

Writing for the PhD in Art and Design.

**Issues for Research Supervisors
and Research Students.**

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“One must still have chaos in oneself in order to give birth to a dancing star.”

-- Friedrich Nietzsche (2010 [1883]: 9)

“Poets say science takes away from the beauty of the stars – mere globs of gas atoms. I, too, can see the stars on a desert night and feel them. But do I see less or more? The vastness of the heavens stretches my imagination – stuck on this little carousel, my little eye can catch one-million-year-old light. A vast pattern – of which I am part... What is the pattern, or the meaning, or the why? It does not do harm to the mystery to know a little about it. For far more marvelous is the truth than any artists of the past imagined it. Why do poets of the present not speak of it? What men are poets who can speak of Jupiter if he were a man, but if he is an immense spinning sphere of methane must be silent?”

-- Richard Feynman (Quoted in Gleick 1993: 373)

We’re Different, Aren’t We?

One of the significant challenges of the university today is the growth and expansion of the research student population. Research training and doctoral education has exploded around the world, including doctoral education in the creative and performing arts. This development has occasioned many debates – none of them simple. Positions intersect, overlap, concur, and contrast. This paper examines several key issues about the doctorate and doctoral study to ask what aspects of doctoral writing ought to remain the same across all fields.

Past studies (Friedman 2000: 371; Durling, Friedman and Gutherson 2002: 11) have identified eight different kinds of doctorate. 1) The traditional or “old” PhD degree; 2) different forms of innovative or “new” PhD degrees developed for the demands creative and performing arts; 3) The technical doctorate with a title such as DrTech or DrEng in some areas of the creative arts, including digital media, software and design; 4) The professional doctorate in the practice of creative art, performance, or design, with a title such as DMus or DDes; 5) A studio doctorate awarded for artistic practice or artistic research in fine art, design, or performance, with a designation such as DA or DFA; 6) New forms of practice-based PhD in creative arts, performance, or design that function as variation within the framework of the traditional PhD; 7) The studio PhD awarded for studio practice in creative or performing arts or design supported by some form of explanatory essay or contextual document; and 8) A practice-based PhD in creative and performing arts or design that is somehow distinct from both the studio PhD and the traditional PhD

There is substantial confusion between the practice-based PhD that functions within the framework of the traditional PhD, new forms of PhD, the studio PhD awarded for studio practice in the creative and performing arts and design, and degrees labeled as a practice-based PhD that are neither a studio PhD nor a traditional PhD. Despite a growing literature on these subjects, confusions abound (see: Durling, Friedman, and Gutherson 2002).

This article will not examine these debates. A rich literature addresses these themes. Nevertheless, these issues bear decisively on the topic of doctoral writing in the creative and performing arts and in design, particularly by doctoral students who practice in the fields they research. The goal of this article is to ask what aspects of doctoral writing should remain common across all doctoral fields. To open the inquiry, a brief review of differences may be helpful.

While doctoral work in the creative and performing arts and in design may reflect differences from work in other fields, the degrees of variety and difference are not as significant as many authors believe. The attempt to find new and appropriate ways to bring the author’s voice and experience to bear on doctoral research has a long and distinguished history.

When Søren Kierkegaard completed his thesis at the University of Copenhagen in 1841, Danish universities required students to write all theses in Latin. Kierkegaard wanted to write in Danish. Kierkegaard's (1968 [1841]) thesis on the concept of irony with reference to Socrates made rich use of puns, jokes, and irony in Danish. Kierkegaard argued that he could not fully develop these concepts in academic Latin. The university required Kierkegaard to request permission directly from the king to write a thesis in Danish (Poole 1993: 3; Capel 1968: 9). The king granted permission, though Kierkegaard was still required to conduct his seven-hour oral defense in Latin. He did this successfully (Capel 1968: 9). While this was Kierkegaard's master's thesis, the master's degree at the University of Copenhagen in 1841 resembled the modern PhD. The Copenhagen doctorate was the far more extensive DrPhilos. This was only the second thesis for which the king gave royal permission to write in Danish, and the nature and tone of the thesis created extraordinary controversy (Capel 1968: 8-15).

Similar debates about tone and voice have erupted in nearly every field over the past thirty years of our own era. Karl Weick (1999: 797) considered the topic in organization theory and management studies, writing, "We seem to be in the midst of an active shakeout. What makes this period feel senseless is that half of the players are just beginning to grasp the messages of postmodernism, while the other half – those more partial to postmodernism – are saying, essentially, 'Look, it was a necessary episode of disruption, get over it, get on with it, write differently'."

We have not yet reached this point for doctoral work in the creative and performing arts or in design. Part of the problem is the fact that relatively few of our doctoral supervisors have had a PhD until recently, and those who did often completed their own doctoral studies supervised by professors who did not themselves have a PhD. The lack of a PhD among supervisors meant a significant gap in supervision knowledge, experience, and skill.

In the course of supervising the PhD, supervisors transmit to students much of their own knowledge in the area of research skills, research methods, and comparative research methodology. A supervisor without a PhD generally will not have had the experience to gain the required knowledge and skill. Whether the gap occurs in the first generation, or when someone earns a PhD from a supervisor without the requisite knowledge, doctoral supervisors with a broken lineage are unable to pass on to their students the kinds of research knowledge required for a first-rate PhD. Research training is an apprenticeship in the craft of research. Part of this training involves tacit knowledge, knowledge embodied in a traditional master-apprentice relation.

In the creative and performing arts and design, many universities appointed professors of practice who did no research and the appointment required no research responsibilities. In recent years, however, some of these universities began asking professors of arts practice to supervise research students. Unfortunately, no one in these universities considered the concept that a professor might not be a researcher by the specific terms of the professorial appointment. The administrators who initially appointed professors for practice and professional skill without research were not usually the administrators who required the practitioner professors to undertake doctoral supervision. As a result, university administrators do not reflect over the gaps in knowledge or understand what it means when they ask professors who do no research to supervise research training. This has created serious problems in many universities around the world. This paper will not discuss those problems other than to identify the fact that there is a knowledge gap.

There is, indeed, a gap. For example, many Scandinavian universities maintain a colloquial rule of thumb that a professor should have done research to the equivalent of two strong PhD degrees to earn promotion from the rank of associate professor to full professor. In Anglo-American universities, there was once a common motto, “It takes a doctor to make a doctor.” This was a way of saying that the skill and experience gained in earning a PhD equipped a person to do the work of expert supervision. These traditions never existed for doctoral work in the creative and performing arts or design. Many of the professors who now supervise PhD programs were appointed under academy rules rather than university rules. They were appointed for professional excellence in painting, sculpture, architecture, music, or design. Many were appointed to a term of 5, 6, or 7 years with renewal based on professional performance or exhibitions rather than tenure based on research and publication.

Along with this comes a second gap in knowledge and experience. This is a broader awareness of intellectual issues across the disciplines, ranging from philosophy and the humanities, to comparative research methodology and philosophy of science.

