in the DAVI archive in Iowa¹.

Lembo's (1970) dissertation is over 1000 pages, almost 300 of which are appendices, along with 40 pages of references. She organizes her data along a chronological timeline and writes about advancements in technology and the increasing awareness of the potential of visual instruction. Lembo references an array of artifacts in her study: minutes, letters, newspaper articles, interviews, publications and reports. Many of her artifacts are primary sources which she subjected to, "external criticism to determine their authenticity and credibility" (p.12). Lembo organizes her artifacts on a four point reliability scale: absolutely, probably, possibly, and unreliable. Lembo also employs the Chicago style and uses the following categories in her bibliography: minutes, catalogues, directories, miscellaneous unpublished materials, newspapers, publications of the government, learned societies and other organizations, interviews, correspondence, telephone conversations, personal DAVI files, repositories, periodicals, dissertations, and books.

De Vaney and Butler. Rebecca Butler is president of the AECT History Committee and has written a number of articles related to the history of IDT for *Tech Trends* magazine. Ann De Vaney is Professor Emerita of Educational Communications and Technology at the University of Wisconsin-Madison. De Vaney and Butler (1996) were the first historians to examine the history of IDT from a poststructural perspective. Their stated purpose was to, "provide an epistemology which frames this study, because according to these theories, truths are socially and linguistically

¹ The archives once held in Iowa are now in the Association of Educational Communications and Technology archive at the University of Maryland.

constructed within and only within a discourse; they cannot be submitted to a transient authority for truth” (p.3).

An application of this method can be seen in De Vaney and Butler’s (1996) analysis of Hoban and van Ormer’s evaluation of research after World War Two. Hoban and van Ormer state, “This study lends support to the theory that relevant introductory remarks have an anticipational or motivational effect, as well as to the theory that learning results from the practice effect of repeating material in different symbolic forms “ (as cited in De Vaney and Butler, 1996). In their history De Vaney and Butler do not simply restate Hoban and van Ormer’s words but write:

A number of things occur in these quotes which clearly indicate the tacit formation of a professional discourse that will control entry into the field. It will constitute a style to be taught by professor to student. This rhetoric, complex with cumbersome sentence structure, yet with precise adjectives and nouns, is a laboratory style not seen to this extent in audiovisual discourse before this time. (p.28)

Before De Vaney and Butler (1996), historians such as Saettler (1953) and Iverson (1953) took information found in artifacts and added it to their narratives in a direct manner. But De Vaney and Butler express ideas beyond Hoban and van Ormer’s original intention by interpreting them through the filter of poststructuralist theory. De Vaney and Butler’s history offers new insights into how artifacts from the history of IDT might be referenced to write new histories.

Molenda. Michael Molenda has been active in the IDT community for a number of decades and only recently retired. Molenda’s (2008) history of IDT was written as a chapter for

the *Handbook of Research on Educational Communications and Technology*. Molenda makes it clear early on in his history that:

This brief history makes no claim to originality or heterodoxy. It strives for the opposite effect: to tell the story of the evolution of educational communications and technology as it is understood by mainstream observers. It draws heavily on well-known sources, such as Saettler's (1990) comprehensive history and the most recent overview of the main constructs of the field (Januszewski and Molenda, 2008). (p.5)

Unlike many of the previous historians in the field, Molenda writes about IDT in countries other than the United States and the development of IDT prior to the twentieth century. For example, he writes about 15th Century Korean epistemology, distance education in 1840, and European instructional television.

Molenda's (2008) artifacts are not organized by category and he uses a chronological approach to his history. In his conclusion Molenda states that, "Since its inception, the field of educational communications and technology has been characterized by changes in technology and radical shifts in its underlying paradigms" (p.18).

Reiser. Robert Reiser has been active in IDT since the early 1970s. Reiser (2001a; 2001b) approaches the history of IDT in a manner similar to Molenda (2008). His initial step in creating his history is to describe IDT (2001a):

The field of instructional design and technology encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources intended to

improve learning and performance in a variety of settings, particularly educational institutions and the workplace. Professionals in the field of IDT often use systematic instructional design procedures and employ a variety of instructional media to accomplish their goals. (p.53).

Reiser (2001a) seems to have been one of the first historians to clarify the history of IDT in terms of the design of instruction. This helps him to clarify the general boundaries of his history. In addition to this definition, Reiser points out that, like the AECT definition, his definition of the field contains design, development, utilization or implementation, management, evaluation, and analysis. This clarification allows Reiser to make the observation that the key activities of IDT practitioners were the use of media for instructional purposes and the use of systematic instructional design procedures. Reiser breaks his histories up into these two areas of activity: the history of instructional media and the history of instructional design.

Other historians. The AECT lists 35 artifacts on their history webpage (AECT In the 20th Century: A Brief History, 2015). Considering the length of time Dean McClusky was involved in IDT it is somewhat surprising that he did not publish a lengthy account of his experiences or a historical account. He did publish a historical article in the 1962 issue of *Educational Screen and Audiovisual Guide* titled *What Was AV Journalism in 1922* (McClusky, 1962). Almost 20 years later, when he was well into his 80s, McClusky published an article in the *Educational Media Yearbook* (1981) that contained a complete list of DVI, DAVI and AECT presidents.

Summary of the Literature Review

Several areas have been explored here, each of which is related in some way to artifacts or seeking for information. None of the areas discussed offer a specific approach to determining the status of artifacts related to the history of IDT. However, there are elements from the areas discussed that might help to provide a framework for determining the status of these artifacts. The historic method is a time-tested method for writing histories that stresses the importance of artifacts as documents. Several of the information seeking models have been shown to be successful at describing the information seeking behaviors of users. And the historians of IDT used different historic method approaches and artifacts related to the field to develop their histories.

Chapter 3: Research Method

Introduction

This was a design and development study to create a framework for determining the status of documented artifacts related to the history of IDT. The study used the following steps: (a) conduct a literature review in order to explore possible components for the framework; (b) analyze the results of the literature review to provide a rationale for selection criteria of these components; (c) design the framework that will be used to search for documented artifacts; (d) develop the framework and operationalize the components; (e) evaluate the framework with operationalized components; (f) where necessary, revise the framework based upon tests of the framework; (g) report the results (h) design a way to share the framework and the status of documented artifacts.

Purpose of Study

The purpose of this study was to develop a framework for determining the status of artifacts related to the history of IDT. The results the study allowed for the examination of the status of artifacts and how a framework worked to determine the status of these artifacts. In addition, a way of sharing the status of artifacts and the framework was created. This study employed the following phases: (1) Design and development and (2) Evaluation.

Benefits of Study

The development of a framework to determine the status of artifacts can help disciplines such as IDT better understand the status of their artifacts and take steps to organize and preserve these artifacts. Because histories are valuable to disciplines, it is important to keep track of histories and the artifacts used to create them. The goal of this study was to explore new ways to organize and preserve artifacts.

Research Questions

Based on a review of the literature the following questions were examined:

1. What literature-based components could be used in the design of a framework to determine the status of artifacts related to the history of IDT?
2. How can the framework be designed so that it can determine the status of artifacts related to the history of IDT?
3. What literature-based components could be used to design a database in order to share information about the status of artifacts?

Research Design: Design and Development Research

Richey and Klein (2007) define design and development research as the, “systematic study of the design, development and evaluation process with the aim of establishing an empirical basis for the creation of instructional and non-instructional products” (p.xv). Hasan (2003) refers to design and development research as, “the disciplined investigation conducted in the context of the development of a product or program for the purpose of improving either the thing being developed or the developer (p.7).” One of the critical aspects of these definitions is that design and development research is not about performance but is more closely linked to a design process where an instructional or non-instructional problem is studied.

Beginning developmental research with a clear problem is recognized as the first step in the research process. Richey and Klein (2007) describe how problems for IDT practitioners can come from several areas including: emerging technologies, workplace problems, technology problems, and representative theory problems. In addition, Richey and Klein (2007) address the importance of the problem being timely and interesting to people in the field.

It can be argued that the problem addressed in this study is both timely and interesting to the field. First, there has been recent activity showing interest in capturing IDT’s past. The AECT History Makers Project, for example, provides a way to preserve and share the verbal histories of past leaders. In addition, there does not appear to have been an attempt to determine the status of artifacts related to the history of IDT.

Richey and Klein (2007) state that tool research, “involves situations in which the design and development process used in a particular situation is described, analyzed and a final product is evaluated” (p.9). The emphasis in product and tool research is on the, “study of specific product or tool design and development projects” (p.13). Outcomes of design and development

research on tools include lessons learned while developing products and analyzing the conditions in which they are used. In this study a tool was developed and evaluated.

Reiser (In Richey & Klein, 2007) points out that non-instructional interventions can be part of design and development as well. Nguyen (2005) describes a performance support system and argues that, “practitioners should look for more innovative solutions to provide performers with on-the-job support” (p.37). Job aids take a variety of forms and delivery methods, but the purpose of these aids is to serve to keep job-related information external to the worker (Elliott, 1999). Job aids can be used when the tasks they support are complex, dynamic, involve highly critical criteria, and readily allow for their use (Elliott, 1999).

The tools developed for this study (the framework, the printable guide, and the website) were thought of as job aids during the design process because the framework, and its physical forms, are tools that can help people accomplish the task of determining the status of documented artifacts.

Questions, rather than hypotheses, are often central to organizing design and development studies (Richey & Klein 2005). The tool design and development, like much instructional design, was a problem solving activity driven by goals and questions. Some of these questions included: How will these components be selected? What criteria will be used? How will they be organized into a framework to help in the determination of status? What form would a framework take in order to determine status? What would the framework look like? And how can the framework be tested?

Procedures for Phase One: Design and Development

Selection Criteria

The literature review provided potential components to select and use for the framework. Because the approach to the design of the framework attempted to be practical and simple, components were selected on the basis that they would help accomplish the goals of the framework; namely, being able to determine artifact status. In addition to practical concerns, components were only selected from domains that had a proven body of work. The historic method has been used for over two hundred years as a tool for examining artifacts and information seeking has been used in the design of search systems.

Testing the Framework

The framework was tested on 69 artifacts sampled from Saettler (1953), Iverson (1953), and Lembo (1970). These dissertations were selected because they provided a large set of documented artifacts, citations, from which to sample. The samples were seen to be in the range of what could be considered to be historic, many published prior to 1950.

Two methods of data gathering were used in the study. Searches for each of the 69 artifacts were documented using an online form that was designed to track steps in the framework (See Appendix A). Three sets of tests were performed. The first test involved 23 artifacts and the second involved 46 artifacts. In the first set of tests, a documented artifact from each of the 23 categories was searched for so that all the categories shared by each author were searched at least once. The categories were chosen by how each author had organized their references according to type of document. A second test was performed on 46 sampled artifacts, also sampled from each category and each author. A third test was performed on nine artifacts that could not be found during the first two searches. All 69 searches were documented using a work log. The maximum number of searches was set at four searches per documented artifact in an effort to put boundaries on the amount of time spent on the searches.

The online form tracked other characteristics as well. One such characteristic involved the use of *contained* or *not contained* spaces. To clarify, when a searcher searched a university library website they were searching content that was contained in that library, e.g., books, journals, and maps. Often a library owned this material. Also, when a searcher searched JSTOR, they were searching contained content, content that was owned or available only through JSTOR. Non-contained content was content searched for by a search tool that was not physically

contained within that search tool's database, or digital or physical repository. Google was a non-contained search tool because the content searched by google was not contained within its database, but was an index of websites it provides access to.

Limits on the access to websites were tracked by the form to explore what limits artifacts have in relation to searchers. This was added to examine if website locations required identification or password to use certain search tools and access their content. Also, some artifacts may exist at only one location and some may exist only in digital format.

Capturing the complexity of searches using an online form seemed difficult, mainly because searching was not always a simple activity. In an attempt to capture these complexities, a section of the form was created titled *other actions*. This part of the form documented if the searcher followed links in the original search results, if documents had been searched for leads, or if the search was complex, i.e., required stepping out of the framework.

The form also contained a location for status, i.e., the location of an artifact. After the first 23 searches the amount of time taken for each search also was added to the form.

Sampling

There were a total of 23 categories of references used by the three authors. Some of these categories were shared. Books and newspapers, for example, were used by each of the authors. Others categories were referred to differently by the authors, Iverson referred to dissertations as *manuscripts* while Lembo referred to them as *dissertations*. Once the 23 categories were organized into groups that were shared between the authors, there was a total of 13 categories of references. These categories became an important organizing feature of the framework (See

Appendix B). Simple random sampling was used to collect citations found in Saettler (1953), Iverson (1953), and Lembo (1970). In order to obtain a random sample from each category and each author, three citations were randomly selected from each of the original 23 categories for a total of 69 samples. This meant that every category from each of the three authors was tested three times.

Structured work logs can be used to create reliable and comparable data (Richey & Klein, 2005). All 69 searches were tracked and observations and lessons learned were documented as each search occurred using a work log.

Data Analysis Techniques

Data from the online form was examined using multiple descriptive statistical techniques. These techniques included comparisons of search queries and tools to determine which approaches were better able to locate artifacts and to determine if contained or non-contained spaces were more successful at locating resources, locations of artifacts, and category types of located and non-located artifacts. The work logs were examined using open and closed coding. Open coding was used to look for the frequency of word and idea occurrences in the work log and closed coding was used to directly relate observations found in the work log with framework components.

