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The Graduation Thesis: Insufficient and Outmoded

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Abstract

Graduation theses are a part of many university programs, but have not kept up with advances in research, communication and technology. The author suggests a closer look at the assumptions behind a required graduation thesis, and finds that an alternative with more flexibility works better for the profound changes occurring in research and academics today. Positioning the graduation thesis as one option among many of equal value would allow the students to avail themselves of tools and techniques they are more likely to use after graduation.

Two of mankind's greatest breakthroughs are writing and the scientific method (Atlantic, 2013). The research paper, or thesis, brings these two together in a highly codified, explicit way. It is normally the pinnacle of a program of learning and includes a presentation of investigative work in a structure that allows for collaboration. Students research a topic, assemble resources, organize, draft, edit and format information with a bibliography.

Yet—much like the idea of multiple intelligences replacing a single measurement—society and information technology have been diversifying the ways knowledge is collected, organized, collaborated upon and presented in an educational system. Other methods, techniques and styles have been shown to be effective as a way to culminate this stage of learning in an adult's life.

As we prepare our students for the future—a future where a new set of skills is necessary to work, communicate, play and find value in their lives—asking them to write a research paper is outmoded, and no longer sufficient. Much of this change is related to information technology, but a significant amount is a simple progression that each generation makes from conventions for expressing the scientific method and research methods, along with changes in writing techniques and style.

To prepare our students for the future graduation thesis, or its equivalent, we need to develop in our students new research skills for collection and organization, new ways of content delivery, and new ways to work together. More important, the concepts behind these new methods need to be understood by faculty before students, who often have a leg up through past experience. Active Learning, and Project Based Learning are expressions of more basic concepts of Piagetian Constructivism, Vygotskian Social Constructivism, along with extensions of these ideas such as Papert's Constructionism and social-based learning of

Paulo Freire and Ivan Illich. I leave it to the reader to fill in the background here, as space does not permit, while we maintain a focus here on the application of these to a university based EFL degree program and its final culminating research activity and alternatives to the graduation thesis.

What Is the Graduation Thesis?

The graduate thesis is often used for a Master's degree, but is sometimes interchangeable with a Dissertation, which is often applied to studies at the Doctoral level (Ph. D.). Undergraduate theses are less common. In many English speaking countries, no thesis is required as a general requirement for graduation, relying more on in-course research, which may be called papers, term papers, or essays.

However, at some selective colleges or universities, undergraduate theses are part of the requirements, or are optional as a way to get special distinction such as honors or cum laude. These can be called Senior Theses, or Senior Projects. Undergraduate theses usually do not require a contribution of new knowledge to the domain being studied. They can be an overview of the area studied, and are not usually orally defended nor used an examination as a prerequisite. Extended essays for the International Baccalaureate programs may or may not include research as a component.

Paltridge (2002) categorized theses into four types; traditional-simple; traditional-complex; topic-based; and compilation of research articles. Traditional theses treated either a single study (simple) or multiple studies (complex) in a traditional format of IMRD, or Introduction, Methods, Results and Discussion. A Topic-based thesis lacks separate Results and Discussion sections. The final type is simply a collection and summary of a number of publications on a certain topic.

Yamada (2013) finds ample research on the format and types of dissertations and theses in English. "However, to my knowledge, the undergraduate theses which are written in Japanese have not yet been studied, even though Japanese is the dominant language used for written academic texts, including the graduation theses, in Japan."

In an attempt to remedy this, she conducted a survey of Japanese graduation theses. "Copies of the graduation theses of the 10 Japanese undergraduate students were collected.... The students' theses ranged from 20,000 to 31,000 characters (approximately 12.5 to 20 A4 pages) and were within the required character limits." (Yamada, 2013)

She found that "The most common thesis type was the traditional type, which contains reports of one or more studies and the IMRD [Introduction, Methods, Results, Discussion] type structure." (Yamada, 2013)

This has not always been the case. For theses on a global level, a temporal change, observed in the 1990's, has been accelerating since then. "Thus, in some areas of study, theses and dissertations may be theorised, researched and written up, in quite different ways

from how they might have been in the past (Noble, 1994; Goodchild & Miller, 1997)." (Paltridge, 2002)

Here in Japan, the assumption is that each mentor of a thesis seminar will have their own standards. These are made explicit and evaluated at the end of the seminar period. If there is any university-wide standard, it is normally very vague, but may encompass a specific length, such as a minimum number of words or pages.

