

Accidental Composition: How the Ph.D. Machine Fails Our Students

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Abstract

Imagine spending six or more years diligently training in a particular subject to only apply for a job in an unrelated field. Most everything you know will never be used; your education remains for your own edification, locked in a dusty wardrobe of the mind. Add to this a lack of awareness of how to do your new job. This is the picture of the modern-day college composition teacher. Newly printed Ph.D.s (and sometimes Masters) apply for positions for freshmen composition with very little pedagogical training, background, or awareness of the task. For them, composition is a backup plan in the event that their preferred occupation (usually as professor in the humanities) does not pan out. Students in freshmen composition series across the United States end up paying the price for the limited pedagogical preparation that many teachers have had. These students should not have to wait five or ten years before experience teaches these instructors how to be excellent in their craft. This is a silent institutional problem of massive proportions that can—and should—be fixed. This article offers tangible solutions to the issues involved in the lack of pedagogical training of our newly minted Ph.D. students.

Keywords: composition studies, pedagogy training, Ph.D. jobs, adjunct professor, classroom preparedness, professional development

1. Introduction: The Personnel Committee

Sitting in a personnel hiring committee for potential new composition instructors may not seem like the best circumstances for writing epiphanies to occur. This was a room for judgement, not creation: a place of verdicts, not the benefit of the doubt. But there I sat with file after hopeful file in their regimented folders—alphabetized, dressed up, color-coded, uniform, and screened for completeness by dedicated administrative assistants. Everything was as it should be and all the boxes were checked: teaching statement, diversity statement, teaching evaluations, letters of recommendation, sample syllabi, and curriculum vitae. It was all there.

This hiring committee was not to be taken lightly, for within the reams of paper lay the trajectories of lives that all happened to crisscross in this one moment in a windowless conference room at the University Writing Program at AnyWhere University. This one just happened to be where I've worked as a teacher since 1996. The candidates were to be ranked on a scale using a rubric and then assigned an integer to be processed through Excel. The human machine would transform these piles of careers into clearly defined numbers. Ties would be adjudicated through discussion. Holistic impressions—honed through years of experience, expertise, and processed through Malcolm Gladwell's gut decision-making process—would be transformed from ephemeral review to mathematically concrete evaluation.

Then I came across the tenth dissertation title that gave me pause. My own translation for the work for the sake of anonymity, "The Dystopian Hegemony of Meta-stasis: The Art of Slippage in *Finnegan's Wake*", was equally as daunting as the original. What does this mean? I searched the coffer of my own graduate school experience for parcels of meaning from Derrida to Lacan to Saussure. My mental faculties strove to construct a framework for how this knowledge might work in a freshman composition class, but the erector set crumbled only seconds later.

This is not to discount literary endeavors in favor of composition theory. Anyone pursuing a study of *Finnegan's Wake* should be presented a medal for tenacity, given its demanding complexity. The same is true for hundreds of other texts that other would-be writing program candidates have investigated and discussed in the teaching statements that I have reviewed.

Careful literary analysis and a wide base of consumed literature can be a key component for background knowledge of any composition instructor. Literature can, at times, be a great resource for classroom instruction, paving the way for meaningful and fruitful discussions. But three questions came to mind after examining these thinly veiled dissertation montages masquerading as teaching statements: 1) how do these connect to freshman composition? 2) where are the knowledge, experience, and craft of pedagogy that will serve the freshmen and sophomore students who need help honing their own reading/writing skills? 3) how were these candidates to scaffold, frontload, or assess meaningful work in a classroom with any of the material they spent so many years studying?

2. The Ideal Career for English Ph.D.s

The apparent disjunction in applications between would-be scholars and conscripted composition instructors surely lies with the assumed trajectory of most English Ph.D.s, and the disparity begins long before the first CV or cover letter is mailed out to prospective employers. For most of us, graduate school left such an indelible mark on our psyches, physically changing how our brains are organized on a neuroplastic level (Carr, 2010; Skorheim, 2014). And if we ransack the treasury of our seminar experiences, it's easy to remember the intense pressure to secure a traditional, tenure-track literature position in an acclaimed college. Anything less is tantamount to registering as a permanent resident of Skid Row. It isn't the same for everyone, of course. Newly matriculated masters' students seem relatively unaware of job pressure because they so often seem assured that they, unlike so many others, will have the literary career, the publishing accolades, the success at major conferences. The dream exists in a future far, far away, like the distant scrolling words in a Star Wars epic: "In a galaxy far, far away...." A multitude of masters' seminars, Ph.D. courses, exams, and a thesis lie between the now and the then for these students.