Summary

The components used in the design of the framework were borrowed from the historic method, information seeking, and histories of IDT. These components were selected because the activities they address have qualities that paralleled the requirements of the framework. Once the

framework was operationalized it was put through a series of 69 tests. Data was gathered using an online form and a work log. After testing, data was gathered and analyzed. After testing a way to share the framework was designed using lessons learned from testing and message design principles.

Chapter 4: Results

Introduction

Design and development research begins with the identification of a problem (Richey & Klein, 2005). The problem addressed by this study involved the creation of a framework to determine the status of artifacts related to the history of IDT. Status, in this case, refers to the existence and location of a documented artifact. The design of this framework can help the field of IDT develop a clearer understanding of the status of its artifacts and how these artifacts might be found.

Results of the Literature Review and Analysis

Framework Design and Development

According to Clifton (2003), a framework is a real or conceptual structure intended to serve as a support or guide for building something useful. Clifton points out that a framework ties together discrete objects and components into something more useful. This was a guiding piece of logic in the initial development of the framework: That the key focus of the study was putting components together for their eventual use in the framework and designing a way to share these results.

Before any components could be brought together, there needed to be some way of understanding and deciding what those components were and how they might fit together as a functioning framework; otherwise they were simply a list of components. To begin to conceptualize what form this framework might take, it seemed valuable to examine the components and processes found in the literature review in relation to the main research

questions, and to consider that what was being built had to function, be understandable, and accomplish goals. Design during this phase was seen as a balance between questions, goals, and available components.

The initial consideration in the design of the framework dealt with the general nature of searches. This study was essentially about looking for things and there are fundamental elements of any search. Searches require a searcher, appropriate tools, search processes, and relevant information regarding the object of the search.

It also seemed apparent that the processes involved in determining the status of documented artifacts were likely to occur in stages. In other words, the search process can be seen within the context of a time-based process. It was thought that this process had three separate stages: pre-search, search, and post-search. Each of these stages would involve specific functions in the framework. For example, during pre-search the searcher would acquire a list of documented artifacts, i.e., citations to search for. During search, the searcher would search for the listed artifacts. During post-search, the results of the searches for the artifacts would be organized and presented for use by others. Pre-search, search, and post-search also provided the framework with a linear organizational structure.

In order to bring the various search elements, processes, and stages together, an approach was needed to make sense of the overall combination of participants, resources, processes, and results. In this study a basic version of system thinking was employed in order to provide the framework with a more organized and functional purpose. According to Hayajneh (2007) a, “system is a collection of independent but interrelated components organized in a meaningful way to accomplish an overall goal” (p.1). The function of any system is to convert inputs,

information or materials, into a product to be used within the system, or outside of the system or both (Hayajneh). As a system, the framework becomes an organization of components, i.e., inputs, processes, and outputs, organized to accomplish a goal. Each of the three search stages required inputs, processes and outputs for the framework to function properly.

Table 1.

Early Organizing Framework for Artifact Search Tool

Search Stages	Basic Search Elements	Systems Thinking Components		
		Inputs	Processes	Outputs
Pre-search	Searcher Tools Information			
Search	Searcher Tools Information			
Post-search	Searcher Tools Information			

Table 1 presents the components of a version of an organizing framework for an artifact search tool developed in this study. Brief descriptions of each of the parts of this early framework are presented in the following paragraphs.

During pre-search the searcher uses tools and information to locate and organize references to documented artifacts. During the search stage the searcher uses tools and information to search for the documented artifacts identified in the references. In the final stage, post-search, the searcher organizes the results of the searches he has performed.

Searcher. A searcher is a necessary component within the framework because without a searcher, of some kind, it would be impossible to interact with the documented artifacts or tools. Information seeking theorists made searchers central to their models and IDT historians sought out artifacts they would later use in the construction of their histories. The historic method depends on a person to decide on the goals of their method and to selectively identify relevant material from information sources. In each of the areas of the literature review a searcher is required to process information, use available tools, make decisions, and organize the outputs of their system.

Searching does not always require a lone searcher and some searches can involve more than one person, such as a community web-blog that may be used to search for an artifact. Searching might also be done by technologies, such as software designed to search for artifact citations across the Internet.

Tools. Tools are the physical components used to reach the goal of determining the status of documented artifacts. The tools selected for the framework were selected for practical reasons. Tools already exist to help researchers search for citations, books, articles, dissertations, and journal articles. These tools were added to the framework and include: search tools, digital databases, forums, blogs, email, and other potential technologies that can assist in reaching the goal. Non-Internet based tools such as books, conversations, telephones or other tools can also be used to accomplish the goal of the framework.

Information. For the purpose of this study information was understood as that which informs. Without information, the searchers and tools have nothing to process. Searchers require some information about a documented artifact to begin to search for that artifact.

Inputs. Inputs of the framework included searcher, tools, and information. A searcher is required to interact with tools and information, information in the form of documented artifacts is required to have something to search for, and the tools are needed to help reach the goal of determining status.

Processes. The processes of each stage are determined by how the searcher interacts with the tools and information at that stage of the search. Processes for each stage focus on the specific activities of that stage. These actions will be discussed in detail below.

Outputs. The outputs of each stage are the results of the processes of each stage and also provide the information required for the next stage. For example, during pre-search the results of the process are organized citations to be brought into the search stage as information and searched. The output of the search stage, information in the form of the status of an artifact, is entered into the post-search stage of the framework.

As shown in Table 2 many items included in the initial framework were derived from a basic awareness of what, in general, is involved in searches and the organization of processes. However, early versions of the framework (see Appendix C) that were based on this general awareness were overly generalized and not specific enough to function well as an actual usable tool. Instead, they reflected processes that were too generic to provide the guidance necessary to capitalize on the recommendations of researchers with expertise in locating artifacts.

Searching for documented artifacts involves specific processes. Unfortunately, processes identified in much of the reviewed literature were seen as not having specific directions. For example, Hopkins (1976) and Brickman (1973) use *the accumulation of sources* in their versions of the historic method with very little development or explanation of this process. Despite these

difficulties, there were descriptions of processes from three literature review areas that proved to be useful. Information regarding these processes was derived initially from the literature review and then adapted for use in searching for documented artifacts. Specific information gleaned from the literature review that was used in designing and developing the framework involved the procedures found in information seeking, steps found in the historic method, and the documented artifacts found in the histories of IDT.

Table 2

Systems Thinking Components Applied to IDT Artifacts

	Systems Thinking Components When Applied to Searches for IDT Artifacts		
Search Stages	Inputs	Processes	Outputs
Pre-search	Searcher Tools Information	Identify a problem related to IDT artifacts	Identification of types of IDT artifacts to be searched
	Searcher Tools Information	Identify and locate primary sources of documented IDT artifacts	Sources of citations for IDT artifacts
	Searcher Tools Information	Organize	Organized list of citations
Search	Searcher Tools Information	Formulate	Search query
	Searcher Tools Information	Select	Search tool
	Searcher Tools Information	Filter	Potential location of documented artifact
	Searcher Tools Information	Verify	Reliability of location
	Searcher Tools Information	Extract	Organized citation and status (Location or no location)
Post-search	Searcher Tools Information	Share	Shared information

Putting the Components Together

Pre-Search Stage

Inputs. The searcher at the pre-search stage could be a single person, a group of people, or software designed to search for sources of documented artifacts. Tools at the pre-search stage help searchers find sources for documented artifacts and are the sources for these documented artifacts. Tools to help find sources are the Internet, books, conversations, archives, or telephones; essentially, any tool that would allow a searcher to find sources for documented artifacts. For example, the Internet was used to locate and request Saettler's (1953) dissertation from The University of Southern California. The sources for documented artifacts include: dissertations related to the history of IDT, historical articles, websites, conversations, and any source that may contain documented artifacts.

Processes. There are three essential process that are a part of the pre-search stage: deciding upon a problem, locating sources of documented artifacts, and organizing these documented artifacts by category. *The identification of a problem*, used by Hopkins (1976), is a valuable component to add to the framework because it provides an initial focus for the framework. Identifying a problem spells out the original intent and lets the searcher know what it is they are going to do. This step, also found in information seeking literature, is common in most searching. That is, a searcher needs to know what they are searching before they begin to search for something. Because the framework will search for documented artifacts it is a focused search; it is not browsing or searching for general information on a topic.

Once the problem has been identified, Berg's (2004) stage *identify and locate primary sources* was the second component added because of its relationship to the initial steps and the overall goal of the framework, to look for sources of documented artifacts.

Organizing is the final phase of pre-search. Citations found are organized according to their category. The organizational structure in this study was created by taking the original 23 reference categories used by Saettler (1953), Iverson (1953), and Lembo (1970) and merging them into 13 unique categories based on categories they shared and categories they did not share. How this organization was done can be seen in the figure below:

Organization of Categories

All 23 reference categories used by
Saettler, Iverson, and Lembo

Organized into 13 categories for testing

Books (Saettler) Books (Iverson) Books (Lembo)	Books
Bulletins (Saettler)	Bulletins
Periodical articles (Saettler) Periodical articles (Lembo) Serials and pamphlets (Iverson)	Periodical articles Serials and pamphlets
Publication by organization (Saettler) Publication by organization (Lembo)	Publication by organization
Parts of series (Saettler)	Parts of series
Public documents (Saettler) Government documents (Iverson)	Public documents Government documents
Reports (Saettler)	Reports
Unpublished materials (Saettler) Manuscripts (Iverson) Dissertations (Lembo)	Unpublished materials Manuscripts Dissertations
Newspapers (Saettler) Newspapers (Iverson) Newspapers (Lembo)	Newspapers
Minutes (Lembo)	Minutes
Categories and directories (Lembo)	Categories and directories
Unpublished materials (Lembo)	Unpublished materials
Periodicals (Lembo)	Periodicals

Figure 1: 23 Categories of references used by Saettler (1953), Iverson (1953), and Lembo (1970) organized into 13 categories for testing and organization. The unpublished materials used by Lembo are actual unpublished materials, while the unpublished materials used by Iverson refer to dissertations. The periodicals used by Lembo refer to single issues of periodicals and not specific articles, while periodical articles refer to specific articles.

The citations are then organized in a digital file. Excel, Word, or Notepad can be used for this purpose. For this study I used Notepad to store and organize the sampled collection of documented artifacts after the pre-search was complete. Notepad was used because when

copying and pasting into search tools, it does not add the coding and styling information that sits in the background of Microsoft Word.

Outputs. In this study, information, in the form of organized citations, is the output for the pre-search stage of the framework. Citations for each of the documented artifacts are stored and organized according to category and include information such as author, title, date, publisher, organization, location, category of reference, and authors who had used the citation. Outputs can range from large files with many citations to files with a single citation (See Appendix D).

Search Stage

The extracted references to documented artifacts from the pre-search stage are input as information into the search stage. During the search stage, citations are searched for using tools and strategies.

Searcher. The potential characteristics of the searcher include one searcher, many searchers, or electronic searches performed by specially designed software. Many searchers could include librarians assisting with the search, a web forum with users helping with the search, or an email sent to an individual asking for assistance.

Tools. Many resources exist for searchers to use to find information about citations. Potential tools used in the search stage are Internet and non-Internet tools. Internet tools include search engines such as Google, university libraries, email, and other online search tools discussed below. Non-Internet tools that can be used during the search stage include telephone conversations, printed listings of archival holdings, books that provide locations of references, and other possible sources.

Information. Information required for inputs during the search stage is the extracted citations from pre-search and their category type. The information contained in these citations is used to search for the artifacts.

Processes. Several information seeking components were added to the processes phase of the search stage. Searching for the status of documented artifacts related to the history of IDT can be seen as an information seeking process because it parallels the requirements of the framework. Specific components of information seeking models created by Marchionini (1995),

Ellis (1989), and Kuhlthau (1993) describe activities people employ when they seek information (See Appendix E). In information seeking there is a need or requirement, much like the need or requirement to determine the status of artifacts. There is also the selection of sources to address a need, tools such as Internet search engines.

Besides the models of Marchionini (1995), Ellis (1989), and Kuhlthau (1993), Bates (1989) describes searching for information as an interactive and iterative process that accounts for changes in a user's information needs as new insights are gained from information encountered while seeking information. Bates refers to this process as *berrypicking*.

Information seekers also use specific tactics when searching. These tactics include: information structure tactics, a technique for moving through information or links to find sources or information; query reformulation tactics, which include narrowing a query by providing more specific terms; and monitoring tactics, which refer to ways information seekers keep track of their searches (Hearst, 2009). The five processes identified for the framework during the search stage were: *formulate, select, filter, verify, and, extraction*. These phases were selected because they parallel how a search for a documented artifact might occur.

Formulate. The formulation of a query is described by Marchionini (1995) and Hearst (2009). Marchionini describes this as matching the task with the system. Hearst discusses formulating and reformulating the specific terms used in the query. Hearst's approach explains how users take information and create a search query. During the formulate stage, a citation is treated to a search term strategy; that is, parts of the citation are used in a search. An example citation may look like this:

Miles, John R. and Charles R. Spain, Audio-Visual Aids in the Armed Services.

Washington D.C.: American Council on Education, 1947. 96 pp.

In this example the parts of the citation include: two authors (Miles, John R. and Charles R. Spain), title (Audio-Visual Aids in the Armed Services), publisher (American Council on Education), location (Washington DC), date (1947) and number of pages (96).