Whether a thesis includes data collection and experimental methodology or not, the primary purpose of most undergraduate theses is to display knowledge of a certain field of study, a domain of knowledge. Students are asked to collect, organize, draft and revise a summary of ideas, concepts, thoughts, research and opinions on one topic.

The Guardian notes in a survey about undergraduate theses (dissertations in the UK), that ¾ of the respondents did not think the end of this practice was imminent. (Healey, 2011)

> "For the last half century or more the final year undergraduate dissertation, typically an 8–10,000 word independent project, has been seen as the gold standard for British higher education. However, it is coming under pressure for reform as student participation rates have increased, the number studying professional disciplines has grown, and staff-student ratios have deteriorated. Some courses have abandoned the dissertation altogether, but there is a danger of throwing the baby out with the bath water. Rethinking the dissertation involves thinking creatively. How can the most important learning outcomes associated with the traditional final year project largely be retained, while giving students a range of other benefits which are more relevant to their interests and future careers?"

The Graduation Thesis: Insufficient and Outmoded

Technology, and especially Information Technology, have worked to change the world in many ways. Banking, music, publishing, and more recently, medicine and business have all been "disrupted" by technology, forcing huge changes in the way they function. Education is often seen as one of the last industries to adapt. George Landow (2006) commenting about a conference he attended in the 1990's: "It took only twenty-five years for the overhead projector to make it from the bowling alley to the classroom. I'm optimistic about academic computing; I've begun to see computers in bowling alleys."

And yet, we are seeing large changes finally coming to learning, and to education. Technology is only one impetus for educators to look at learning with a new view. Medicine, psychology, even economics have all leant new ideas to pedagogy. We are now seeing movements like Active Learning and Project Based Learning gain in adherents and proof of effectiveness through research.

"In the six month period between January and June 2015, $2.51 billion was invested in learning technology companies across the globe. This is astonishing considering that the

total global investments made to learning technology companies for the entire year of 2014 was $2.42 billion, which set a record in the industry." (Adkins, 2015) Eight of the top 13 companies receiving a total of more than a billion dollars were from China, 5 from the US, and 1 from Brazil. This is a conservative estimate, with others ranging up to 10 billion dollars this year for the US alone.

To prepare our students for this new world, we need to use these new tools to build basic skills that have been goals of pre-digital literacy, such as reading, writing, and mathematics. The graduation thesis is very well fitted at testing student ability to understand, comprehend, analyze, assimilate, organize and display knowledge in a standard format that can be used by others to expand on the domain of knowledge studied.

Research and Authorship Are Changing

The problem is that both the process and product of research and intellectual inquiry have changed, so that the graduation thesis no longer represents a complete, nor sometimes even a useful, approach to learning.

Working Alone: The single scholar in the ivory tower is no longer valued. "Worldwide, more than half of all articles were coauthored [36] in 1999 compared with 37 percent in 1986....more than one-third of co-authored articles were internationally coauthored." The proportion of collaborative research has only gone up since 2002, both domestically and internationally. (National Science Board, 2002). Co-authoring now includes growth, "...team sizes have nearly doubled, from 1.9 to 3.5 authors per paper and 1.7 to 2.3 inventors per patent." (Hurley et al., 2013). This is mirrored in the humanities, albeit with a lag in uptake.

Intertextuality: Barthes' concept of intertextuality, or "texts as networks of associations with other texts" (Diakopoulos et al., 2007) is achieved in most research through citations and a bibliography. While still part of cited research in academic journals, most intertextuality today is achieved through a link created in HTML, the code of the World Wide Web.

Tools: Most researchers today use software tools to aid in collection and organization of information. Everyday collection on Evernote, for example, has replaced index cards. Use of Zotero, Mendeley, or Tinderbox are examples of research authoring software that accompanies the producer every step of the way. All of these tools allow for collaboration and sharing.

Economics: Open Access (OA) journals are an alternative to monopolistic journals which publish material without payment to the authors and charge exorbitant amounts to libraries and other institutions, all the while maintaining copyright. Creative Commons licenses allow for the author to have control of her content, in ways that are not possible with traditional copyright. Elsevier, a traditional publisher, has created some Open Access journals, but charges the author for inclusion, even though it is peer reviewed. The process of Open Access publication is becoming increasingly popular among scholars in all fields.

Enhancements, Not Alternatives

The place and usefulness of the graduation thesis is not in question here. It serves a purpose that is important and laudable. For scholarship today, though, we find it only one star in the constellation of possible graduation activities.