Here, there is a third gap visible in the differences of early specialization of the Anglo-Australian and Bologna systems and the work required for a PhD at a class one North American research university. In the UK, Australia, and Bologna system, students take a 3-year subject degree followed by a subject-specific master's, or – in Australia – a 1-year honors program. The PhD is a 3-year degree program, but UK and Australian universities specifically forbid coursework in the PhD program. As a result, students in the creative and performing arts and design move from studio or professional practice degree work or the bachelor's degree to deeper and more extensive practice at the master's level. Then, they move on to a PhD without the kinds of training a comparable student would have had in North America. More challenging yet, these students often arrive in a doctoral program with little or no experience in writing, and none of the basic courses in research skills that students require before they move from developing research skills to using research methods.

The contrast with PhD work in a research-intensive North American university is dramatic. These are the universities classified by the Carnegie as Foundation as “RU/VH,” “RU/H,” and “DRU” -- Research University/Very High Research Activity, Research University/High Research Activity, and Doctoral Research University.

To gain admission to a doctoral program in North American, students must first hold a bachelor's degree. This already sets a clear standard. Earning a bachelor's degree at nearly all North American universities and colleges requires that students take discipline-specific courses as well as a broad sequence of courses in general studies. Physics students take history and art. Musicians take math and psychology. Historians study science and literature. Everyone, regardless of their own field, will study across other fields on the premise that an educated citizen requires broad knowledge as well as deep knowledge. Along the way, students learn to write, and they learn to understand how scholars and researchers in their discipline field think. Some programs also require a master's degree, and other students earn a master's degree before moving on to a doctorate. The master's degree that follows is a 1-year or 2-year program of subject field depth courses and a research thesis.

The PhD program is a research-training program. The program culminates in a thesis representing an original contribution to the knowledge of the field. PhD programs typically require coursework to ensure that a PhD candidate knows his field before he or she advances to candidacy for the PhD. This coursework always includes subject field depth courses, as well as research methods courses and courses in comparative research methodology. It often includes breadth courses for appropriate skills and knowledge from related fields. Many universities assess incoming doctoral students, requiring specific coursework where skills and knowledge are lacking. Most universities have a language requirement, where students must demonstrate an ability to work in one, two, or even three languages in addition to their native language or university working language. Before advancing to candidacy, students at most universities take a series of comprehensive exams. Only after passing the examinations do students advance to candidacy and present a thesis topic.

The differences between the North American and Bologna systems are massive, particularly in the creative and performing arts and design. In the North American system, bachelor's students have 4 years of preparation with 2 years in a subject field, 2 years of broad courses, and extensive practice in reading, writing, and rudimentary research. This is followed by a master's degree that covers the subject field in depth and research skills. Bachelor's students in the Bologna system have 3 years of subject-field education in the creative and performing arts and design with little writing and no research, followed by 2 years more of deeper subject field knowledge. In Australia, they may have a 4-year honors degree with 3 years of subject field courses followed by one year of writing and research. In the 3+2 system, the master's degree adds subject field depth, in the creative or performing arts or design, but no serious research. The North American master's covers both subject depth and at least some research skills for the master's thesis.

In the North American system, PhD students typically spend several years in coursework and research methods training before advancing to candidacy. At this point, they know enough about the field and about research to propose a thesis subject and do the research. The North American PhD typically lasts from 4 years to 7 years, with 5 or 6 years as a common average.

In the Bologna system and the Anglo-Australian system, the PhD lasts 3 years. In Australia, students propose their research project to gain acceptance. In the Anglo-Australian system and the Bologna system, this is not as great a problem in the sciences, engineering, and technology as it is in the humanities. These students typically work in laboratories where much of the work is done in teams under the supervision of an experienced senior researcher. These students still have the benefit of the master-apprentice supervisor relationship, and this makes up for some of the gaps in the system. The case is different in the humanities and in the creative and performing arts and design. The lack of development, mentoring, and fundamental skills is often visible in problematic thesis work and later career difficulties with respect to research.

The time dedicated to a task involves practice, experience, and mastery. The opportunity to study, learn research skills and methods, and develop the habits of mind required for successful research deepens and ripens with time and expert guidance. All told, a PhD at a good North American university requires an average of 9 to 12 years from start through bachelor's, master's, and doctoral degrees. The new norms governing the Bologna model and the Anglo-Australian model average between 7 and 8 years. The extra 2 to 5 years and the skills that students acquire during those years make a huge difference.

But these figures on total time from entering university to completing a PhD hides a more serious problem with respect to the PhD in creative and performing arts and design. When comparing the two systems, the North American general education requirement makes an immediately visible difference. Everyone earning a PhD in this system will have a significant amount of work and practice in analysis, logic, rhetoric, writing, and some research skills together with a broad range of subject knowledge across domains by the time they have completed the 5 or 6 years leading to the master's degree. The additional 4 to 7 years builds on this foundation.

The 3+2 system in the Bologna model generally focuses on subject-field knowledge and skill. In creative and performing arts and design, this means 5 years of intensive work in the creative and performing arts or design. Some programs involve a modicum of reading and writing in the history of the discipline and possibly some work involving writing, typically for personal journals, reflective practice programs, or opinion essays. Nearly none of the 3+2 programs in creative and performing arts or design involves analysis, logic, rhetoric, writing, and research skills. The demand for subject-field knowledge required by professors and masters of professional practice nearly always leads to a curriculum emphasizing the courses that these professors and master teachers studied in professional academies and the courses that they would themselves have taught in the past. Even fewer 3+2 programs require a broad range of subject knowledge across domains outside the subject discipline.

The Australian honors degree system is somewhat different. It often involves a year of analysis, logic, rhetoric, writing, and research skills deemed important to prepare a student for PhD work, but one year does not allow time for breadth studies. Neither the 3+2 system nor the Honors degree offers the broad and deep foundation of 5 or 6 years in a general education system followed by a research master's. The gap in preparation and research capacity grows wider still comparing the difference between two kinds of PhD program. The 4 to 7 years of a North American PhD program offers research skills courses, methods training, and an appropriate range of preparation, advanced discipline courses, language work, and support courses over the course of a typical degree program. The 3 years of a PhD program with no course work offers none of this. In the natural and social sciences and some of the humanities, the undergraduate 3+2 foundation or the honors degree together with skilled supervision and induction into a research field make a significant difference. This is especially the case in the laboratory sciences, where doctoral students work together with a cohort of colleagues. In the creative and performing arts and design, however, the fact that work in cohorts tends to focus on practice and performance means that even cohort training does not typically improve research skills or research outcomes.

The problem becomes worse for doctoral students in the creative and performing arts and design when Bologna system or English-language universities outside North America take PhD students for doctoral work in a language different to that of their bachelor's and master's degrees. These programs ask students to do advanced research work and writing in a new language when they have not generally done extensive writing even in their own language. The tradition of prescriptive remedies for individual needs in North American PhD fills in knowledge gaps and skills gaps. This requires time, and it entails program costs. With many education systems adopting the 3-year PhD model, many systems reward universities for every student that graduate within 3 years while penalizing universities for those that fail to meet the 3-year norm. These systems cannot address some kinds of deficiencies. The result is an increasing number of PhD awards to students whose work demonstrates problems – occasionally severe problems.