During the formulation process *author, title, and date* were used as the initial query phrase. This query phrase was selected so that search tools would search for the specific citation. If the initial search was unsuccessful, additional search strategies were attempted. Other possible search queries were: *author, title, date; author, year; title, year, and other*. A part of the framework added after testing was that punctuation should be removed from the source citation to improve search.

Select. The term *select* comes from Marchionini (1995) who described this as an activity where the user chooses the search system that will most likely solve their problem. After a search query has been formulated the searcher selects a search tool that is most likely to provide the results they require. For example, books can be found in WorldCat and newspapers can be found in university library websites. Minutes from the history of IDT can be found in the Guide to Archives of the AECT. The framework provides the searcher with the most likely search tool to find their artifacts. Each category has a list of search tools to select from. The first tool listed in the framework is the first suggested tool to attempt, followed by the next search tool if the previous tool does not work. If the category of citation is *book*, the searcher is requested to first search WorldCat, then Google, and then a university library (See Appendix F).

WorldCat and Google are critical to the framework because their databases have indexed large portions of the Internet. WorldCat is the largest union catalogue in the world and contains over 200 million records and Google has indexed almost 45 billion pages on the Internet (Chen, 2012). Both have reputations for being powerful search tools.

The AECT Archive was selected as the location to search for minutes because of its extensive holding of materials related to the history of AECT, a professional organization. University libraries were selected as search tools because of their reliability and the perceived likelihood that they would contain certain documented artifacts, such as copies of newspapers which are published in close proximity the university. The Internet Archive was chosen initially as a search tools because it contains 4.4 million eBooks (2015). Government archives were selected as search tools because the archives provide information about the location of documented government artifacts. ProQuest was selected because it contains dissertations.

Filter. After formulating a query and selecting a search tool the searcher then filters through their results to determine if any results are valuable to their search. During the filter phase, results of the search are examined in order to determine if any of the search results are related to the desired characteristics of the documented artifacts being searched. This task requires the user to look for information found in the original citation within the search results. If results are not found, the user is directed to return to the formulate or select phase.

Verify. If a documented artifact is located in the search results, the next step in the process stage is to verify the information found in the filtering stage and determine if the information found is reliable. Reliability is determined by the reputation of the website. If a website has a known reputation as a professional organization, it is seen as a reliable source.

Reliable sources include: university libraries, government archives, digital databases such as JSTOR, the AECT Archive, newspaper archives, and other sources whose reliability can be determined. Ellis (1989) uses the term verify for checking the accuracy of sources.

An example of how reliability was added to the framework is this: If WorldCat were used for a search, the user was required to visit a library listed in WorldCat's search results to assure that the artifact was listed in that library's holdings. WorldCat listings are not always reliable but university library listings were viewed as reliable sources.

Extract. During the extraction phase information about the specific location of the artifact is extracted. Marchionini (1993), describes extracting as the process when the searcher copies and stores information. One of the important pieces of information required to determine status is the classification number of the artifact or some identifier of its location. This number will tell the searcher where the artifact is located within libraries, archives, or other locations. Each of the categories of artifacts can have unique call numbers (See Appendix G).

Post-Search Stage

The post-search phase requires a citation, its category type, and its status as information. Although technically not part of the post-search stage, in this study the post-search stage included adding the extracted information to a shared space. This shared space will be the focus of a later section in this chapter.

Testing

The framework was tested by searching for 69 documented artifacts extracted from Saettler (1953), Iverson (1953), and Lembo (1970). At the conclusion of these 69 tests, 60

documented artifacts were found and nine documented artifacts were not found. The nine artifacts not found were then searched for using methods that previously had not been used in the study and three of the nine were found using methods not included in the framework. Actions performed during the search for artifacts were documented using an online form to capture search processes which paralleled the framework. Each test was set at a limit of four possible unique searches to provide the testing with a time limit. In addition, a work log was used to capture observations and lessons learned about the search process.

Test One

Twenty-three artifacts were searched for during the first test of the framework. By the end of this search the status of three artifacts could not be determined. Of the three that were not found during the first test, two were unpublished, two were undated, one was a mimeographed sheet, and one had no author. Three of the first 23 searches were considered complex searches, i.e., searches that required actions outside the scope of the framework. No changes were made to the framework during this initial testing because it was thought that 23 tests were not enough of a sample to change the initial design.

Changes were, however, made to the tracking form. The following variables were not tracked after the first test: the number of searchers during pre-search, which would always be one in this study, the tools used during pre-search, which would always be dissertations in this study, the outputs during pre-search, which were always citations, and the number of searchers during the search stage, which would also only be one during this study. These variables could change in other testing environments that used multiple sources and multiple searchers.

Tests One and Two

Three separate tests were conducted in this study. The first test involved searches for 23 citations, one from each of the 23 categories used by Saettler (1953), Iverson (1953), and Lembo (1970) to organize their references. For the second test, it was thought that if an additional 46 searches were performed, this would provide enough data to explore and provide information about how the framework functions in determining the status of artifacts. The second test involved searches for 46 citations, two from each of the 23 categories. The third and final test involved searches of the nine citations that were not located during the first two tests. The following section is a discussion of the results from all 78 searches.

Data about status. Following the 69 searches in Tests One and Two, nine artifacts could not be located. The artifacts that could not be found came from seven of the 13 consolidated categories. In six of the 13 consolidated categories all artifacts were found. Table 3 shows the number of artifacts located and not located by consolidated category.

Table 3

Artifacts Found and Not Found and Corresponding Category

Category	Number of artifacts not located	Number of artifacts located
Periodical articles, serials and pamphlets	2	7
Unpublished materials	2	1
Public documents, government documents	1	5
Catalogs and Directories	1	2
Publication by organization	1	5
Minutes	1	2
Unpublished materials, manuscripts, dissertations	1	8
Books	0	9
Bulletins	0	3
Newspapers	0	9
Parts of Series	0	3
Reports	0	3
Periodicals	0	3

Note: Saettler and Lembo referred to journal and magazine articles as *periodical articles*, while Iverson referred to them as *serials and pamphlets*. Saettler also referred to dissertations as *unpublished material*, while Lembo referred to completely unpublished works as *unpublished material*. That is why different categories share category names.

After the third test involving nine citations, six citations could not be found. Of these six, three were unpublished. The remaining three belonged to the following categories: catalogues

and directories, public and government documents, and periodical articles, serials and pamphlets.

Table 4 displays the locations of the artifacts and their corresponding categories.

Table 4

Location of Documented Artifacts and Corresponding Category

Category	University Library	Archive	Public library	Digital	Not Found
Books	9				
Bulletins	2			1	
Catalogs and directories	1		1		1
Minutes		2			1
Newspapers	9				
Parts of Series	1	1	1		
Periodical articles, serials and pamphlets	4			3	2
Public documents, government documents	3	1		1	1
Publication by organization	1	2		2	1
Reports		1		2	
Unpublished materials		1			2
Unpublished materials, manuscripts, dissertations	7			1	1
Periodicals	1			2	
Total	38	8	2	12	9

A total of 12 of the found artifacts were digital files. As Table 5 shows, these digital files were located in several different locations including the Internet Archive, Google Books, JSTOR, Eric, ProQuest, and three websites.

Table 5

Location of Digital Files

Where digital file located	Category
Internet Archive	Periodical articles ,serials and pamphlets (2) Periodicals Publication by organization
Google books	Periodical articles ,serials and pamphlets Reports Report
JSTOR	Bulletins
Motion Picture Association of America website	Public documents , government documents
Early Radio History website	Publications by organization
Lantern: Media History Digital Library	Periodicals
Eric	Publication by Organization
ProQuest	Unpublished materials , manuscripts, dissertations

The average publish year of the sampled documented artifacts was 1940 and the average publish year of the documented artifacts not found was 1951; two were from the 1960s and two had no date.

Data about the function of the framework. Each citation included in Test 1 and Test 2 was subjected to as many as four iterations. No single search tool or single formula was able to locate all citations. For example, during the first iterations of the four search iterations, *author, title, and year* was deemed to be the most appropriate search query formula and was used 30 times. It was the most common formula used throughout testing. During the first iteration, this query formula in combination with the search tools of WorldCat, Google, or university libraries found results 22 times. Five times the formula *author, title, and year* was used with Google and failed to find results. Of these five, one was never found, one ended up being a complex search and necessitated leaving the framework, one was found in WorldCat, and two were found in Google by altering the query formula.

WorldCat was searched 25 times using several search formulate during the first iterations of testing in Tests 1 and 2. For example, it was used with the formula *title and year* eight times; six of these times failed to find results. Two of these failures were reports, three were public documents, and one was a catalogue or directory. Although none of the six failures were found on the initial search using World Cat, four of those six were later found using Google. At the conclusion of the first iterations of Tests 1 and 2, the status of 44 documented artifacts was determined and the status of 25 artifacts remained unknown.

During the second search iterations, each of the four times *author, title, and year* were combined with Google resulted in no results. However, Google was used eventually to find two of these four citations using a simpler query formula. The Internet Archive was searched four times in the second iterations with no results. Three of the four artifacts searched for using the Internet Archive tool were never found, even after searching outside the framework for the final

nine artifacts. At the conclusion of the second iterations, the status of eight additional documented artifacts was determined and the status of 17 artifacts remained unknown.

During the third search iterations the Internet Archive was searched three times with no success. Each of these artifacts were eventually found using Google and a simplified query formula. The only results found during the third iteration of searching were found using a *title* and *year* query of WorldCat. At the conclusion of the third iterations, the status of one additional documented artifact was determined and the status of 16 artifacts remained unknown.

During the fourth and final search iterations, six of the remaining artifacts were found using Google to search with simplified query formulas, specific records, and adding words from a part of the citation to the search. Also during the final search results were found in government archives. At the conclusion of the fourth iterations, the status of seven additional documented artifacts was determined and the status of nine artifacts remained unknown.

Upon completion of Tests One and Two, nine documented artifacts were not located. Test Three employed measures outside the framework to search for these nine artifacts. Three of the nine artifacts were found in Test Three. Of the final six documented artifacts that could not be found three were unpublished. This number could be four if the undated, mimeographed history of the Keystone View Company is considered unpublished, though it wasn't categorized as such in Saettler's (1953) dissertation. Descriptions of the searches for the final nine artifacts from Test 3 can be found in Appendix H.

Seventeen searches were conducted that were complex, or involved searching for other documents for leads, or required altering the framework; six of the artifacts involved in these 17 searches were never found. Of these six artifacts, three were periodical articles, serials and pamphlets. All categories were represented in the complex category except books and newspapers. Table 7 shows the number of complex searches per category and the located and not located status of artifacts from these categories.

Table 6

Number of Complex Searches Per Category and Number Found and Not Found.

Category	Number of complex searches	Number found/Number of searches
Books	0	9/9
Bulletins	1	3/3
Catalogs and directories	3	2/3
Minutes	1	2/3
Newspapers	0	9/9
Parts of Series	2	3/3
Periodical articles, serials and pamphlets	3	7/9
Public documents, government documents	1	5/6
Publication by organization	3	5/6
Reports	1	3/3
Unpublished materials	2	1/3
Unpublished materials , manuscripts, dissertations	0	8/9
Periodicals	0	3/3

The average length of a time for a search, measured during the final 46 searches, was five minutes 57 seconds. Four tests took over 15 minutes, each of these artifacts were eventually located. Of the searches that took over 10 minutes, the status of three was not determined during the initial two searches. Three searches, two books and one newspaper, took less than two minutes.

Test of the Final Nine

Of the original nine artifacts not found, five were from Lembo (1970), three from Saettler (1953) and one from Iverson (1953). Of the final six artifacts that could not be found three were from Lembo, two from Saettler, and one from Iverson. The final nine artifacts that had not been located were searched for using methods that had not been used in previous tests. These methods included using librarian chat and emailing archivists. Three of the nine were located (See Appendix H).

Turning the Framework into a Sharable Document

The final step in the design process was to bring the framework into the physical world as a sharable document and a system that could be interacted with. Designing a way to share the framework and its results were thought of as extensions of the framework. How can the framework be brought into a sharable space? Two approaches were taken to bring the final framework into a sharable space. The first was that the framework would reside on a website and the second was that a printable copy of the framework would be available for users to follow.

Potential Users

The framework was developed with the ideas of Hill (1979) in mind who stated, “social scientists must learn to use materials that historians have staked out traditionally as their own” (p.4). Ideally these users would be practitioners of IDT with an interest in the field’s history and an interest in preserving this history. These individuals would most likely have experience searching the Internet. They may be incoming students who are interested in, or required to become familiar with, the history of the field.

Design Strategies

Several strategies were used in the creation of the framework. First, its physical form was viewed as a way to parallel what had been theoretically sketched out in the prior sections. The framework, as originally designed, contained elements that seemed to make sense to recreate in its physical form. When designing an interface, as Norman (1988) points out, the design should begin with the right priorities. To begin, it is important to ask what the user hopes to accomplish and how this can be done. Norman also adds that designs should, “follow natural mappings between intentions and the required actions; between actions and the resulting effect; and between the information that is visible and the interpretation of the system state” (p. 188). The dominant features of the framework are pre-search, search, and post-search, these became the key features of the website and printable guide. The search stages, the inputs, processes, and outputs provided a way to structure the content of the sharable documents, the website, and printable guide.