For some of us, the memory of graduate school has faded into the mist, yet we need only look at the increased professionalization of CVs themselves: conference presentations, publications in graduate or "real" journals, guest speaking engagements, and for some, a dissertation converted into a book—all of this accomplished while *still in* graduate school. Most of the CVs that cross the threshold for the few composition jobs at UC Riverside show a plethora of experience of the literary-scholar-in-training type. Becoming a professor in a university English department is the objective *par excellence*; anything else is coming up short.

But as many graduate students eventually find out, the tenure track job search is often a heart-wrenching journey through drought and desert, with only the whispered stories of those who succeeded. Indeed, the job market for humanities graduates, long in decline, has not dramatically improved in many years. According to the Modern Language Association's own statistics, PhDs pursuing tenure track positions have less than a 50% chance of landing a tenure track position (Research, 2011). David Colander and Daisy Zhuo further refine these statistics, indicating that Ph.D. students in top-10 English programs in the United States have a good chance of securing a tenured position, students from lower ranking programs have virtually no chance (Colander & Zhuo, 2015). What happens to the massive surplus of PhDs that accumulate, like layers of sedimentary rock, in the job market? They look for whatever job they can find. These things are known in the field.

3. The Proof Is in the Letters

The disjunction between the preparation for research-based jobs and actual composition positions leads to a type of job-hunting multiple personality disorder. Candidates desire elite positions, but they are realistic enough to understand the odds of winning the lottery are pretty slim. Thus, they turn to the rhetorical precision of the cover letter/teaching statement.

There are three main kinds of letters of recommendation that correspond, quite closely, to three types of teaching statements. There is the professional, tenure track letter. The thesis advisor is dutifully tapped to formulate a creative way to describe the candidate's remarkable thesis project. They recommend, strongly recommend, without hesitation recommend the budding and inventive pupating scholar. As is often the case, such recommendations echo, like a ghost in the machine, the candidate teaching statements themselves where so much time and space are spent on their dissertation, on the theories that were used, on the resources that were summoned. In so many ways this is like the analysis of a long fought battle between the herculean forces of entropy and will power.

The problem is that these encomiums to literary criticism and theory should have been prepared for a different job, a professorship of literature, not a composition position. It's evident from reading such letters that the composition job at AnyWhere University, one that I esteem greatly, is in many cases only a distant safety

school—a fallback position in the event that the dream of literary scholarship turns out to be a mirage in the Desert.

In the middle lie the recommendations and teaching statements that do both. These are the multi-use tools of the job-hunting trade, like a prized Leatherman knife. You never know when you need a saw, a spoon, a knife, a literature position, or a comp job. Recommenders often spend half the letter extolling the research virtues of the candidate while commenting how they worked as a teaching assistant throughout graduate school. These teaching statements require sophisticated balancing between research and teaching practice, which focuses mainly on the breadth and amount of teaching experience, not on pedagogy itself.

At the other end of the spectrum lie the pure teaching packages. These are often aimed squarely at the community college market. Dissertations, if they are completed at all, are marginalized to a few lines of text. Years of effort become a few verbs, some nouns, a couple phrases, and some fancy punctuation. The concentration here, especially in the teaching statement, is on the number of classes taught and the typical assignments offered in such courses. These are the instructors, ready for the proverbial 3AM call, to teach *any type* of composition class *that same morning*. These statements tend to be descriptive in nature, with a notable lack of a coherent pedagogy theory.

All three types of recommendations and teaching statements, some remarkable and others pedestrian, may mention what classes the candidate taught along with a description of the number of assignments. But I have seen so many files over the years that seem lost somewhere between elite professor position and adjunct community college hopeful. As with many job seekers, the rhetorical need to please potential committee personnel is palpable, but ironically the most important questions are often left unanswered: What do you do in your classroom? What is the theoretical background you use? How do you scaffold assignments? How do you engage in professional development of your pedagogy? The list of questions goes on and on, and approximately 70% of the files that I have seen leave these questions unanswered. Thankfully, some superb candidates do make it through, and I have had the privilege of working with many of them. But what of the rest?