The lack of breadth and the failure to develop an awareness of multiple domains leads to another gap. This is a failure to understand the deep and subtle work in other fields, and a failure to understand the reflective creativity of the people who do that work. Researchers in the creative and performing arts and design often describe the sciences as uniform, abstract, and objective. They often describe scientists as positivist without genuinely understanding what the word means, and they describe scientists as lacking in creativity, reflection, and psychological awareness because they do not study or read the work that scientists undertake. While this flat description is true of some scientists, it is also true of some artists. Even so, the creative arts do not possess a monopoly on creativity.

The *Oxford English Dictionary* (2013: unpagged) defines creativity in one of the shortest definitions in that extraordinarily long work: “Creative power or faculty; ability to create.” So does *Merriam-Webster’s* (2013: unpagged): “1: the quality of being creative, 2: the ability to create.”

These definitions are deceptively simple.

What does it mean to create? In mythic terms, it means to bring into being where nothing has been. This is the creation story of Genesis. But there are many kinds of creation and creativity. Bringing something from nothing is one among them. Another is creating from that which now exists, described as a metaphor in Shakespeare’s *Tempest* (Act II, Scene 1) where the actors speak of one who will “...carry this island home in his pocket ... and, sowing the kernels of it in the sea, bring forth more islands.”

This is effectively the distinction between two kinds of creativity – radical innovation and incremental innovation (see: Dewar and Dutton 1986; Ettlie, Bridges, and O’Keefe 1984; Nord and Tucker 1987).

Human beings have attempted to understand the nature of creativity since classical times. One aspect of creativity involves mastery of a medium. This takes time and practice. Several recent studies describe opportunity, access to an expert mentor, and extensive deliberate practice – skilled practice with coaching – as the difference between ordinary practitioners and those who become masters (see: Colvin 2008, Gladwell 2008, Syed 2010; See also: Siblin 2009). This is one face of creativity.

Situated knowledge is crucial to the deep skill that serves as the foundation of durable creativity. One must practice, drill and exercise to drive a car, master a sport, learn a language, develop an unconscious sense for mathematical patterns, play a musical instrument – or handle many of the technical craft tasks required of a designer.

Mastery, however, involves more than situated knowledge. Mastery requires the ability to look deeply into the ingrained patterns and analyze them. This is what distinguishes the master from the technician. Here, we speak of the great racing driver, the athletic champion, the person who has engaged the spirit of a language to move beyond daily use or fluency to eloquence, the insightful mathematician. In each of these fields, as in art, music, or design, one sees a range of talent that ranges from no knowledge whatsoever to the deep competence that characterizes expertise. The journey from apprenticeship to mastery always passes through analysis and the ability to articulate the necessary knowledge. In my view, this is one realm for doctoral work in the creative and performing arts.

Several great creative works of the Twentieth Century illustrate different meanings of the concept of creativity. Picasso's *Suite Vollard* is among them. It is an astonishing masterwork that encapsulates and summarizes a history of art as Picasso saw it in the 1930s. In these works, Picasso gives free rein to the plastic sense of line in space, collapsing an archeology of time into the frame of each among the one hundred etchings in the suite.

Another aspect of creativity is looking at what others have seen and described to understand facts in a profoundly different way. One example of this is Einstein's (1998 [1905]: 85-98) famous paper on Brownian motion. This paper established the physical reality of atoms at a time when many physicists were unable to agree on whether atoms did, indeed, exist or whether they were no more than a useful heuristic device. Einstein examined well-understood facts that physicists and chemists had long accepted, bringing them together with well-known observations. But this paper was radical because it reframed these facts and observations in a way that shed light on a basic physical problem that had not yet been solved (See also: Stachel 1998).

The tough nature of creativity comes into sharp focus when research requires us to reframe a problem entirely by recasting earlier challenges in a new light. Einstein is a good example of this, as well, and Einstein's great papers of 1905 show how it is possible to look in new ways at what others have seen and discovered to find new and startling results.

Of course, Einstein is also known for another kind of creativity, and the work that led to it relied on deep physical intuition combined with a rigorous sense of inquiry that drew on Euclidean logic and a philosophy of science anchored in Hume. In one of his five great papers of 1905, Einstein shaped the theory of relativity, paving the way to our modern understanding of physics and the electrodynamics of moving bodies (Einstein 1998 [1905]: 123-160). Another fundamental contribution to relativity examined the relationship between inertia and energy (Einstein 1998 [1905]: 161-164). Still another contributed to quantum theory by examining the production of light (Einstein 1998 [1905]: 177-198).

The *Suite Vollard* is, for me, a creative masterpiece of the past hundred years. I would not argue that the *Suite Vollard* is greater or more creative than Einstein's five great papers of 1905.

It is pointless to ask whether Picasso or Einstein had the more creative mind. They worked in different fields and there are many kinds of creativity – at least as many as the many kinds of intelligence described by Howard Gardner (2004, 2009: 77-102). Those who wish to understanding the nature of creativity more deeply should read Kaufman and Sternberg (2010) for an overview or Gardner (2009: 77-102) for a concise examination. The point is that creativity is neither simply nor exclusively the province of the creative and performing arts.

Society ascribes the property “creativity” to such fields as the creative and performing arts, to design and architecture, as well as to fields labeled as creative industries. These fields represent the qualities and properties of creativity for the societies they serve. It does not follow from this that the individuals in these fields are in fact more creative than individuals in other fields.

Rather, creativity is a human quality that we find among the best practitioners of most professions. Indeed, we can reasonably argue that creativity is distributed in fairly equal proportions among human beings across all fields.

Those who work in the creative and performing arts do not understand this. I once heard a dean of art, architecture, and design argue for the validity of what he labels “creative research” on the basis that “art and design carry our culture” while arguing that science and technology do not. His claim was that we measure the quality of university-level work many fields based on research, but we cannot measure art, architecture, or design based on published research. Instead, he argued that we must measure artists, architects, and designers on what he called “creative research outputs.” Had he asked to measure productivity in the creative and performing arts and design based on professional productivity and creative work as most North American universities do, there would be no problem. The problem is this: he insisted that creative production is a form of research for which universities must award a PhD.

If the claim that “art and design carry our culture” were true in the exclusive sense that he meant it, this would not demonstrate the validity of “creative research outputs.” Nevertheless, the claim is only true in a limited sense. While it is true, it is equally true of mathematics, information technology, or politics. All human actions and institutions create and “carry our culture.”

Are we different, those of us in the creative and performing arts and design? Yes. But how different are we? Our traditions differ, our media differ, the things we do and the ways we behave generally differ to people in other fields – much as theoretical physicists differ from theologians, chefs from politicians, and cellists from mechanics.

Nevertheless, we're not as different as we'd like to think. As we become more confident in our research, we will begin to understand just how much we can use from other fields, and how we can use it. Now that we're different, how are we the same?