Results from testing were added to the shared documents. These included: adding a university library search prior to newspaper and dissertation searches, adding a *No Results* section to the framework to provide direction when searching requires assistance or looking for clues, being aware of incorrect citations, and adding a specific location call number for verification.

Message design principles were used to make the sharable documents attractive and easy to follow. Gestalt principles such as preattentive processing play a key role in visual perception and in designing visual displays of information (Few, 2006). Graphical interfaces can benefit from the use of Gestalt principles because they follow natural mappings. The printable guide is

large, 11x17, consists of two sides, and is easy to view. One side of the guide, the framework, is represented as a chart that uses common flow chart symbols, arrows, and is organized visually by color code and proximity. The textual side of the guide displays the framework in a top down manner using columns and white space. There is a color mapping between the two sides.

Typographic decisions were also made with consideration given to type size, titles, subtitles, kerning, and leading (See Appendix I).

The website is made of five pages: introductory page, a pre-search page, a search page, a post-search page, and a page to browse and search artifacts whose status has been determined. Norman (1990) stresses making the task the dominant part of the interface and making the tools invisible. For example, Norman points out that design should, “make it easy to determine what actions are possible at any moment” (p. 188). Thus, the website is simple, provides a clear purpose on each page, and easy navigation. Each page has the inputs, processes, and outputs for a specific search stage listed on its page.

The introductory page of the website consists of the title of the site, an explanation of the purpose of the website, contact information, a graphical explanation of the framework, and a link to download the printable guide version of the framework. The pre-search page provides information on where to find sources to documented artifacts, and information on how to organize and store these documented artifacts according to category type.

The search page consists of a single search window with a dropdown menu that allows the user to select the appropriate search tool. The category type and search tools are both displayed in the dropdown menu.

The post-search page provides an interface that allows the user to input the status extracted from the search stage, the location of the documented artifact. In addition to this information the post search page will provide input boxes for title, author, year, publisher, location, and other. Users uploading information about an artifact to the site will also be able to add tags to the information they upload if they have extra information about the contents of the artifact, technologies addressed, theoretical connections, controversies, etc.

The browse-search page allows users to browse and search the status of artifacts that have been loaded into the website's database based on author, title, publication type, year, location, and topic. The post-search page allows users to load their own artifact status information. (See Appendix J).

Summary

A total of 69 documented artifacts were searched for using the framework. Initially, nine of these could not be located. A third search was able to locate three of these. The status of six of these artifacts could not be determined. Most of the artifacts found reside in university libraries and 12 were found in digital format.

Different combinations of search queries were used in conjunction with search tools, these combinations were able to initially locate 60 of the 69 artifacts. WorldCat was never successful at locating Reports and the Internet Archive was never successful at locating an artifact.

Seventeen of the searches were complex and required stepping outside the framework. An example of a complex search would be searching for an archive related to a specific

organization, such as the Federal Communications Commission (FCC) archive, to locate that archive for searching. This was not a part of the initial framework.

A framework for determining the status of documented artifacts was designed using components from the literature in conjunction with systems thinking. This framework was then tested using 69 sampled citations from three IDT historians. Nine of the samples could not be located after initial testing. A final search was done of the remaining nine artifacts and three were found. Of the final six that could not be located, three were unpublished. A further discussion of results can be found in the following chapter.

Chapter 5: Discussion and Conclusions

Introduction

The purpose of this study was to design and develop a framework for use by researchers to determine the status, i.e., the existence and location, of artifacts related to the history of IDT. After an initial, somewhat cursory, investigation of artifacts related to the history of IDT conducted by the researcher, it seemed that the status of these artifacts was unclear and that a more thorough study needed to be done to clarify this status. As part of this more thorough study, components from the historic method, information seeking, and the history of IDT were used in conjunction with systems thinking to create a framework to determine the status of documented artifacts related to the history of IDT. The framework was tested, generally functioned as designed, and was able to determine the status of a large majority of sampled artifacts related to the history of IDT. The design of the framework was then incorporated into the design of a website to share documented artifacts and a guide to display the framework.

Discussion of Results

This study provided initial evidence that a framework to determine the status of documented artifacts can be designed and that many documented artifacts created before 1950 and related to the history of IDT are readily available. Only six of the 69 artifacts searched for could not be found. This finding might appear to conflict with the initial review of artifacts related to IDT conducted by this researcher, which seemed to show that the status of IDT artifacts was unclear. Instead, the preliminary findings and the results of this study differ because they dealt with different factors.

The initial review of artifacts found there were missing archives, mislabeled and unpublished histories, deteriorated materials, artifacts with limited access, minimal information on historic researchers, and artifacts whose status was unclear. The current study focused on the status, i.e., the existence and location, of documented artifacts related to the history of IDT. This study was meant to be a first step toward determining and understanding the status of artifacts related to the history of IDT, how these artifacts can be found, and how they can be shared. A framework was designed and developed to determine the status of documented IDT artifacts, a subset of all IDT artifacts. The framework was applied to a sample of documented artifacts cited by three IDT historians; again, a subset of all documented IDT artifacts and all IDT historians were sampled. The other findings of the initial review of artifacts were not addressed in this study; only the status of a sample of documented IDT artifacts was addressed. The first of two versions of the framework lacked some desirable features and required revisions after testing. There are multiple reasons why the revisions were needed and they are discussed below. However, before discussing the necessary revisions and why they were needed, it is useful to note that, although several revisions needed to be made after testing, all of the original components included in the framework remained and were not replaced by any of the new additions.

Testing of the initial framework demonstrated the importance of verifying the status of a documented artifact. Initially, verification was based upon the assumed professionalism of the website. University websites were seen as reliable, as were the AECT Archive, government archives, and public libraries. During testing, the location of a Columbia Broadcasting System (CBS) FCC meeting in 1951 came into question because a definitive location of the document could not be found. On the government archives website there is a section that seems to locate

the CBS and FCC meeting document in the National Archives at College Park, MD. However, after contacting the National Archives via email (R. Collier, personal communication, March 16, 2015) the location could not be verified. The archivist I communicated with requested more information than the original citation provided. For verification there needs to be a specific location of the documented artifact, in addition to a credible website. The ability to verify the location of a documented artifact came into question twice during testing.

Testing provided an indication of the serendipitous nature of searching. The literature review indicated that sometimes serendipity is encountered in information seeking. For example, occasionally, a searcher will find the citation they are searching for in another list of references. During the final search for Virgil Dickson's work on radio in education, a reference in another article was found that mentioned that Dickson had worked at the University of California Los Angeles. This information was a clue and helped to focus the search on the place where Dickson had worked for a number of years. This documented artifact was never found but finding the city or university where an author worked could be a successful strategy in some cases.

Testing also demonstrated the importance of personal contact when conducting complex searches. The ability to contact librarians or archivists can provide a searcher with more information and expertise than often found using search engines. Library chat, a common technology on library websites, is easy to use and often a librarian can provide search assistance immediately. Library chat and email were used in seven of the final nine searches. Only one of the contacts made via chat and email ended up being successful. However, four of them provided advice about other locations to search for the artifact.

The framework was designed to locate digital or analogue artifacts. After testing, during which twelve digital artifacts were found, this idea seemed to bring up questions. Are digital or analogue files more appropriate for testing? At least part of the goal of the framework is preservation and sharing. Digital files can be distributed around the world quickly and easily. However suitable digital files might be for distribution, they may not be the appropriate choice for preservation because there may not be software that can open them in the future. The framework was adjusted to search for an analogue version of each digital file located.

WorldCat, even when it was not selected as a search tool, played a role in the discovery of artifacts. Several times search queries using Google led to results in WorldCat. Initially, WorldCat was used in the search because of its reputation as a powerful search tool but it found results outside of its originally perceived scope. Although WorldCat failed to locate any items from the reports category and was removed from the reports category, it was added as an earlier search possibility to other search tool selection phases.

The experience gained from testing demonstrated that, in some situations, it is necessary to build upon prior searches. These are added to newspaper and dissertation searches when searchers are required to initially search for a university before searching their website for a dissertation written at that school. For example, if a searcher needed to search the University of Miami library for a dissertation, they would need to initially search for the University of Miami library. Prior searches were added to the formulate and select phases of the search stage.

Testing confirmed that it is impossible to know if a citation is incomplete or incorrect before a search begins. The following citation in Iverson (1953) was found to be incorrect:

United Press Dispatch, Madison State Journal, Madison, Wisconsin, January 18, 1953. There

appears to have never been a Madison State Journal. I contacted the University of Wisconsin Library and this was confirmed (Librarian, personal communication, February 28, 2015).

Changes cannot be made to the framework to ensure that a citation is correct and complete.

However, what can be done is to note in the framework that citations are sometimes incomplete or incorrect and to be aware of this. There were a total of five incomplete or incorrect citations encountered during testing.

Testing also demonstrated that what might seem like a good idea is not always the case. During the second and fourth search iterations, simplified search queries were formulated ten times in searches. This initially seemed to provide some evidence that search queries should be simplified earlier in the process. But simplified searches failed to locate documented artifacts 12 times during these phases. So, changes were not made to the framework.

Finally, testing also revealed that some search sites duplicated the results of other sites without adding any additional information. For example, the Internet Archive was used as an initial search tool seven times during testing without locating an artifact. However, there were instances when Google was used as an initial search tool and returned results stating artifacts were located in the Internet Archive. The Internet Archive was removed from the present framework as a search tool but could have value as a search tool in the future as more artifacts are stored in digital format.

Next Steps

What does this study mean for searches of past, present, and future documented artifacts? At least in one sense it means that our artifacts have been well maintained, that in the past there have been systems in place and concerned archivists have seen to it that artifacts are preserved

and retrievable. However, there were a few artifacts that were not located and if the framework is used extensively, we almost certainly will encounter more documented artifacts that cannot be located. Further use of the tool could help to determine what artifacts are most likely to be lost and could alert current archivists who have a responsibility to preserve and maintain archives to potential problem areas.

One area that should be of interest to current archivists is digital preservation. Vinton Cerf (Sample, 2015) maintains that the 21st century will be a lost century in terms of digital artifacts and that many of the things we produce in this century will be lost. If Vinton Cerf's warnings are taken seriously then a bibliometric analysis could be performed on the citations used in recent IDT research studies. This analysis could help determine the extent to which digital files are being cited and to determine current issues, as well as anticipate future issues, with locating, retrieving, and displaying cited files.

Archives constantly grow and change. But as long as artifacts are collected, ordered, and preserved, human activity can be organized and recorded. The framework does not help us collect or preserve artifacts, but it can help organize and understand their status. Hill (1979) stated, "In order to recover our own disciplinary history and advance our intellectual understanding of past events, social scientists must learn to use materials that historians have staked out traditionally as their own" (p.4). If a tool such as the framework is implemented and employed by practitioners, it might benefit the field as a tool to organize what we know about the artifacts that make up our past. In this way, we can use materials that historians traditionally employed and advance our understanding of artifacts that make up our past.

References

- AECT In the 20th Century: A Brief History. (2015). Retrieved from
http://aect.siteym.com/?aect_in_the_20th_cen
- Clifton, M. (2003). What is a Framework? Retrieved from
<http://www.codeproject.com/KB/architecture/WhatIsAFramework.aspx>
- Bagrow, L. (1964). *History of cartography*. Edison, NJ: Transaction Publishers.
- Bates, M. (1989). The design of browsing and berrypicking techniques for the online search interface. *Online Review*, *13*(5), 407-424.
- Berg, B. L. (2004). *Qualitative research methods for the social sciences*. (Vol. 5). Boston, MA: Pearson.
- Blandford, A., & Attfield, S. (2010). Interacting with information. *Synthesis Lectures on Human-Centered Informatics*, *3*(1), 1-99.
- Bloch, M. (1953). *The historian's craft*. Manchester , UK: Manchester University Press.
- Brickman, W.W. (1973). *Research in educational history*. Norwood, PA: Norwood Edition.
- Bryant, A., Black, A., Land, F., & Porra, J. (2013). Information systems history: What is history? what is is history? what is history? ... and why even bother with history? *Journal of Information Technology*, *28* (1). pp. 1-17.
- Butler, R. P., & Rabak-Wagener, J. (2003). *The Lee and Lida Cochran AECT Archives: Who, When, Where, Why, and How?* Annual Proceedings-Anaheim: Volume# 61.
- Carr, E. H. (1961). *What is history?* New York, NY: Random House.
- Chen, X. (2012). Google Books and WorldCat: a comparison of their content. *Online Information Review*, *36*(4), 507-516.

- Chen, X. (2012). Google Books and WorldCat: a comparison of their content. *Online Information Review*, 36(4), 507-516.
- Cheng, E. K. M. (2008). Exceptional history? The origins of historiography in the United States. *History and Theory*, 47(2), 200-228.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.
- D'Andrade, R. G. (1995). *The development of cognitive anthropology*. Cambridge, UK: Cambridge University Press.
- Dervin, B. (1983). *An overview of sense-making research: concepts, methods and results to date*. Paper presented at the International Communications Association Annual Meeting, Dallas, May, 1983.
- Dervin, B., & Nilan, M. (1986). Information needs and uses. *Annual Review of Information Science and Technology*, (21)3-33.
- De Vaney, A., & Butler, R. P. (1996). Voices of the founders: Early discourses in educational technology. *Handbook of research for educational communications and technology*, 3-45.
- Donnelly, M., & Norton, C. (2011). *Doing history*. Oxford, UK: Routledge.
- Dorris, A. V. (1928). *Visual instruction in the public schools*. Boston, MA: Ginn & Company.
- Edelson, D. C. (2002). Design research: What we learn when we engage in design. *The Journal of the Learning sciences*, 11(1), 105-121.
- Elliott, P. H. (1999). *Job aids. Handbook of human performance technology* (2nd ed.). In H. Stolovich & E. Keeps (Eds.), (pp. 430-441). San Francisco, CA: Jossey-Bass Pfeiffer.