> "The dissertation has a long life yet. However, if it is to remain strong and vibrant and continue to provide a transformational experience for most students then it needs to evolve and become more flexible. We need to recognise that not all students want the same things from their degree programmes and that a choice of alternative or additional formats, experiences and outputs is desirable. Furthermore, the nature and form of these choices will rightly vary across disciplinary, interdisciplinary and professional settings." (Healey, 2011)

Graduation Projects (often called Capstone Projects) have been a part of education for a long time, but mostly in the arts. They are now spreading to other areas, such as scientific domains, as well as humanities. Undergraduate Projects in the English Department at Harvard University are becoming increasingly popular as an alternative to a research paper.

The main advantage of Projects is that they are not defined, not standardized. Quality and make-up depend on the domain of knowledge, the pedagogical approach, the interests of the student and the standard forms of presentation in that domain. They might include creating a video, writing a series of blog posts, writing and maintaining a Wikipedia article, case studies, poetry, a web-based resource or portfolio, just to mention a few for humanities or linguistics.

Projects are flexible enough to allow for group collaboration, and delivery in different media. Selection by the student allows agency, which promotes motivation. It is not limited to linear thinking and delivery. It is active and constructivist, and is more often published. This last is an important distinction.

A thesis' structure is imposed, top-down, teacher-guided, linear, and rule-based and usually individual. A thesis does not develop autonomous learning skills to the degree a project does because so many of the decisions are left out of the student's hands. The changing needs for productive, happy, thinking adults in today's society mean that a new set of skills are needed on top of the ones learned in a thesis.

Project Based Learning and Meta Skills

Project Based Learning (PBL) and Graduation Projects work better with some fundamental background assumptions. Development of curricula and Projects for and with students depends on goals that are different from theses. One of the goals of a thesis is to show mastery of a domain of knowledge. While these are important, projects focus more on development of skills and literacies.

Content Is the MacGuffin

Stephen Downes is a co-creator of the first MOOC, *Connectionism and Connected Learning* in 2008, in which I had the pleasure of participating. Connectionism is a new approach to learning that emphasizes the connections among the content, and among the learners, as being as valuable as the content itself. As such, development of skills, competencies and meta-skills are the goals of this approach, and content takes a back seat.

Alfred Hitchcock, the film director famous for horror and mysteries, explained a McGuffin, or MacGuffin, as a plot device without content or meaning. It is the focus of the plot, the "thing" that the characters are all pursuing, but for the audience, has no value or interest. Probably best encapsulated by Mike Springer (2013) "Perhaps the most important thing to remember about the MacGuffin is that it contains the word "guff," which means a load of nonsense." Visit the web page and watch the 2-minute video for a visual explanation. Downes uses the idea of a MacGuffin in learning.

> "It's an approach that emphasizes open learning and learner autonomy. It's an approach that argues that course content is merely a tool employed to stimulate and support learning—a McGuffin, as I've called it in various presentations, 'a plot element that catches the viewers attention or drives the plot of a work of fiction'—rather than the object of learning itself. It's an approach that promotes a pedagogy of learning by engagement and activity within an authentic learning community—a community of practitioners, where people practice the discipline, rather than merely just talk about it." (Downes, 2010)

This makes sense in a world where everyone has the sum of human knowledge in the palm of their hand. This may be an exaggeration for a smartphone connected to Google, but we are fast approaching this ideal. No longer are we in an information poor environment, where one has to spend hours in a library basement among musty stacks to winnow out that last detail on a topic of esoteric import. We can do esoteric. The Long Tail of education allows us access to topics of interest to only a few scholars (the end of the power-law tail in a distribution of popularity of related topics). We now have the opposite problem, and with it a new set of skills; filtering and evaluating the glut of information at our fingertips. This type of skill is a good example of one that can be applied across domains, so that new content can be treated by the skill, without mastery. Employing these skills will allow the student to choose which bits of content are worthy of her attention.

John Seely Brown, speaking at a conference in Aspen, set the stage in 2002: "People don't learn to become physicists by memorizing formulas; rather it's the implicit practices that matter most. Indeed, knowing only the explicit, mouthing the formulas, is exactly what gives an outsider away. Insiders know more. By coming to inhabit the relevant community, they get to know not just the "standard" answers, but the real questions, sensibilities, and aesthetics, and why they matter."

Jesse Stommel at Hybrid Pedagogy (2015) and creator of the ground-breaking Coursera MOOC *Shakespeare in Community*, agrees. "Learning is at direct odds with content. In fact, learning does battle with content. If content wins, learning loses. We do, instead, in the best learning environments, grapple with content—we kill it on the road when we meet it there."