Why Earn a Doctorate? What Kind?

Despite an uneasy relationship with universities and academic life, many practitioners in the creative and performing arts earn a living in the university. The culture of artistic creation does not always seem to function within academic norms, and numerous studies and debates point to a mismatch in values and approaches.

Many would like to earn a living as artists, actors, or musicians. Despite their wishes and aspirations, the market in these fields is never large enough to make this possible for all who wish to do so. In design and digital media, some suggest that life is greener in business, private industry, or design practice, but the demands are equally great. Having been an artist, and occasionally a successful one, I can state that struggling to maintain a studio without a steady salary is never easy. Paid work in the creative and performing arts or design brings different challenges and problems to those of work in the university. On the balance, academic life offers a good mix of responsibility and freedom. Nevertheless, academic work does not provide the pure personal freedom that many hope for in art, design, or the creative industries. Few salaried jobs do – a steady paycheck comes with responsibility to a manager, and even the top manager in a university or a firm answers to a council or to the shareholders.

Few creative and performing artists earn a living making and selling art or performing, far fewer than 1%. The vast majority of individual artists buy artistic freedom by doing something else to subsidize their art.

Professional design is challenging and the design profession offers many rewards. Most designers work for someone and follow directions as employees do in most industries. Design firms follow the old guild patterns. The design profession is not a democracy. The master is the autocrat who rules the studio. Bryan Byrne and Ed Sands (2002) describe the working life of design studios in a book on the creative industries, while an historical work (Darnton 1984) and a novel (Vonnegut 2011) both give a sense of what life was for apprentices. Working in the master's studio is not a free life.

Many creative and performing artists and designers work in the education sector. This includes those who can sometimes make a living – or part of a living – as artists or designers. Nevertheless, universities do not pay us to work directly as artists or designers. Universities pay us to teach. We help others to develop their skills. Universities also pay us to do research. The twin roles of teaching and research entail demands and responsibilities. The majority of us relate to different industries or professions from positions in academic life. We serve the community by teaching aspiring professionals the skills they will need in professional life. We serve the larger world of human knowledge by answering research questions. Some researchers also serve the community by solving specific research problems. We also teach research students how to do research. These are PhD students.

Academic work entails contract responsibilities to employers, students, colleagues, and community. While this limits our freedom, most of us sought the jobs we hold and agreed to these responsibilities by signing a contract. Some aspects of our jobs changed in recent years as schools of the creative and performing arts and design (including architecture) shifted from practitioner schools to research schools. Some who enjoyed the old way of life do not enjoy life after the transition to research schools. The current situation is nevertheless the same for those who welcomed the change and for those who did not. The change has come. We cannot go back.

The question is how to move forward. An important branch of inquiry in the scholarship of teaching and learning has blossomed in recent years. The scholarship of teaching and learning involves reflection and reflective practice on how to teach, study, and learn in the disciplines and fields of the modern university at a time of great change. It also involves research, interpretation, and other forms of inquiry. The Carnegie Commission has been central in developing this field, sponsoring influential studies and significant works (Boyer 1997; Huber, Taylor, and Morreale 2002; Hutchings, Huber, and Ciccone 2011). Those who genuinely question university work and academic life will find this approach useful for framing problems in ways that open them to solution. The scholarship of teaching and learning offers ways to understand the nature and rationale behind the activities that have a genuine purpose even though they may seem useless. Moreover, it offers opportunities to examine issues from multiple perspectives, learning from others and adapting their solutions to the genuine problems we face.

Every human system requires improvements. This is especially true of systems such as universities and professional schools. These systems accumulate cultural patterns, behavioral artifacts, and rules that take on a life of their own. (For my view on this, see: Friedman 2003, Friedman 2007.) Inertia preserves institutional patterns, just as momentum creates them. We enact creative change when it matters enough to invest the time to generate the momentum for new patterns against the inertial energy of the old. Unlike design firms, art galleries, or dance companies, universities are representative democracies with a legitimate constitutional structure. Universities are not pure democracies, but different kinds of partial democracies in which different stakeholder groups have differing levels of voice and authority. In this context, action based on expertise and participation goes further than complaint.

Life outside the academic world is much more difficult than academic life. I dislike colloquial expressions contrasting the “real world” with the academic world. The university world is as real as any other. But it is a real world with uncommon benefits for those who work within it, a world offering protections and benefits to which few employees with a steady salary can aspire. Freelance artists, musicians, actors, and designers have greater freedom than we do. Despite their freedom, or perhaps because of it, they do not have an employer who ensures that they will have a regular salary to buy food, pay the rent, or cover the mortgage.

Times are changing, and perhaps they should. During the 1970s and 1980s, I observed life at many art and design schools. In many schools, the system worked well for faculty members and badly for students. The old art and design school system failed to meet important needs and it often failed to provide the services and benefits that these schools promised students as part of the contract for education. In reflecting on academic life, I suggest reflecting on responsibilities as well as demanding freedoms. The responsibility for research is one of these issues.

Some years ago, I proposed a simple solution for university-based schools in art and design. This can extend to all the creative arts and to architecture (Friedman 1997). Some people should do research. Others should not.

Some people should be studio professors or craft masters. This works well when studio specialists and practitioner experts do not control research programs, and it works well when research experts do not control the studio and craft skills programs. The problem in many schools is that studio professors without research skills sometimes attempt to control research programs. This is where problems begin.

Schools of the creative and performing arts routinely see cases where unqualified teachers demand authority over courses where they have no knowledge of research subjects and no expertise in required skills. Why does anyone with no interest in research want to be involved in research?

The answer to that question is institutional power. In research universities and universities that are moving to become research universities, research involves power, politics, and wealth. Research means access to money, staff positions, and resources. For this reason, many people who do no research and want no real engagement in research want to designate their activities as research. This enables them to enjoy the benefits of the resources allocated to research.

I did not write this article for those people. Neither I did write this for people who believe that practice is in itself a form of research. Neither, for that matter, do I address those who are interested in the professional doctorate, the studio doctorate, or other forms of doctoral education aimed at improved practitioner skills or advanced practice.

This article is addressed to those who develop research skills, either as students who must develop skills or as academic supervisors and teachers for those students. The PhD degree is a training program that teaches people to do research. For these people, doctoral education in the creative and performing arts and in design bears strong similarities to doctoral training in other fields.

Research is a way of asking questions. All forms of research ask questions: basic research, applied research, and clinical research. The different forms and levels of research ask questions in different ways.

Basic research involves a search for general principles. These principles are abstracted and generalized to cover a variety of situations and cases. Basic research generates theory on several levels. This may involve high-level theories (“macro”) covering wide areas or fields. It may involve mid-level theories (“mid”) covering specific ranges of issues. Or it may involve low-level theories (“micro”), not low in terms of quality but low-level in terms of a tight focus on narrow questions. Truly general principles often have broad application beyond their field of origin, and their generative nature sometimes gives them surprising predictive power.