- Ellis, D. (1989). A behavioral approach to information retrieval system design. *Journal of Documentation*, 45(3), 171-212.
- Ellis, D., Cox, D., & Hall, K. (1993). A comparison of the information seeking patterns of researchers in the physical and social sciences. *Journal of documentation*, 49(4), 356-369.
- Ellis, D., & Haugan, M. (1997). Modelling the information seeking patterns of engineers and research scientists in an industrial environment. *Journal of Documentation*, 53(4), 384-403.
- Ellis, D., & Oldman, H. (2005). The English literature researcher in the age of the Internet. *Journal of Information Science*, 31(1), 29-36.
- Elsheimer, S. & Pifer, K. (2012). Everything old is new again: Or, why I collect educational equipment. *Journal of the Society of Motion Picture & Television Engineers*, 73(7), 576-579.
- Erlhoff, M. & Marshall, T. (2008). *Design dictionary: Perspectives on design terminology*. New York, NY: Birkhäuser Architecture.
- Eskildsen, K. R. (2008). Leopold Ranke's archival turn: Location and evidence in modern historiography. *Modern Intellectual History*, 5(03), 425-453.
- Few, S. (2006). *Information dashboard design: The effective visual communication of data*. Sebastopol, CA: O'Reilly Media.
- Gaddis, J. L. (2002). *The landscape of history: How historians map the past*. New York, NY: Oxford University Press.
- Gagliardi, P. (1992). *Symbols and artifacts: View from the corporate landscape*. New York, NY: Aldine de Gruyter.

- Green, A., & Troup, K. (1999). *The houses of history: A critical reader in twentieth-century history and theory*. Manchester, UK: Manchester University Press.
- Hagan, S. M. (2007). The Imagined and The Concrete: What is an Artifact? *Artifact*, 1(1), 23-25.
- Hasan, H. (2003). Information systems development as a research method. *Australasian Journal of Information Systems*, 11(1), 4-12.
- Hayajneh, Y. (2007). Systems theory. Retrieved from <http://www.hayajneh.org/1/?p=555>
- Hearst, M. (2009). *Search user interfaces*. Cambridge, MA: Cambridge University Press.
- Hill, M. R. (1993). *Archival strategies and techniques*. London, UK: Sage.
- Hopkins, C. D. (1976). *Educational research: A structure for inquiry*. Columbus, OH: CE Merrill.
- Howell, M. C., & Prevenier, W. (2001). *From reliable sources: An introduction to historical methods*. Ithaca, NY: Cornell University Press.
- InfoComm International 70th Anniversary Video (2014). Retrieved from <http://vimeo.com/5522841>
- Internet Archive Now Hosts 4.4 Million eBooks, Sees 15 Million eBooks Downloaded Each Month (2015). Retrieved from <http://the-digital-reader.com/2013/07/09/internet-archive-now-hosts-4-4-million-ebooks-sees-15-million-ebooks-downloaded-each-month/>
- Iverson, M. (1953). *Survey of A-V techniques in education 1900-1950* (Doctoral Dissertation).
- Kehr, D. (2010, October 15). Film riches, cleaned up for posterity. *The New York Times*. Retrieved from http://www.nytimes.com/2010/10/15/movies/15restore.html?_r=0

- Klainberg, M. (2010). An historical overview of nursing. *Today's Nursing Leader: Managing, Succeeding, Excelling*, 21.
- Klein, G., Moon, B. M., & Hoffman, R. R. (2006). Making sense of sensemaking 1: Alternative perspectives. *IEEE intelligent systems*, 21(4), 70-73.
- Kruse, W.F. (1957). Archives request that came too late. *Educational Screen and AV Guide*, 36(6), 176.
- Kruse, W.F. (1964). Willard Beach Cook — Pioneer distributor of narrow-gage safety films and equipment. *Journal of the Society of Motion Picture & Television Engineers*, 73 (7), 576-579.
- Kruse, W.F. (n.d.). *The projected image: A history of audio-visual education*. Association of Educational Communications and Technologies Archive, Box 26. College Park, MD.
- Kuhlthau, C. C. (1991). Inside the search process: Information seeking from the user's perspective. *JASIS*, 42(5), 361-371.
- Kuhlthau, C.C. (1993). *Seeking meaning: A process approach to library and information services*. Norwood, NJ: Ablex Publishing.
- Lembo, D.L. (1970). *A History of the growth and development of the DAVI/NEA from 1923 to 1968* (Doctoral dissertation). New York University, New York, NY.
- Lyon, B. (1987). Marc Bloch: Historian. *French Historical Studies*, 15(2), 195-207.
- Mandler, P. (2002, July). What is history for? *History and National Life*, 28-30.
- Marchionini, G. (1989). Information-seeking strategies of novices using a full-text electronic encyclopedia. *Journal of the American Society for Information Science*, 40(1), 54-66.
- Marchionini, G. (1995). *Information seeking in electronic environments*. Cambridge, UK: Cambridge University Press.

- Marshall, C., & Rossman, G. (1999). *Designing qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.
- McClusky, F.D. (1931). *Visual instruction: its value and need*. New York, NY: Mancall.
- McClusky, F.D. (1962). What was AV journalism in 1922? *Educational Screen and Audiovisual Guide*, 41(1) (405), 18-21.
- McClusky, F. D. (1981). DVI, DAVI, AECT: A Long View. In Brown, J.W. and Brown, S.N. (ed's) *Educational media yearbook 1981*. Littleton, CO: Libraries Unlimited.
- Middleton, D. and Edwards, D. (1990). *Collective remembering*. London, UK: Sage.
- Molenda, M. (2008). Historical foundations. In Spector, J. M., Merrill, M. D., Merrienboer, J. V., and Driscoll, M. P. (Ed.), *Handbook of Research on Educational Communications and Technology* (3rd ed., pp. 3-20). New York, NY: Lawrence Erlbaum Associates.
- Moore, H. L. (1997). *Guide to the archives of the association for educational communications and technology (AECT)*. National Public Broadcasting Archives University of Maryland Libraries.
- Nguyen, F. (2005). EPSS needs assessment oops, i forgot how to do that. *Performance Improvement*, 44(9), 33-39.
- Norman, D. & H. Rheingold (1990). An interview with Don Norman. In B. Laurel (Ed.), *The art of human-computer interface design* (pp.5-10). Reading, MA: Addison Wesley Publishing.
- Norman, D.(1988). *The psychopathology of everyday things*. New York: Basic.
- O'Day, V. L., & Jeffries, R. (1993, May). Orienteering in an information landscape: how information seekers get from here to there. In *Proceedings of the INTERACT'93 and CHI'93 conference on Human factors in computing systems* (pp. 438-445).

- Olson, D. R. (2005). Knowledge and its artifacts. In K. Chemla (ed.), *History of Science, History of Text* (pp. 231-245). Amsterdam, NE: Springer.
- Pirolli, P., & Card, S. (1999). Information foraging. *Psychological review*, 106(4), 643.
- Ramsey, G.F. (1938). *Educational work in museums of the United States development, methods and trends*. New York, NY: H.W. Wilson Company.
- Reiser, R. A. (2001a). A history of instructional design and technology: Part I: A history of instructional media. *Educational Technology Research and Development*, 49(1), 53-64.
- Reiser, R. A. (2001b). A history of instructional design and technology: Part II: A history of instructional design. *Educational Technology Research and Development*, 49(2), 57-67.
- Richey, R.C., Klein, J.D., Nelson, W.A. (2004). Developmental research studies of instructional design and development. In D. Jonassen (Ed.), *Handbook of Research on Educational Communications and Technology* (pp. 1099-1123). Mahwah, NJ: Lawrence Erlbaum Associates.
- Richey, R. C. and Klein, J. D. (2005). Developmental research methods: creating knowledge from instructional design and development practice. *Journal of Computing in higher Education*, 16(2), 23–38.
- Richey, R. C. and Klein, J. D. (2007). *Design and development research: methods, strategies, and issues*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Robertson, S. E. (1977). Theories and models in information retrieval. *Journal of Documentation*, 33(2), 126-148.
- Rogoff, R. (1979). *Instructional design elements in Thomas A. Edison's school film: An historical perspective* (Doctoral dissertation). University of Southern California, Los Angeles, CA.

- Ross, S. J. (1999). *Working-class Hollywood: Silent film and the shaping of class in America*. Princeton, NJ: Princeton University Press.
- Russell-Rose, T., & Tate, T. (2012). *Designing the search experience: The information architecture of discovery*. Boston, MA: Newnes.
- Saettler, P. (1953). *The origin and development of audio-visual communication in education in the united states* (Doctoral dissertation). University of Southern California, Los Angeles, CA.
- Saettler, P. (1990). *The evolution of American educational technology*. Englewood, CA: Libraries Unlimited INC.
- Saettler, L. P. (2004). *The evolution of American educational technology*. Greenwich, CN: Information Age Publishing.
- Sample, I. (2015, February 13). Google boss warns of 'forgotten century' with email and photos at risk. *The Guardian*. Retrieved from <http://www.theguardian.com/technology/2015/feb/13/google-boss-warns-forgotten-century-email-photos-vint-cerf>
- Schumpeter, J. A. (2013). *Capitalism, socialism and democracy*. New York, NY: Harper & Row.
- The Wheat Farmer (2014). Retrieved from <https://www.youtube.com/watch?v=-2Vlgj1IbX0>
- Ulrich, L. T. (1991). *A midwife's tale: The life of Martha Ballard, based on her diary, 1785 - 1812*. New York, NY: Vintage.
- U.S. War Department (Producer). (1918) *Fit to fight* [Motion Picture] United States: U.S. War Department.
- Wilson, T. D. (1999). Models in information behavior research. *Journal of Documentation*, 55(3), 249-270.

Appendix A

Determining the Status of Artifacts Related to the History of IDT

* Required

Pre-Search Processes (Locate sources of references to artifacts) *

- ☐ Saettler
- ☐ Iverson
- ☐ Lembo
- ☐ Other:

Pre-Search Processes (Extracted reference) *

Pre-search Processes (Category) *

Locate reference to artifact

- ☐ Book
- ☐ Bulletins
- ☐ Periodical articles ,serials and pamphlets , periodical articles
- ☐ Publication by organization
- ☐ Parts of a series
- ☐ Public documents , government documents
- ☐ Reports
- ☐ Unpublished materials , manuscripts, dissertations
- ☐ Newspapers
- ☐ Minutes
- ☐ Catalogs and Directories
- ☐ Unpublished materials
- ☐ Periodicals

- ☐ Other:

Search (Inputs) Non-Internet Tools

- ☐ Conversation
- ☐ Book
- ☐ Journal
- ☐ Archives
- ☐ Other:

Search Processes (Formulate 1) *

- ☐ Author, title, year
- ☐ Title, year
- ☐ Journal, author, year
- ☐ Journal, author, title, year
- ☐ Author, title, year, publisher
- ☐ Other:

Search Processes (Formulate 2)

- ☐ Author, title, year
- ☐ Title, year
- ☐ Journal, author, year
- ☐ Journal, author, title, year
- ☐ Author, title, year, publisher
- ☐ Other:

Search Processes (Formulate 3)

- ☐ Author, title, year
- ☐ Title, year
- ☐ Journal, author, year
- ☐ Journal, author, title, year

- ☐ Author, title, year, publisher
- ☐ Other:

Search Processes (Formulate 4)

- ☐ Author, title, year
- ☐ Title, year
- ☐ Journal, author, year
- ☐ Journal, author, title, year
- ☐ Author, title, year, publisher
- ☐ Other:

Search Processes (Select 1) *

- ☐ World Cat
- ☐ University library
- ☐ Google
- ☐ Google Scholar
- ☐ Periodical search engine
- ☐ Government archives
- ☐ Newspaper search index
- ☐ Pro Quest
- ☐ Guide to archives of the AECT
- ☐ Archive.org
- ☐ Forum
- ☐ Email
- ☐ Other:

Search Processes (Select 2)

- ☐ World Cat
- ☐ University library
- ☐ Google

- ☐ ☐ Google Scholar
- ☐ ☐ Periodical search engine
- ☐ ☐ Government archives
- ☐ ☐ Newspaper search index
- ☐ ☐ Pro Quest
- ☐ ☐ Guide to archives of the AECT
- ☐ ☐ Archive.org
- ☐ ☐ Forum
- ☐ ☐ Email
- ☐ ☐ Other:

Search Processes (Select 3)

- ☐ ☐ World Cat
- ☐ ☐ University library
- ☐ ☐ Google
- ☐ ☐ Google Scholar
- ☐ ☐ Periodical search engine
- ☐ ☐ Government archives
- ☐ ☐ Newspaper search index
- ☐ ☐ Pro Quest
- ☐ ☐ Guide to archives of the AECT
- ☐ ☐ Archive.org
- ☐ ☐ Forum
- ☐ ☐ Email
- ☐ ☐ Other:

Search Processes (Select 4)

- ☐ ☐ World Cat
- ☐ ☐ University library
- ☐ ☐ Google

- ☐ ☐ Google Scholar
- ☐ ☐ Periodical search engine
- ☐ ☐ Government archives
- ☐ ☐ Newspaper search index
- ☐ ☐ Pro Quest
- ☐ ☐ Guide to archives of the AECT
- ☐ ☐ Archive.org
- ☐ ☐ Forum
- ☐ ☐ Email
- ☐ ☐ Other:

Select 1.2.1 (Contained or Non-Contained) *

- ☐ ☐ Contained
- ☐ ☐ Non-Contained
- ☐ ☐ Other:

Select 1.2.2 (Contained or Non-Contained)

- ☐ ☐ Contained
- ☐ ☐ Non-Contained
- ☐ Other:

Select 1.2.3 (Contained or Non-Contained)

- ☐ ☐ Contained
- ☐ ☐ Non-Contained
- ☐ Other:

Select 1.2.4 ((Contained or Non-Contained) *)

- ☐ ☐ Contained
- ☐ ☐ Non-Contained

☐ Other:

Search Processes (Filter 1) *

- ☐ ☐ Results found
- ☐ ☐ Results not found
- ☐ ☐ Other:

Search Processes (Filter 2)

- ☐ ☐ Results found
- ☐ ☐ Results not found
- ☐ ☐ Other:

Search Processes (Filter 3)

- ☐ ☐ Results found
- ☐ ☐ Results not found
- ☐ ☐ Other:

Search Processes (Filter 4)

- ☐ ☐ Results found
- ☐ ☐ Results not found
- ☐ ☐ Other:

Search Processes (Verify 1) *

- ☐ ☐ Reliable source
- ☐ ☐ Unreliable source
- ☐ ☐ Unsure
- ☐ ☐ Other:

Search Processes (Verify 2)

- ☐ ☐ Reliable source

- ☐ ☐ Unreliable source
- ☐ ☐ Unsure
- ☐ ☐ Other:

Search Processes (Verify 3)

- ☐ ☐ Reliable source
- ☐ ☐ Unreliable source
- ☐ ☐ Unsure
- ☐ ☐ Other:

Search Processes (Verify 4)

- ☐ ☐ Reliable source
- ☐ ☐ Unreliable source
- ☐ ☐ Unsure
- ☐ ☐ Other:

Search Processes (Extraction 1) *

- ☐ ☐ Call number
- ☐ ☐ Digital version
- ☐ ☐ Other:

Search Processes (Extraction 2)

- ☐ ☐ Call number
- ☐ ☐ Digital version
- ☐ ☐ Other:

Search Processes (Extraction 3)

- ☐ ☐ Call number
- ☐ ☐ Digital version
- ☐ ☐ Other:

Search Processes (Extraction 4)

- ☐ ☐ Call number
- ☐ ☐ Digital version
- ☐ ☐ Other:

Search Processes (Extraction: Enter location) *

Search Processes (Other actions)

- ☐ ☐ Followed links within original search results
- ☐ ☐ Searched other documents for leads
- ☐ ☐ Search was complex, requiring steps outside of framework.
- ☐ ☐ Other:

Limitations Observed

- ☐ ☐ Artifact exists at single known location
- ☐ ☐ Artifact requires sign in to access
- ☐ ☐ Artifact does not exist digitally
- ☐ ☐ Artifact requires money to access
- ☐ ☐ Other:

Search Outputs *

- ☐ ☐ Status determined
- ☐ ☐ Status not determined
- ☐ ☐ Other:

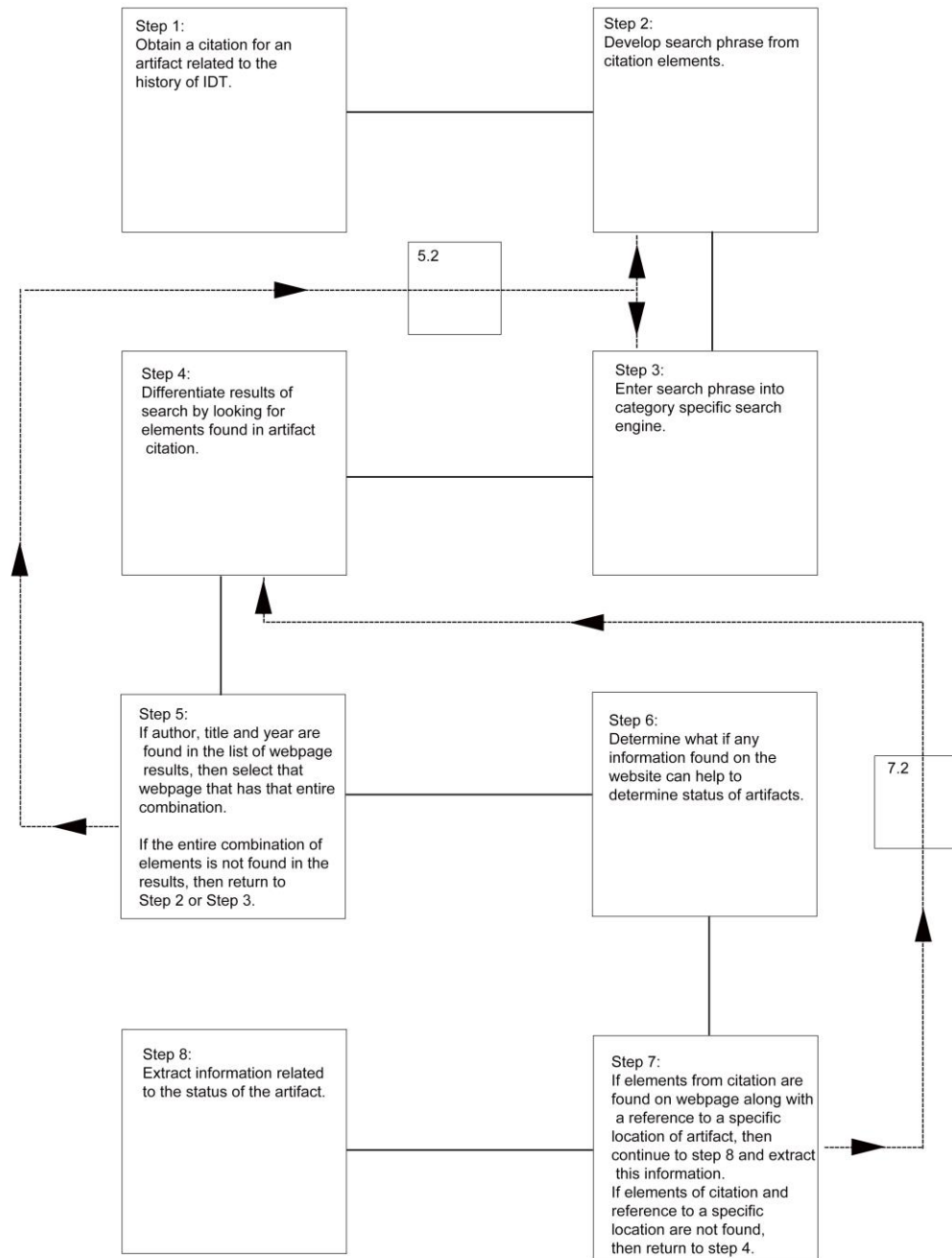
Time of search *

Appendix B

Organized categories from Saettler, Iverson and Lembo
Books (Saettler, Iverson, Lembo)
Bulletins (Saettler)
Periodical articles (Saettler), Serials and Pamphlets (Iverson), Periodical articles (Lembo)
Publication by organization (Lembo, Saettler)
Parts of a series (Saettler)
Public documents (Saettler), government documents (Iverson)
Reports (Saettler)
Unpublished materials (Saettler), manuscripts (Iverson) dissertations (Lembo)
Newspapers (Saettler, Iverson, Lembo)
Minutes (Lembo)
Catalogs and directories (Lembo)
Unpublished materials (Lembo)
Periodicals (Lembo)

Appendix C

Framework for Determining the Status of Documented Artifacts Related to the History of IDT (Electronic search)



Appendix D

Books

Hoban, Charles F., Charles F. Hoban Jr., and Samuel B. Zisman, *Visualizing the Curriculum*. New York: The Dryden Press, Inc., 1937. 300 pp.

Meriam, J.L. *Child Life and the Curriculum*. New York: World Book Co., 1921. 421 pp.

Miles, John R. and Charles R. Spain, *Audio-Visual Aids in the Armed Services*. Washington D.C.: American Council on Education, 1947. 96 pp.

Bulletins

Cook, Katherine M. and Florence E. Reynolds, *Opportunities for the Preparation of Teachers in the Use of Visual Aids in Instruction*. Pamphlet No. 89; Washington, D.C.: U.S. Office of Education, Federal Security Agency. 1940.

Dale, Edgar and Jeanne S. Chall, *A Formula for Predicting Readability*. Bulletin; Columbus, Ohio: Ohio State University Press, 1948. 15 pp.

Robbins, Irving, *Teaching Radio Program Discrimination*. Bulletin 56, Evaluation of School Broadcasts: Columbus, Ohio: Ohio State University, 1942. 26 pp.

Periodical Articles

Barnard, Henry, editor, *Barnard's Journal of Education*, "Phillip Emanuel von Fellenberg," III, 595.

Funkhouser, H.G. and H.M. Walker, "Playfair and His Charts," *Economic History*, 3:103-09, 1935.

Lewin, William, "Standards for Photoplay Appreciation," *English Journal*, 21: No.10, December, 1932.

Publications by Organization

Audio-Visual Materials of Instruction, Forty-Eighth Yearbook, Part I, National Society for the Study of Education. Chicago: The University of Chicago Press, 1949. 320 pp.

Hartley, William H *Audio-Visual Materials and Methods in the Social Studies*. Washington, D.C.: National Education Association, National Council for the Social Studies, 18th Yearbook, 1947. 214 pp.

The National Council of Teachers of Mathematics, Multi-Sensory Aids in the teaching of mathematics. Compiled by the Committee on Multi-Sensory Aids of the national Council of Teachers of Mathematics, Eighteenth Yearbook; New York: Bureau of Publications, Teachers College, Columbia University, 1945. 455 pp.

Parts of a Series

Brooker, Floyd E. and Eugene H. Herrington, Students make Motion Pictures, Washington, D.C.: American Council on Education Studies, Series II, Vol. V, No.7, 1941. 742 pp.

Friedrich, C.J. and Jeanette Sayre Smith, Radio Broadcasting and Higher Education. Studies in the Control of Radio, The Radiobroadcasting Research Project, Littauer Center, Bulletin, May 1942. 46 pp.

Instructional Film Research Program, Technical Report SDC-269-7-14, "The Classroom Communicator." 10 pp.

Public Documents

Statement of the Columbia Broadcasting System before the Federal Communications Commission during January, 1951 hearings.

Petition to the House of Representatives Committee on the Judiciary, Submitted by Allied State Association of Motion Picture Exhibitors, 1937, p.11.

Testimony of Commissioner of Education Earl J McGrath before the Federal Communication Commission on November 27, 1950. Docket Nos. 8736, 8975, 9175 and 8976.

Reports

Fourth national Radio Conference, Precedings and Recommendations for Regulation of Radio. November 9-11, 1925. 12 pp.

Mercey, Arch A., Streamlining Adult Films. Mimeographed abstract of lecture given at the National Council for Social Studies in Pittsburg, Pennsylvania on November 26, 1938: Washington, D.C: national Emergency Council, n.d. 12 pp.

Visual Instruction, 1914 Report of the New Jersey State Museum. 39 pp.

Unpublished Material

Dickson, Virgil E., "An Experiment in Classroom Instruction by Radio in the Public Schools of Oakland, California." Unpublished. 8pp.

Finn, James D., "An Analysis of Certain Factors Relating to the Implementations of teacher Education Program in Audio-Visual Aids to Instruction at Colorado State College of Education." Unpublished Master of Arts thesis, Colorado State College of Education, Greeley, Colorado, 1941. 289 pp.

Gallup, George, "An Objective Method for Determining Reader Interest in the Content of a Newspaper." Unpublished Doctoral Dissertation, Department of Psychology, University of Iowa, 1928. 224 pp.

Newspapers

Detroit News, November 5, 1927.

London Times, December 4, 1948.

New York Times, April 24, 1896.

Appendix E

Marchionini	Ellis	Kuhlthau
Recognition of a requirement: The recognition of a requirement are internal (personal curiosity) or external (Assignment given by a boss).	Starting: comprises those activities that form the initial search for information -- identifying sources of interest that could serve as starting points of the search.	Initiation: Recognize a need for information
Define problem: Key concepts and relationships are defined to clarify information need	Chaining: Following leads from sources to additional sources or references.	Selection: Selection of general topic or approach to pursue.
Selection of sources that might address problem: A search system is chosen	Browsing: the activity of semi-directed search in areas of potential search.	Exploration: Investigate information on the topic to gain a greater understanding.
Formulation of query: Match understanding of task with system selected	Differentiate: the individual filters and selects from among the sources scanned by noticing differences between the nature and quality of the information offered.	Formulation: Focused perspective on topic emerges and searching begins.
Execute query: Execution of the physical actions required to query a source.	Monitoring: is the activity of keeping abreast of developments in an area by regularly following particular sources	Collection: Gathering of information related to the topic.
Examine query results: Query response is examined to assess progress toward goal.	Extracting: the activity of systematically working through a particular source or sources in order to identify material of interest.	Presentation: Searches become redundant or of diminishing relevance.