The only meta-skill that studies have shown to require an intimate knowledge of a domain would be critical thinking. "Unfortunately, metacognitive strategies can only take you so far. Although they suggest what you ought to do, they don't provide the knowledge necessary to implement the strategy." (Willingham, 2007) Then again, if you look at domain knowledge as a prerequisite for practice, the content is still serving the development of the skill, in this case, critical thinking.

Networks and Groups

As we work our way toward small group work, an element often used in PBL and Active Learning, it would do us well to consider a further evolution, one that considers network learning, a staple of Connectivists and Connectivist MOOCs (or cMOOCs) as a model of interaction for students. Group work functions well for Cooperative tasks, assigned by the authority (teacher), but works less well with Collaborative tasks, where the members of the team choose each task at hand. Groups inherently are closed, defining and separating an US and a THEM. They rely on coordination of effort and unity, while resources flow from one source out the group; distributive.

Networks are by definition diverse, the members have autonomy to participate or not, to contribute or not, and the extent and quality of their involvement. Networks require openness, for people to share their work, and allow others to build upon it (open source). Above all, networks are connective, the links from one member to another to all others in the network can be of varying strength and quality, and are determined by the participation of the members.

Group	Network
Unity	Diversity
Coordination	Autonomy
Closed	Openness
Distributive	Connective

Adapted from Downes, 2007

Networked learning does not adapt very well to university classes. Yet it does approximate how people interact, do research and communicate with each other when there is no overlying structure imposed. This allows members to create a structure and change it on the fly as needs arise. Autonomy is combined with responsibility for motivation to succeed at the task selected by the members.

The Most Basic Tool

Programming is the writing of our generation. Where once wielding a pencil was enough, those that program create the environment for collaboration and interaction. The last of "10 Commandments" in Douglas Rushkoff's book *Program or Be Programmed* reflects the title. The fact that almost all of us now use software to create, produce and distribute our thoughts and ideas, and the fact that we do not know how that software works, means that we are hobbled by our ignorance of programming.

Yes, learning a programming language is for some a monumental task, but it does not need to be. A simpler understanding of how programs work, along with a basic knowledge of the software construction process may be sufficient for those who only wish to relinquish limited authoring power to others. It is important to realize that those who program are the true authors of our generation and future generations. The rest of us who use applications are mere readers.

> "For the person who understands code, the whole world reveals itself as a series of decisions made by planners and designers for how the rest of us should live. Not just computers, but everything from the way streets are organized in a town to the way election rules (are tilted for a purpose vote for any three candidates) begin to look like what they are: sets of rules developed to promote certain outcomes. Once the biases become apparent, anything becomes possible. The world and its many arbitrary systems can be hacked." (Rushkoff, 2009)

Rushkoff shows us ten different ways we are being manipulated by our digital environment and gives us tips to overcome them. The book is a defense against this encroachment of machine algorithms imposed on human processes, and suggests techniques for empowerment over this new medium.

This is a process for generations, and now is the time for children to learn and overtake those of us bound to paper and linear processing of ideas. The networked, multi-faceted and multi-path connection of knowledge and information requires more skills than most of us have today. Happily, learning those skills is becoming easier with the new technology.

Conclusion

Edward Thorndike, eminent psychologist and mentor of B. F. Skinner hoped in 1903 for books that did not show page 2 until readers proved they understood page 1. A decade later Thomas Edison predicted the demise of books due to his new movie projector. With each new wave of technology—radio, television, overhead projectors—the end of education as we know it was predicted by someone. Right now, we are seeing similar predictions about the Internet, and like Edison, are about "efficiency".

As educators, we are being relegated to positions of caretakers, feminized and

marginalized to an affective (and underpaid) role in education by those that hope to offload the aspects of education that are more "efficiently" done by technology. Audrey Watters (2015), speaking at the Digital Pedagogy Summer Lab at the University of Wisconsin talks about control of education and the necessity of understanding how it works, both for students, and even more for teachers. "It isn't simply that we need to resist 'robots taking our jobs,' but we need to challenge the ideologies, the systems that loath collectivity, care, and creativity, and that champion some sort of Randian individual. And I think the three strands at this event—networks, identity, and praxis—can and should be leveraged to precisely those ends."

Requiring our students to adhere to a standard format for production of a body or work of knowledge that is their own expression of their tenure and studies at the university does not prepare them for the new world of autonomous learning skills using new tools in different formats.

Thus the graduation thesis should continue as one possibility for the much broader offerings of Graduation Projects that allow for choice. It is not enough to merely offer the opportunity but as a faculty member to develop those same skills required for projects so that they are a truly viable option for the student.

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