Applied research adapts the findings of basic research to classes of problems. It may also involve developing and testing theories for these classes of problems. Applied research tends to be mid-level or low-level research. At the same time, applied research may develop or generate questions that become the subject of basic research.

Clinical research involves specific cases. Clinical research applies the findings of basic research and applied research to specific situations. It may also generate and test new questions, and it may test the findings of basic and applied research in a clinical situation. Clinical research may also develop or generate questions that become the subject of basic research or applied research. The most common form of clinical research for professional practitioners is diagnosis. A doctor or nurse needs to understand the health problems of a specific patient. A lawyer must study statutory law, case law, and precedent to win a case. An engineer must search among specific likely solutions for a specific solution in building a skyscraper, a bridge, or a boat.

Any of the three frames of research may generate questions for the other frames. Each may test the theories and findings of other kinds of research. It is important to note that clinical research generally involves specific forms of professional engagement. In the rough and tumble of daily practice, most professional practice is restricted to clinical research. There isn't time for anything else.

While most professional practice requires clinical research however, it is not the case that all practice is research. While these models map over to design quite well, the nature of professional practice in the creative and performing arts raises issues that require greater depth and nuance. In theater, for example, the work of the dramaturg is a form of research linked to performance. In music, acoustics and sound engineering play a role. In the new media arts or the union of art and science, research problems must often be answered before the work can be realized.

One of the problems in understanding research in the creative and performing arts and in design emerges specifically from these distinctions. It is likely that creative and performing practitioners are always involved in some form of research, much as designers are, but this does not constitute the practice as research.

While many have heard the term "reflective practice," reflective practice is not research, either, and reflective practice is not a research method.

What distinguishes research from reflection? Both involve thinking. Both seek to render the unknown explicit. Reflection, however, develops engaged knowledge from individual and group experience. It is a personal act or a community act, and it is an existential act. Reflection engages the felt, personal world of the individual. It is part of the learning process (Friedman and Olaisen 1999; Kolb 1984). Reflection arises from and addresses the experience of the individual as a single person or individuals in groups.

Research, in contrast, addresses a question in the world or in the mind. This question is distinct from the personal or communal. In some cases, the issues raised by reflective practice may become the subject of research. This includes forms of participant research or action research by those who engage in reflection that becomes the data. But research also addresses questions beyond or outside the researcher.

Research asks questions in a systematic way. The systems vary by field and purpose. There are many long-established research fields: hermeneutics, statistics, mathematics, physics, history, sociology, ethnography, ethnology, biology, medicine, chemistry, geography, law, philosophy, and more. They draw on many methods and traditions. Each has its own foundations and values. All involve some form of systematic inquiry, and all involve formal theorizing and inquiry beyond the specific research process at hand.

Comparing two distinct research streams focused on design practice will shed light on some of these issues.

In one of the most interesting design research programs of recent years, Henry Petroski (1992, 1994a, 1994b, 1996, 1997, 2008, 2012) studies design failures. Petroski studies the role of failure in moving toward success, and the relationship between the different aspects of the design process.

Systemic understanding – understanding the systemic nature of an artifact or process in its full setting – is among the key elements in successful design and design research. This works together with the ability to render tacit learning explicit for analysis and improvement. These factors are also involved in organizational learning and reflective practice (see Argyris 1977, 1990, 1991, 1992, Argyris and Schon 1974, 1978, 1996; Schon 1983, 1987; Senge 1990; Senge et al. 1994, 1999). This, in turn, led to the new work on presence (Scharmer and Kaufer 2013; Scharmer 2008; Senge, Scharmer, Jaworski, and Flowers 2004).

Petroski is engaged in research on the elements of successful design practice. So are Argyris, Schon, and Senge. Reflective practice is a technique that builds successful practice. It is not a form of research into practice.

At the same time, Argyris and others have developed a range of research techniques linked to reflective practice. This is described in Argyris, Putnam, and Smith's (1985) book on action science, a presentation of concepts, methods, and skills for research and intervention. Argyris and Schon (1990) later contrasted normal science with action science. More recently, Argyris (1993) wrote on ways to apply the findings of action science to practicing professional life, closing the circle in a continuous loop between theory and practice.

What is significant, however, is that neither practice nor reflective practice is itself a research method. Instead, reflective practice is one of an array of conceptual tools used in understanding any practice. It can also be applied the practice of research.

Merriam-Webster's Collegiate Dictionary defines the term research. It is “1: careful or diligent search 2: studious inquiry or examination; especially: investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws 3: the collecting of information about a particular subject” (Merriam-Webster's 1993: 1002; for more, see the Oxford English Dictionary).

These definitions cover clinical, applied, and basic research; theoretical and practice-led research; qualitative, quantitative, descriptive, interpretive, logical, mathematical, empirical, positive, normative, hermeneutic, phenomenological, and philosophical research, as well as expressive research.

What distinguishes research from other activities is what Mario Bunge (1999: 251) describes as the “methodical search for knowledge. Original research,” he continues, “tackles new problems or checks previous findings. Rigorous research is the mark of science, technology, and the ‘living’ branches of the humanities.” Synonyms for research include exploration, investigation, and inquiry.

There is room in academic life for all of us. Our responsibility is being clear and doing well at what we do. The purpose of this paper is to address the issues and skills that all research fields share in some essential way.

Research Training, Research Skills, Research Methods

At this point, it is time to examine what it is that distinguishes the PhD – the research doctorate – from other kinds of doctorate. Some kinds of field-specific doctorates may not share common requirements or purposes with doctorates in other fields. This chapter will not address these issues. It will explain the value of a traditional PhD in distinction from other kinds of doctorate.

The PhD degree has several purposes. Several purposes distinguish the PhD from other kinds of doctorate.

The PhD is a research degree and a license for those who practice and teach research.

The special role of the PhD as a teaching license determines several aspects of the criteria for a PhD. This license covers several kinds of teaching. First, it demonstrates the expertise of the graduated doctor to teach the content of a specific subject field. Second, it demonstrates the expertise of the graduated doctor to teach the research methods of that field. Third, it demonstrates the ability of the graduated doctor to conduct independent research. Fourth, it demonstrates the ability of the graduated doctor to supervise research students and train researchers.

Each of these key purposes determines central criteria for the PhD. Some aspects of any specific PhD program may entail other criteria -- this paper does not permit a full discussion of the PhD. The relevant issues are those that affect the PhD in relation to other kinds of doctorates in creative and performing arts and design, and in relation to practice-led research.

The role of the PhD as a license to teach research methods and train research students involves criteria for the PhD that may serve no purpose in any other research project. Those who earn a PhD must demonstrate specific skills to earn the degree even though they may never use these skills again in their own research. Rather, they require these skills for their future students.

Long ago, I spent two weeks with a master chef who prepared magnificent meals for a conference while he ate tuna sandwiches. When I asked him why, he told me that cooking was an art form: he did not want to eat food after working with it all day. He said that he tasted most recipes twice: first when another chef taught him to cook it so that he would know how it should taste; second, the first time he prepared it to make sure that it tasted the same way. He had the equivalent of a photographic memory for tastes, and tasting was a tool in his work. He only ate tuna sandwiches for the two weeks that I watched him cook. Nevertheless, I suspect that his “twice only, never again” principle was an exaggeration. He probably enjoyed many kinds of food when he was not at work. But the principle was clear.