Extraction of information from results: An information seeker can extract information by reading, scanning, listening, classifying, copying and storing information.	Verify: Checking the accuracy of a source.	
Reflection on process/iterate/stop: Information seekers often have to go through the process more than once. Knowing when to stop often depends upon goals.	End: End of information seeking process.	

Appendix F

Category	Search Tool
Books	World Cat, school library website, Google Books
Pamphlets	Google, periodical search engine, World Cat
Government Documents	WorldCat, Government archives, Google
Newspapers	University library closest to newspaper
Periodicals	Google, WorldCat
Dissertations	University where dissertation was written, Pro Quest
Catalogs	World Cat, related school library, Google
Minutes	Guide to archives of the AECT
Publications by organizations	Guide to archives of the AECT
Reports	WorldCat, Government Archives
Parts of a series	Google, government archives, the Internet Archive
Bulletins	Google, government archives, the Internet Archive
Unpublished materials	Google, WorldCat

Appendix G

Category	Information extracted for status
Books	Books are classified in libraries based on the Library of Congress Classification system and the Dewy Decimal system. Documentation of books will require this classification and libraries where the book can be found.
Pamphlets	Pamphlets are also often categorized according to Library of Congress Classification system and the Dewy Decimal system. In addition, pamphlets may also contain information about location within the library such as a specific location in a library, referred to as a 'stack'.
Government Documents	Government documents are organized by organized by specific government agency and are often organized by year, serial number, SuDoc number, title and CIS number.
Newspapers	Older newspapers are often archived on microfilm or microfiche and are also classified by call numbers.
Periodicals	Periodicals are also classified according to the Library of Congress Classification system and the Dewy Decimal system.
Dissertations	Dissertations are typically stored by the library associated with the university in which they were written.
Catalogs	May end up in the general section of libraries or they may end up in archives. The information extracted concerning status will depend upon the location of the artifact.
Minutes	Because minutes are part of an organization they are typically stored in archives related to that organization. The AECT archive at the University of Maryland contain the minutes of DAVI committees. These are stored according to box and number.
Publications by organizations	Publications by organizations may end up in the general section of libraries or they may end up in archives. The information extracted concerning status will depend upon the location of the artifact.

Reports	Government documents are organized by organized by specific government agency and are often organized by year, serial number, SuDoc number, title and CIS number.
Parts of a series	Parts of a series may end up in the general section of libraries or they may end up in archives. The information extracted concerning status will depend upon the location of the artifact.
Bulletins	Bulletins may end up in the general section of libraries or they may end up in archives. The information extracted concerning status will depend upon the location of the artifact.

Appendix H

Searching for the Nine Artifacts Not Found

The nine documented artifacts that were not located during the initial search were searched for again using approaches and tools that had not been used in the prior two searches. These approaches included contacting librarians for help, looking for clues in the citations, contacting organizations with connections to people listed in citations, and searching for help based on location found in the citation. Three of the nine were located during this search and together these nine searches took over two weeks to complete, this time included waiting for email replies from libraries, archives, and organizations.

On the second search of Virgil Dickson's *An Experiment in Classroom Instruction by Radio in the Public Schools of Oakland, California*, another reference was found in a 1957 dissertation that added a location, University of California Los Angeles (UCLA), to the citation. This new piece of information provided direction to the UCLA Library where Dickson's paper was searched for but not located. A librarian was then contacted via chat technology on the library website. I was sent an email the following day that provided the location of the Virgil E. Dickson papers 1920-1945. The website for these papers does not contain a listing of the papers so the Bancroft Library at UC Berkeley was contacted about the contents of the Virgil E. Dickson papers and told they did not have a copy of Dickson's unpublished article.

The second artifact searched for out of the nine was an undated, mimeographed History of the Keystone View Company, Meadville, PA. This documented artifact was used by Saettler (1953) in his dissertation. To begin a search was made for a college or university near Meadville, PA. Allegheny College was located and their library contacted. I was told they did not have the

Keystone View Company citation. A search was then made to find museums in Meadville that may have archives. Two possible museums were located, the Johnson-Shaw Stereoscopic Museum and the Crawford County Historical Association. An email was sent to Johnson-Shaw Stereoscopic Museum and they were also called but no contact was made either way. The Crawford County Historical Association website states that they charge \$25 when assisting with research and were not contacted.

The third documented artifact searched for James Finn's *Education Needs Massive Funds to Apply Technological Know-How* (1962). A large study by Finn was found and it was discovered that he had worked for many years at the University of Southern California (USC). I used librarian chat on USC's library site for assistance in finding Finn's work. The following day I received an email from a librarian with a thorough listing of Finn's work held by the USC library. *Education Needs Massive Funds to Apply Technological Know-How* was not on that list.

The *Public Documents Statement of the Columbia Broadcasting System before the Federal Communications Commission during January, 1951 hearings* appear to be located at the Records of the Federal Communications Commission. This is where Textual Records: Minutes of Federal Radio Commission and FCC meetings and hearings, 1928-70 are located. I emailed the National Archives to see if they had a copy of the CBS statement. For some reason this email was forwarded to the digital archives division and I was told they did not have records that old. I sent another email directly to textual records and have not heard back from them.

The fifth documented artifact search discussed here was Funkhouser and Walker's *Playfair and His Charts* (1935). Initially Google Books was searched and it was found that

Economic History, the journal *Playfair and His Charts* was published in, was a supplement for The Economic Journal. JOSTR was searched for *Playfair and His Charts* but could not be found. ProQuest was searched and listed Economic History as a journal that had been published for 42 years between 1926 and 1968. ProQuest had a lengthy citation for *Playfair and His Charts* but provided no location. Searched Virginia Tech's Newman Library for Economic Journal and found it exists there but not the supplements. Searched WorldCat for Economic History supplement to Economic Journal and found it in two locations. This was a difficult search to summarize but clues found in parts of the search did eventually lead to a positive result. Early on in the search it was discovered that Economic History was a supplement to The Economic Journal. But what was not known was that it appears that many libraries contain the Economic Journal but few seem to contain the supplement Economic History.

The sixth documented artifact searched was the *Proceedings of the First Annual Meeting of [the] National Academy of Visual Instruction, July 14-16, 1920*. Initially a simple search of Google was performed and no clues were found. The AECT Archive was also searched for clues and there was some information about the NAVI but no proceedings about their annual meetings. Searched for National Academy of Visual Instruction in quotations in Google and found many results. Found title in Google Books and searched for title in WorldCat. The WorldCat search resulted in several positive results.

The seventh documented artifact searched for was *Statement by Ralph Tyler in a speech, ALA Midwestern Conference, Chicago, January 27, 1962*. To begin this search, how Lembo (1970) used the citation in her text was examined for clues. It was thought that examining the text may provide evidence that Lembo had attended the speech but this could not be discerned

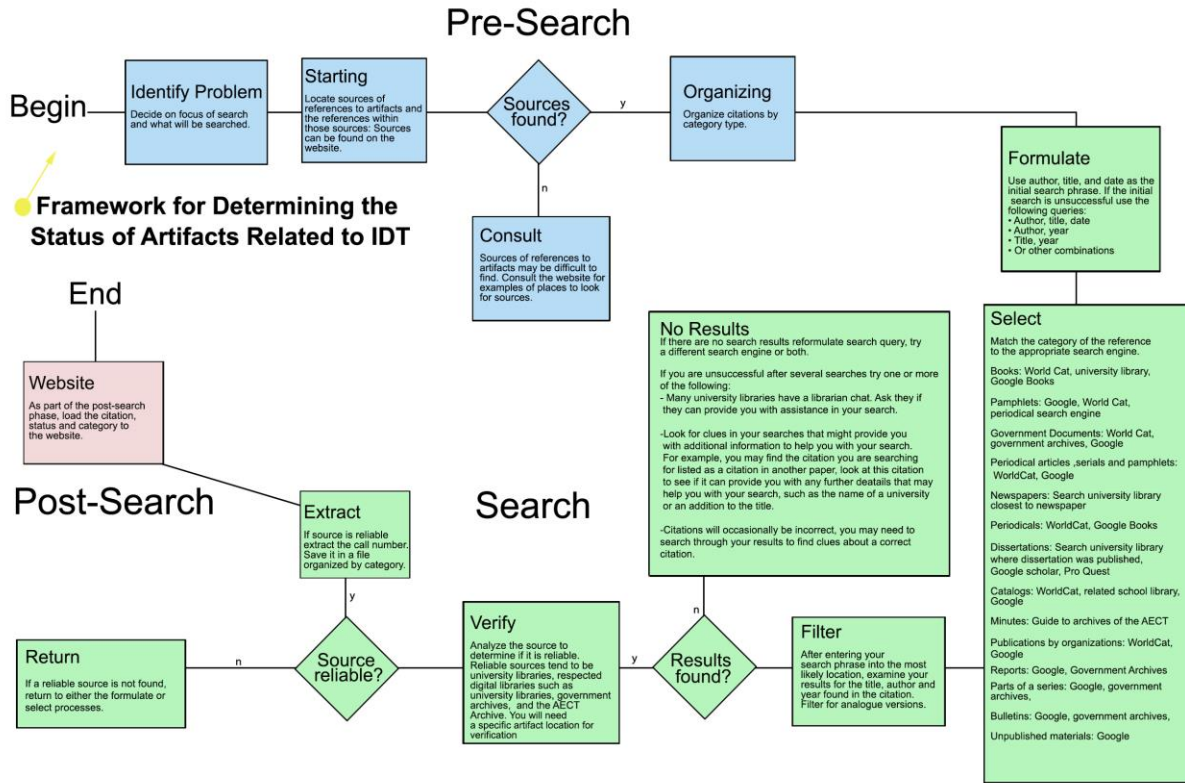
from the text. Searched Google for ALA Midwestern Conference, Chicago, January 27 1962 and found a listing on the American Library Association website of prior conferences. One of the conferences was listed as January 29-February 3. It was thought that Lembo may have gotten the date wrong but was informed by an ALA librarian that AALS, as an affiliate, had their events before the ALA Midwinter Meeting. The AALS had two full days of events, on January 27 and January 28. The item in the JELIS excerpt notes that on January 27: Ralph Tyler, of the Center for Advanced Study in Behavioral Sciences, Stanford University, will speak at a luncheon meeting on “Major Problems in Professional Education.” The ALA librarian also provided information about the Ralph Tyler Archives at the University of Chicago. The archives were searched and the speech was not found.

The eighth search was for *Minutes DAVI Executive Committee Meetings Kansas City, Atlantic City, Cleveland, 1948*. It seemed that the minutes should be in the AECT Archive in Series 3: Committees, 1947-1978. This series documents the activities of DAVI committees and includes correspondence, memoranda, minutes, and meeting agenda but there is not a specific listing of the meetings in Kansas City, Atlantic City, Cleveland, in 1948. The AECT Archive was contacted to see if they could provide more information. I heard back from an AECT archivist and was told they did have a copy of the minutes in their holdings.

The final citation searched for was the NAVI Visual Instruction Directory, 1930, VXI, No.1, Office of the Secretary, 1400 Oread P Ave, Lawrence, Kansas, The NAVI, June 1, 1930. 29 pp. Initially The Internet Archive, WorldCat, and Google were searched but no results were found. The AECT Archive file was then searched and found that, “In 1923, DVI merged with the Visual Instruction Association of America (VIAA) and the National Academy of Visual

Instruction (NAVI) to become the one dominant professional voice for the A-V movement in the nation. “Would a guide still be called NAVI if they had merged in 1923, seven years before 1930. Lembo’s citation in the text stated that, “Dent, however, had been Secretary-Treasurer of the NAVI in 1930, during which time the 1930 NAVI Visual Instruction Directory was compiled and published at his office, and understood the need for and nature of successful organizational work.” (p.) It would seem NAVI is the correct acronym. Search Google for “Dent NAVI visual instruction directory.” No results found. Searched University of Kansas for title, no results found. I contacted the AECT Archive about this documented artifact and did not hear back.

Appendix I



A Framework for Determining the Status of Artifacts Related to IDT

This document provides guidelines for finding documented artifacts related to the history of instructional design and technology. This document can be used with the framework website.

Pre-Search: During the pre-search stage, search for sources of documented artifacts. If references to are found, move to the search stage.

Inputs

It is necessary to first have a citation to a documented artifact to begin to determine the status of artifacts. References to documented artifacts can be found in many locations including: Books, the Internet, journals, dissertations, conversations and other locations. Many references to artifacts can be found in the dissertations of Saettler (1953), Iverson (1953) and Lembo (1953).

Documented artifacts fall into the following categories: Books; bulletins, serials and pamphlets; catalogs and directories; minutes; newspapers; parts of Series; periodical articles, serials and pamphlets; public documents, government documents; publication by organization; reports; unpublished materials; unpublished materials, manuscripts, dissertations, and periodicals.