Some skills that graduate students develop to earn a PhD are like the recipes in a chef’s repertoire. They master them to cook them for students. They may never eat them again.

The point is that PhD supervisors who cannot work with these skills are not properly prepared to teach research methods or to train research students. As research teachers and supervisors, their own research interests and needs come second to the needs of their students.

As long as the PhD is a license to teach and supervise, the PhD has specific criteria that may not involve the research supervisors do in their own research work. These conditions establish the criteria for earning a PhD.

Since a PhD is a research degree, the candidate must demonstrate that he or she is able to undertake and complete unsupervised research. The student does this by demonstrating the ability to make an original contribution to the knowledge of the field. The PhD thesis is the equivalent of the journeyman piece in the artisan craft guilds. To earn promotion from apprentice to a qualified working member of the guild, an apprentice had to make an independent work representing and embodying the craft skills of the guild. In the craft of research, this is an independent piece of research. It is embodied in the PhD thesis. Bakers and chair makers, blacksmiths and masons each made an example of craft work for promotion from apprentice to journeyman. An apprentice could only work in the studio of a master under the master's supervision. A journeyman could travel, seeking work in any studio or working freely on his own. The fresh graduated doctor has the same rights in the guild of the university. In the medieval university, the doctor had achieved the *licentia docendi* – the license to teach. The doctor could travel to any university and teach there. (This usage survives in those universities that offer the licentiate degree as a stepping stone between the master's and the PhD. In some universities, the licentiate permits one to teach at university level, and it is considered a demonstration that one is qualified to teach research courses and methods. It is not generally considered sufficient to warrant promotion to the rank of full professor unless a candidate has a significant record of published research.)

Because the PhD is a license to teach and supervise research, the candidate must demonstrate research skills that will eventually qualify her or him to teach research methods and research methodology before moving on to teach and supervise research students.

This entails many skills. Gordon Rugg and Marian Petre (2004: 6-7) offer a useful partial list of skills in their excellent book on earning the PhD: [Use of academic language] “correct use of technical terms; attention to detail in punctuation, grammar, etc.; attention to use of typographic design ... to make the text accessible; ability to structure and convey a clear and coherent argument, including attention to the use of ‘signposting’ devices such as headings to make the structure accessible; writing in a suitable academic ‘voice’; [Knowledge of background literature] seminal texts correctly cited, with evidence that you have read them and evaluated them critically; references accurate reflecting the growth of the literature from the seminal texts to the present day; identification of key recent texts on which your own PhD is based, showing both how these contribute to your thesis and how your thesis is different from them; relevant texts and concepts from other disciplines cited; organization of all of the cited literature into a coherent, critical structure, showing both that you can make sense of the literature – identifying conceptual relationships and themes, recognizing gaps – and that you understand what is important; [Research methods] knowledge of the main research methods used in your discipline, including data collection, record keeping, and data analysis; knowledge of what constitutes ‘evidence’ in your disciplines, and of what is acceptable as a knowledge claim; detailed knowledge – and competent application of – at least one method; critical analysis of one of the standard methods in your discipline showing that you understand both its strengths and its limitations; [Theory] understanding of key theoretical strands and theoretical concepts in your discipline; understanding how theory shapes your research question; ability to contribute something useful to the theoretical debate in your area; [Miscellaneous] ability to do all the above yourself, rather than simply doing what your supervisor tells you; awareness of where your work fits in relation to the discipline, and what it contributes to the discipline; mature overview of the discipline.”

A PhD candidate who cannot demonstrate these skills cannot teach and supervise research students. It is likely that he or she cannot conduct research either. Demonstrating these skills therefore establishes the basis for awarding or denying the PhD. The thesis is the journeyman piece in which a PhD candidate demonstrates mastery to the journeyman level of necessary research skills.

PhD research involves a subset of all possible kinds of research. It is a subset because the PhD serves to train researchers in the skills they will use in independent research. It is specific because it entails demonstrating skills that graduated doctors will need in teaching, supervising, and training the next generation of researchers.

What remains the same, and how do we build it? Given the lack of deeply rooted master-apprentice skills for the practice of research, we face understandable problems in building a research culture for the creative and performing arts and the design fields. These are new research fields, in contrast to fields with research cultures that go back through decades or even centuries of development. Some research fields, such as mathematics, rhetoric, and philosophy date back several thousand years.

Human beings construct and shape cultures through behavior and by encouraging specific forms of behavior. In apprentice programs, apprentices model and adopt the behaviors they observe around them. This creates tacit knowledge. Effective apprentice programs in research require more than a single master. They require an environment populated by skilled journeymen and masters. Schools in the creative and performing arts and design differ from mature research environments because they lack a large population of skilled journeyman researchers and master researchers. In many university fields, the norm is that most academic staff members have a PhD. The percentage of those who do is generally 75% or more of the academic staff. Most of these individuals studied with supervisors who had a PhD. Their supervisors in turn had a PhD, and so on back over decades. This anchors and embeds the research culture.

In schools of creative and performing art or design, the proportion of academic staff with a completed PhD often tends to run from 12% to 15% in schools based in research universities. The percentage is generally lower in independent schools for the creative and performing arts or independent design schools, including those independent schools that have been designated as universities of the arts. The result is a gap in cultural knowledge.

One way to improve the situation is by providing research students with skills information and giving them courses that allow them to practice the skills they study.

Despite the fact that other fields have well-established research cultures, many fields now face similar problems. Due to massive growth in student numbers in some university systems, there are too many research students to permit proper research training and supervision. Until recently, oral tradition and a master-apprentice system trained research students in most fields and helped transmit academic research skills. These skills differ from field to field, and discipline to discipline. They often differ among related sub-disciplines and they may differ within the same disciplines in different universities and nations.

The explosion of doctoral education in all fields brought about a shortage of experienced supervisors. This disrupted the master-apprentice system of earlier generations, forcing many students to make do with relatively inexperienced supervisors. The enormous recent growth of universities makes the situation worse, exacerbating these shortages with more research training and more doctoral students in nearly every field.

The shift to the Bologna 3+2+3 system in Europe and Australia intensifies the problem with a more rapid flow-through of larger cohorts. The goal of the Bologna system involved rationalizing education across Europe, increasing mobility and extending resources while reducing time to completion and reducing costs. Other goals included expanding access to higher education, reducing the elitism associated with higher degrees, and making the market in academic labor and research more mobile. The 3+2+3 systems have generally had all these effects, but there has been a price.

The intense, highly selective relationship that once existed between doctoral supervisors and candidates shifted to a curriculum-based system. At the same time, the curriculum based system falls apart at the doctoral level in nations that used master-apprentice programs while forbidding coursework for the PhD. The 8-year Bologna scheme reduces the former time for research training and doctoral completion in most fields by anywhere from 2 to 5 years, depending on the former patterns and norms of any individual university. With many more students and far less time, it is impossible to rely on the small-scale, intense practices that once led to graduated doctors.

Research training and supervision was not perfect in the past. Supervision skills differed, excellent researchers might be poor teachers, access to opportunities varied. These differences stay with us, even as the situation becomes more difficult for everyone.

As a result, scholars in all fields face some of the problems we face in the creative and performing arts and design. Today, however, we are fortunate to have a growing literature of resources to help individuals and schools to solve these general problems.

This growing literature outlines and explains the craft, guidelines, and traditions of research. These books can help to teach and develop good research habits, habits of mind and habits of behavior. These resources can help us to shape a research culture. These are not books on research methodology, methods, or technique. These books address the larger habits of mind within which specific research acts take place.

Here are several outstanding examples of this literature.

The Craft of Research by Wayne Booth, Gregory Colomb, and Joseph Williams (1995) is a central volume in the series of books on different aspects of the profession and practice of research. It is a superb introduction to research issues.

Supervising the PhD by Sara Delamont, Paul Atkinson, and Odette Parry (1997) covers the issues and skills of research supervision. The skill of tutoring and supervising research is even more difficult to acquire than the skill of doing research. In theory, studying for a PhD should help the doctoral student to develop research skills. No degree programs or general courses train research supervisors. Greater attention to supervising research students means that this literature is an important contribution. This book is one of the first and still one of the few that helps supervisors, whatever field they work in.

Getting What You Came For by Robert Peters (1997) and *The Unwritten Rules of PhD Research* by Gordon Rugg and Marian Petre (2004) are useful and well structured guides to general research issues and skills, as well as providing useful information on surviving and thriving as a doctoral student. I recommend these books to students and to their supervisors. Several dozen books offer advice on earning a research degree. Most are pedestrian and some are uninformative. A great many bad books mislead students who do not know enough to ignore incorrect information and problematic assertions. Peters (1997) and Rugg and Petre (2004) are filled with useful advice and well worth reading.

One common gap in doctoral education involves helping research students prepare for the transition from study to an active research career. Two books are particularly helpful. Robert Sternberg (2004) wrote *Psychology 101 ½* for psychologists and psychology researchers, but the career advice covers all fields. While Peter Feibelman's (1993) *A Ph.D. Is Not Enough!* is written for the sciences, it offers ideas that every scholar can use.

This body of knowledge summarizes the experience that a solid, first-rate supervisor would have shared with doctoral students in years gone by. Doctoral supervisors did not always transfer this body of knowledge, but the expectation was that they should do so. The ideal doctoral supervisor had several linked roles and responsibilities. One was tutoring, training the beginning researcher in the craft of research. One was advising, ensuring that the student's thesis was at a standard for successful completion. One was mentoring, preparing doctoral students for a successful academic career. Subject-discipline expertise was a necessary platform for expert doctoral supervision, but it was never sufficient. Good supervisors who take all three responsibilities seriously continually seek ways to improve their supervision skills.

The problem in doctoral education for the creative and performing arts and design is that we have many well-intentioned supervisors with deficiencies of which they are not aware. They do not know that they lack the knowledge, skill, and experience to fill the three roles of tutor, advisor, and mentor adequately. The shift to mass education in doctorates combined with doctoral awards in fields that lack a sufficient number of well-prepared supervisors means that supervisors and doctoral students alike must work to develop the skills they need. The sequence of books in this section forms the background to a sequence of materials on effective doctoral writing.

This group of books shares information that is the same for doctoral education in the creative and performing arts and design as it is for other fields. What comes next are the skills and knowledge that supervisors and their students need as the background for a solid thesis – and the foundation of a successful career marked by outstanding publications.

Writing for the Doctorate – Information for Supervisors and Doctoral Students

Understanding what a doctorate is and what it involves is a necessary foundation for understanding why research and writing skills matter. The broad, general background explains why these skills are important. These materials present the skills. Much of the material in this section is available on the World Wide Web at no cost.

Good writing is the foundation of good scholarly writing for the PhD thesis and research publishing. There are many style guides and manuals on writing. The best and most useful among these is one of the shortest and most direct. This is *The Elements of Style* by William Strunk and E. B. White (1999 [1918]). Commonly called “Strunk and White,” it remains the classic guide to writing good English prose. This short, 105-page volume offers clear, simply advice on how to master clear narrative. (While the fourth edition is well organized and particularly useful, the Bartleby.com web site offers the first edition (Strunk 1918) at no cost.)

Over many years, I have developed a workshop to review and summarize the essentials of research writing. In full form, it serves as a hands-on workshop with opportunities to review, edit, and actively develop examples of student work. There is also a stand-alone summary lecture to review and discuss the main issues in about three hours. This is available on the web in PDF format with slides for lectures by supervisors or student workshop leaders, and as handouts for those who wish to read the material (Friedman 2014). This workshop reviews the key elements of research and research writing, offering advice on how to write with a checklist of what to include in a research article or a research paper.

Research writing for those PhD students who complete their degree to move on to a career in research is inevitably linked to presenting papers. Conferences and seminars are central to sharing research and becoming visible as a researcher. PhD programs increasingly encourage students to present and publish conference papers as part of the degree program, and some now require it. During the PhD program or afterward those who master presentation skills stand out, and learning to present well is now a vital aspect of doctoral writing. Conferences and seminars are central for sharing research and for becoming visible in a research field, and they are a crucial mechanism for the visibility that leads to jobs at the start of a research career.

As with other aspects of research training and research writing, there is now a host of books on how to present. The best of many books on this topic is Robert Anholt's (2005) *Dazzle 'Em with Style: The Art of Oral Scientific Presentation*. Anholt is a professor at Duke University Medical Center who has made an art of helping researchers succeed in conference and seminar presentations. While Anholt wrote this solid, concise book for the natural sciences, it offers valuable advice for presentations in any research field. Doctoral students in the creative and performing arts and design will benefit from Anholt's thorough foundation.

A few years back, I developed a short, free guide to presenting papers for the International Association of Societies for Design Research specifically for researchers and doctoral students in design. It is available on the web (Friedman 2008). While Anholt is deeper and more comprehensive, this is more concise, it is free, and it has links to a rich selection of additional free web resources.

Another excellent book covers all kinds of presentations. Based on psychological research by Stephen Kosslyn (2007), this book also applies to research presentations.

Finally, comes the issue of writing for journals, the central medium of research communication. Two excellent books address the craft of scholarly publishing. Robert Sternberg's (2000) *Guide to Publishing in Psychology Journals* is the most useful among many guides to writing journal articles. Sternberg and a group of experienced authors and editors tell aspiring research authors what they most need to know about planning, writing, placing, and revising an outstanding journal article. While the authors focus on psychology journals, the chapters cover the key issues needed for articles in any research field. Franklin Silverman's (1999) *Publishing for Tenure and Beyond* discusses the relation of publishing to career development, offering important advice on conceptualizing and preparing a publishing strategy.