Processes

The pre-search process involves two phases:

- 1.) **Identify problem:** Focus search on specific artifacts
- 2.) **Starting:** locating sources of references to artifacts and references to artifacts within the source
- 3.) **Organizing:** Organize citations by category type

Outputs

The outputs for the pre-search stage are references in the form of organized citations. Citations will often have a common format. For example, most citations will contain an author, title, year, location, publisher, journal, page number, volume number, etc. A common citation looks like the following:

Seaton, Helen. "A Measure for A-V Programs in Schools" American Council on Educational Studies, vol VIII, No.8 Washington, D.C.: The Council, 1940.

Organize these citations in the software of your choice, Excel, Word, Notepad, etc.

Search: During the search stage, documented artifacts are searched for using the and strategies.

Inputs

The inputs for the search stage are the citations found and extracted during the pre-search stage. Other inputs during this stage include: Internet tools and non-Internet tools. Internet tools are search tools including: Google, WorldCat, university websites, email, forums, blogs and other potential sources that could be used to determine the status of an artifact related to the history of instructional design and technology. Non-Internet tools include archives, the telephone and conversations. actual physical conversations and other sources.

Processes

There are five different steps during the search process step. These steps include: Formulate, select, filter, verify and extract.

- (1.) **Formulate:** Use author, title, and date as the initial search phrase. If the initial search is unsuccessful additional search strategies can be attempted. Be sure to remove all punctuation during the formulate phase. These search combinations include:
 - Author, year
 - Title, year
 - Or other combinations

- (2.) **Select:** The second step in the search process is to select the most likely tool to find the artifact. Artifacts related to the history of IDT are often categorized as books, reports, catalogs, etc. Searching for artifacts based on these categories can help us find the most likely location for the artifact to be found.

Books: World Cat, university library websites, Google Books
 Pamphlets: Google, World Cat, periodical search engine
 Public and government Documents: World Cat, government archives, Google
 Periodical articles, serials and pamphlets: WorldCat, Google
 Newspapers: Search university library closest to newspaper
 Periodicals: WorldCat, Google Books
 Unpublished manuscripts, dissertations: Search university library where dissertation was published, Google scholar, Pro Quest
 Catalogs: World Cat, related school library, Google
 Minutes: Guide to archives of the AECT
 Publications by organizations: WorldCat, Google
 Reports: Google, Government Archives
 Parts of a series: Google, government archives
 Bulletins: Google, government archives
 Unpublished materials: Google

- (3.) **Filter:** Filter through your results for the content found in the citation. If a match is located, select that location. If not, return to formulate. Filter for analogue versions of the artifact.

- (4.) **Verify:** Analyze the source to determine if it is reliable. Reliable sources tend to be university libraries, respected digital libraries such as JSTOR and Springer, government archives, newspaper archives, and the AECT Archive. You will need a specific artifact location for verification

- (5.) **Extract:** If source is reliable, extract the call number.

Example

- 1.) Formulate:
Seaton Helen A Measure for A-V Programs in Schools 1940

- 2.) Select:



- 3.) Filter:



- 4.) Verify

Studies. Series II, Motion pictures in education, v.4, no.5-8.

Author: American Council on Education
 Title: Studies. Series II. Motion pictures in education, v.4, no.5-8.
 Format: Book
 Published: [Washington, D.C.] 1940-44
 Description: 1 v.
 Contents: no.5. Projecting motion pictures in the classroom, by F.H. Neal--no.6. Motion pictures in a modern curriculum: a report on the use of film in the Santa Barbara schools, by R. Dell, L.F. Cox, L.A. Lathrop and others--no.7. Students make motion pictures: a report on the production in the Denver schools, by F.E. Brinker and E.H. Herington--no.8. A measure for audio-visual programs in schools, prepared for the Committee on Visual Aids in Education by H.H. Seaton.

- 5.) Extract

Library: Indiana University
 Bingham - Auxiliary Library Facility
 Call Number: LB5 A5 ser2 no.5-8

Post-Search: During the post-search stage the status of a documented artifact is documented.

Inputs

Inputs for the post-search phase are the locations of the documented artifacts searched for in the search stage of the framework if status was determined. If status was not determined, document that the status of the artifact could not be determined.

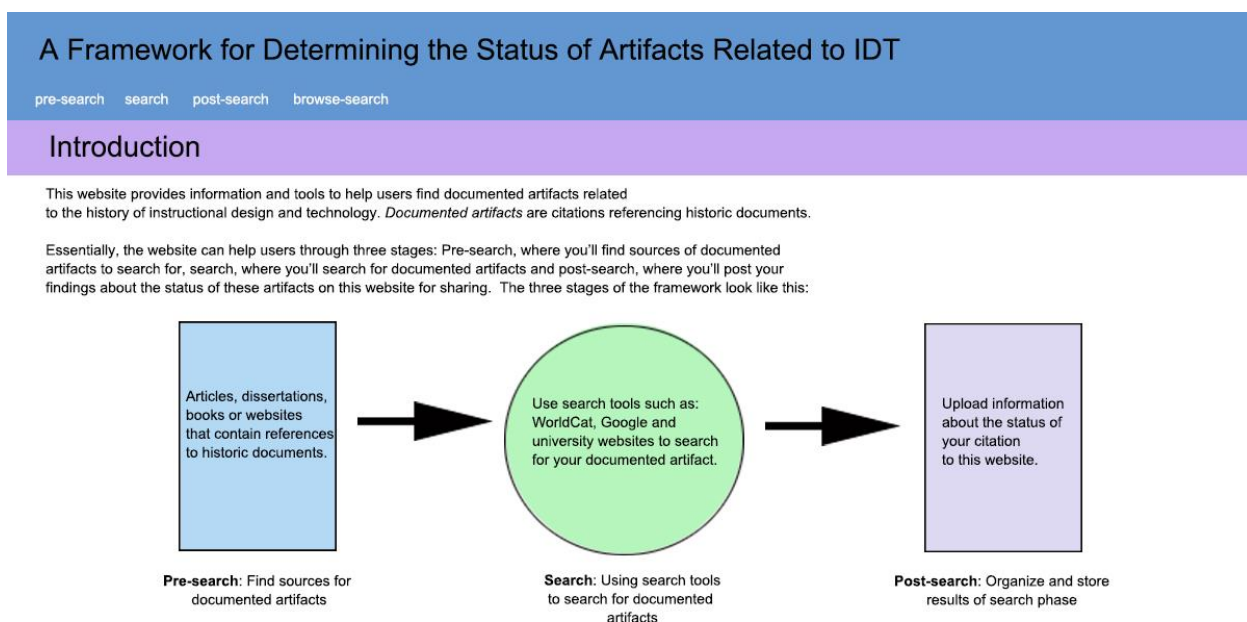
Processes

Share the results of search process.

Outputs

Outputs are the saved location of the artifacts.

Appendix J



Purpose of site

The archivist Michael Hill (1993) stated, "It is a mistake to leave historical analyses of the social sciences to professional historians. Historians, as disciplinary outsiders to the social sciences, typically do not understand our intellectual and organizational projects. In order to recover our own disciplinary history and advance our intellectual understanding of past events, social scientists must learn to use materials that historians have staked out traditionally as their own." This website is a step in that direction, an attempt by IDT practitioners to begin to understand the status of their own historic artifacts and organize them for current and future practitioners.

A Framework for Determining the Status of Artifacts Related to IDT

[introduction](#) [search](#) [post-search](#) [browse](#)

pre-search

Inputs

To determine the status of documented artifacts you need to find sources for documented artifacts, basically citations referencing artifacts related to the history of IDT. These citations can be found in many locations: Books, the Internet, journals, dissertations, conversations and other places. Many references to artifacts can be found in the dissertations of Saettler (1953), Iverson (1953) and Lembo (1953), each of whom wrote extensive histories of IDT. Additional documented artifacts can be found on AECT's history website and in other histories of the field. Lembo's dissertation can be found on ProQuest, and Saettler's dissertation can be requested from the University of Southern California.

processes

The pre-search process involves three steps:

- 1.) **Identify problem:** Focus search on specific artifacts
- 2.) **Starting:** locating sources of references to artifacts and references to artifacts within the source
- 3.) **Organizing:** Organize citations by category type

After you find a source of documented artifacts, you can begin to organize them according to their category. For example, references are often organized by the following categories in older dissertations: book, journal, dissertation, unpublished document, newspaper and so on. As you begin to copy and paste or type out your documented artifacts, organize them according to category.

outputs

The outputs for the pre-search stage are the citations found in sources, organized by category type. These citations will often have a common citation format. For example, most citations will contain an author, title, year, location, publisher, journal, page number, volume number, etc. A common citation looks like the following:

Seaton, Helen. "A Measure for A-V Programs in Schools"
American Council on Educational Studies, vol VIII, No.8
Washington, D.C.: The Council, 1940.

The organized outputs for the pre-search stage will look like this:

Serials and Pamphlets

History of the Keystone View Company (Mimeographed pamphlet) Meadville, Pa. (No date).

Johnston, Ella Bond, Art Exhibits in Public Schools, Fortieth Yearbook, National Society for the Study of Education. 1941, pp. 382-385.

Government Documents

Dunham, Franklin and Lowdermilk, Ronald R., Television in Our Schools, Bulletin no. 16 Federal Security Agency, Office of Education, Government Printing Office, Washington, D.C., 1952.

List of References on the Use of Pictures in Education, Library Leaflet No. 13, Bureau of Education, Department of the Interior, Government Printing Office, Washington D.C., December 1920.

Newspapers

Associated Press Release, 78 RPM is Dying of Old Age, De Moines Sunday Register, June 29, 1952.

United Press Dispatch, Madison State Journal, Madison, Wisconsin, January 18, 1953.

Manuscripts

Beemer, Richard Noyes, Utilization of Educational Television in Secondary Schools, unpublished master's thesis, State University of Iowa, 1951.

Dahl, John Edwin Community Resources in Teaching a Sound Motion Picture, Unpublished PhD dissertation, State University of Iowa, 1950.

A Framework for Determining the Status of Artifacts Related to IDT

introduction pre-search post-search browse-search

search



Enter your search and select the corresponding search tool based on category type from the drop down menu.

Inputs

The inputs for the search stage are the organized citations from presearch. Other inputs during this phase include Internet and non-Internet tools. Essentially, anything you can think of to help you find documented artifacts. Of course it is beneficial to start with tools we know will work: WorldCat, Google, university websites and more. However, if these traditional tools do not work you may need to contact librarians or archivists via email or telephone.

processes

There are five phases during the search process.

(1.) **Formulate:** Use author, title, and date as the initial search phrase. If the initial search is unsuccessful additional search strategies can be attempted. These search combinations include: Author, title, date; author, year; title, year or other combinations. Remove all punctuation from your search query.

(2.) **Select:** The second step in the search process is to select the most likely location to find the artifact. During pre-search you organized your documented artifacts according to category. The following is a list of where certain categories are most likely to be found:

Books: World Cat, university library, Google Books
 Pamphlets: Google, World Cat, periodical search engine
 Public and government Documents: World Cat, government archives, Google
 Periodical articles, serials and pamphlets: WorldCat, Google
 Newspapers: Search university library closest to newspaper
 Periodicals: WorldCat, Google Books
 Dissertations: Search university library where dissertation was published, Google scholar, Pro Quest
 Catalogs: World Cat, related school library, Google
 Minutes: Guide to archives of the AECT
 Publications by organizations: WorldCat, Google
 Reports: Google, Government Archives
 Parts of a series: Google, government archives,
 Bulletins: Google, government archives,
 Unpublished materials: Google

No Results
 If there are no search results reformulate search query, try a different search engine or both.

If you are unsuccessful after several searches try one or more of the following:
 - Many university libraries have a librarian chat. Ask them if they can provide you with assistance in your search.

-Look for clues in your searches that might provide you with additional information to help you with your search. For example, you may find the citation you are searching for listed as a citation in another paper, look at this citation to see if it can provide you with any further details that may help you with your search, such as the name of a university where the author may have worked.

(3.) **Filter:** After entering your search phrase into the most likely location, filter through your results for the title, author and year found in the citation. If a match is located, select that location. If not, return to step 1, formulate. If the search becomes complex you may need to contact a librarian for help, look for clues within your searches. Filter for analogue versions of the artifact.

(4.) **Verify:** Analyze the source to determine if it is reliable. Reliable sources tend to be university libraries, respected digital libraries such as JSTOR and Springer, government archives, newspaper archives, and the AECT Archive. You will need a specific artifact location for verification.

outputs

(5.) **Extract:** If source is reliable, extract the call number or location number. It will look like this:
 Organize your results by citation, category and status.

Indiana University
 Blmgtm - Auxiliary Library Facility
 LB5 .A5 ser.2 no.5-8



A Framework for Determining the Status of Artifacts Related to IDT

[introduction](#) [pre- search](#) [search](#) [browse-search](#)

post- search

Inputs

Inputs for the post-search phase are the locations of the artifacts searched for in the search phase of the framework if status was determined. If status was not determined, document that the status of the artifact could not be determined.

processes

Please fill out the following fields to submit the status of your artifact.
No fields required.

Submit a comma delimited text file or Excel file here.

Author, authors

Title

Journal

Date

Publisher

Location

Status

Metadata

Category

submit

submit

A Framework for Determining the Status of Artifacts Related to IDT

[Introduction](#) [pre- search](#) [search](#) [post-search](#)

browse and search

Browse documented artifacts in this database from the following topics:

[Author](#)
[Title](#)
[Journal](#)
[Date](#)
[Publisher](#)
[Location](#)
[Category](#)
[Metadata](#)
[Digital](#)

Search database on your topic of interest.