Here, too, doctoral students and their supervisors can find useful free guides and writing resources. Several publishers offer useful guides on topics from impact and writing effectively to getting published and disseminating the work. Elsevier and Emerald offer a particularly useful range of guides and resources. These materials are so extensive that it is important to spend time browsing and searching to locate everything on any given publisher's web site. The time this take will pay.

My own heuristic device for good writing is simple. Those doctoral students who read widely, read deeply, and read carefully build the foundation for a successful research career. They take careful, precise notes, and they use the information, ideas, and concepts on which they draw to develop careful and robust argumentation for their own work. The heuristic – my rule of thumb for the systematic writing activity that builds the strongest foundation for a research career – is building references carefully and, using them precisely, and always citing reference to their precise location in the source text.

There are objections to this approach. One takes the form of a question: “Isn't this what people do in all those other fields of research, scholarship, and science?” The answer to that question is, “Yes. Absolutely.” Now that we are different, this is what's the same when it comes to writing up our research.

The other objection is the idea of an exception to careful citation for paraphrase material. Paraphrase occurs where a researcher rephrases the ideas of a source document in his or her own words, using ideas from other writers while changing the words.

This is no longer an exception to the rules of quotation. Many researchers now refer to paraphrasing as “indirect quotation.” The same standards applies to all forms of quotes, direct and indirect (Slade 2003: 55-61, Smith 2000: 154.) The APA style guide now requires locating all quoted passages to the exact page in the source document. Paraphrases and indirect quotes should be located precisely – the APA style guide now encourages this (APA 2009, sections 6.03 and 6.04: 170-171). When I edit and supervise, I request this for the simple fact that authors who source their materials precisely typically read them more carefully, understand them better, and use them more effectively than those who do not. When I wish to know more as a reader, I can find it more easily. This change in style takes place against the major shift affecting all research fields in the global knowledge economy and the information age.

The amount of information in our era has grown exponentially. Researchers and scholars draw on increased amounts of information, and nearly no one in any active research field can now master the information in his or her own field. The explosion of transdisciplinary scholarship means that people often draw on research from fields outside their own.

This changes the ethics and requirements of quotation for three reasons. First, it is no longer possible to assume that all researchers in any field will have detailed knowledge of all or even many of the important source documents that everyone was once expected to know when each field was smaller. Second, it is vital to allow readers to learn more about what any source document says on a specific point – and the author must allow readers to learn more without reading the full source document to locate the issue under discussion. Third, an author must allow readers to challenge his or her views, and this is only possible by making the full underlying evidence for any articles transparent and easy to find.

Nevertheless, the most important issue is a fourth point: this disciplines requires and an author to review and re-read source documents when quoting them either directly or indirectly. This, in turn, helps the author to remember and use the material correctly. It allows the author to deepen his or her knowledge. It often leads an author to see the connections and recall related but possibly forgotten ideas that build and strengthen the author's argument.

One of my professors used to end nearly every lecture by reminding us to read the sources for ourselves, working with them carefully to think the issues through, and drawing carefully on these sources in building our own research. Her motto was, "Be true to your sources and they will be true to you." Over the years, I found this to be a useful tool and discipline in my own work.

The key skills of reference and citation form a simple, effective heuristic device for doctoral writers who want to build a durable career in publishing and research. My students and colleagues occasionally tease me by referring to them as "The Ten Commandments," but those who use them publish more than many of their peers, publish in better journals and conferences, and tend to be more widely read and cited:

"Ten Rules of Reference and Citation.

- 1) Use citations constructively to substantiate the argument of an article.
- 2) Use citations creatively to advance the argument of an article.
- 3) The author must argue a case in the explicit narrative of the article. External sources support an argument. External support for an argument cannot replace the argument. Do not confuse the two.
- 4) Use precise, fine-grained references that permit the reader to locate quoted material at the exact location in the source document. Fine-grained references allow the reader to question and challenge cited sources.

5) Treat direct quotations, indirect quotations, and paraphrases the same way. Give precise references for all quotations and cited sources.

6) Always review and re-read cited passages from referenced sources. This ensures correct quotes and accurate paraphrasing while helping the author to develop the meaning of the source text effectively. It also allows the author to reflect on text surrounding quoted material for added depth and possible use.

7) Never use second-hand references from other authors. Always check cited sources first hand.

8) Never use loose or vague references.

9) Each item cited in the text must appear in the reference list. Every item in the reference list must appear in the text.

10) Each source cited in the text requires an appropriate in-text citation and an entry in the reference list. Every entry in the reference list must be complete. All citations and all references must use the same style. All citations and references must be complete and consistent to be correct” (Friedman 2014).

This takes work. Every doctoral student in the creative and performing arts and the design fields has a professional goal. Mastery takes time: study time, rehearsal time, time to build skills, time to grow and deepen in the art to which each of us may dedicate a life.

Research is also an art, and if we intend to master the skills of research, we must give ourselves to the discipline of research. For the research doctorate, the PhD, this means writing. Of course, many who seek a PhD also recognize that effective writing and powerful argumentation will also support client proposals, grant applications, job applications, and even the poetic, personal reflection that we sometimes share with students and colleagues.

The goal of this paper is to help doctoral students and their supervisors achieve these goals. It is important to understand how and why the educational landscape has changed for those who pursue a doctorate in the creative and performing arts or design. These changes have made a huge difference to how we work in universities.

The new landscape creates massive opportunities for those who are willing to master the skills. As Karl Weick (1999: 797) says, “get on with it, write differently.” And know when to write the same.

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Prior Research

This chapter draws on the author's prior published research for the material discussing creativity (Friedman 2010), and for the section on research and reflective practice (Friedman 1997).

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About Ken Friedman

Ken Friedman works at the intersection of design, management, and art. His research focuses on strategic design and value creation for economic innovation. Friedman has done research in theory construction, research methodology, philosophy of design, doctoral education in design, knowledge management, and philosophy of science. He has done design policy studies for Australia, Estonia, Latvia, Lithuania, Norway, and Wales. In 2007, Loughborough University awarded him the degree of Doctor of Science, *honoris causa*, for outstanding contributions to design research.

Friedman is Chair Professor of Design Innovation Studies at Tongji University College of Design and Innovation, and University Distinguished Professor at Swinburne University of Technology Centre for Design Innovation, where he formerly served as Dean of the Faculty of Design. He is Adjunct Professor at the James Cook University School of Creative Arts, and Visiting Professor at the University of Technology Sydney Business School.

Friedman is Editor-in-Chief of *She Ji. The Journal of Design, Economics, and Innovation* published by Elsevier in cooperation with Tongji University Press. He is Chief Investigator of the Design Capacity Mapping Project for the CSIRO Future Manufacturing Flagship. He is co-editor of the MIT Press book series *Design Thinking, Design Theory*.

Friedman is a practicing artist and designer, active in the international laboratory of art, design, music, and architecture known as Fluxus. In 2015, James Cook University will tour an international exhibition of Friedman's Events.

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An extended biography and bibliography of Ken Friedman is available in PDF format at:

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