4. The Ph.D. Teacher Myth

One of the files in the mound sitting before us on the conference room table came from a promising Writing-Across-the-Curriculum (WAC) candidate: a Ph.D. in Bio-chemistry. Contrary to what one may assume about non-English personnel, WAC has not watered down the instructional pool in the least. Instead, it has actually helped by enlarging the parameters of experience and background for those who are hired while forcing Writing Program Committee members to look closely at the teaching statements and listed experience. This particular Ph.D. thoroughly explained his own dissertation on some topic like potassium channel interactions at the cellular level. He attempted to bridge the chasm of science and pedagogy through a few paragraphs that described how he imbedded science into the classes he taught as a teaching assistant. Unfortunately, the more I read, the more it felt like a scientific version of *Finnegan's Wake*, writ large in strange chemical symbols and equations.

A Ph.D. in Bio-chemistry, History, Political Science, or English does not automatically equate into an ability to teach others to read critically or write well. Why should it? While the more humanistic fields, especially English, may indicate a better writing ability of the candidate and more transferable skills to the classroom, *it doesn't directly equate* to the composition classroom without some sort of training or analysis. Why do we assume so easily the transfer of writing skill to teaching task? How is this transfer learned? This is an outdated notion of behaviorism that even B. F. Skinner felt necessary to revise and refine (Skinner, 1983, 1985). Instead, educational theory developments since the early 1970s have focused on the increasing role of the learner in creating schemas, cognitive coding mechanisms, and more recently with constructivist-centered classrooms. This indicates a clear value in knowing educational theory (Dole, Nokes, & Drits, 2009; D. A. Kolb, 2007; Paas, van Gog, & Sweller, 2010; Yilmaz, 2008).

Is this terminology just a bunch of words meant to distract, confuse, and alienate teachers and privilege theoreticians or do they actually mean something? There are, after all, plenty of articles in the ERIC database published by professors in Education programs that do just that. These, too, often read like *Finnegan's Wake*. These, too, often read like *Finnegan's Wake* in their complexity. And then take out the parenthesis?

Yet, how can teachers be truly great if they don't know what they are doing or why? Brilliant teaching *can happen* with those who don't have formal educational training; perhaps they internalized methodology or have an innate ability to process information and then setup a classroom dynamic where learners engage with it. This is the typical process that takes place over a long period of time: experienced composition instructors who have

had no formal pedagogical training often acquire this facility after five or ten years of service, but they may still be unable to formulate a coherent theoretical framework that comprehends and utilizes the terminology of the field.

But who can? As a Teacher Consultant for the Inland Area Writing Project (an affiliate of the California and National Writing Projects), I have come into contact with hundreds of primary and secondary teachers. I have had the privilege of learning kinesthetic teaching strategies from second-grade teachers or concentrating on rubric forming activities with high school teachers or being exposed to new ways of parsing texts from middle school instructors. What these teachers all had in common was a deep understanding of pedagogy. They knew what they were teaching, why, and how to set it up. Part of this is surely due to the requirements of the credential courses they have taken: a year of seminar and practicum courses dedicated to modes of learning, cognitive structures, and classroom management. Add to this list the frequent requirement for teachers to formulate weekly lesson plans, complete with setup, objectives, and assessment protocols, and all this sort of background is bound to impact the classroom.

In our own college composition classrooms, there seems to be a tradeoff. College-level instructors frequently have more subject-matter knowledge than primary or secondary instructors but lack the background in pedagogy. I speak from experience in this. I first started teaching with my M.A. and Ph.D. in medieval and renaissance literature in hand. To be sure, I had a great deal of subject-matter awareness. I could give an impromptu lecture on the social dynamics of the interactions of Chaucer's Canterbury pilgrims. I could discuss the placement of Shakespeare's Globe outside the official confines of London near the site where leper colonies were exiled. Name a Shakespeare play, I could tell you when it was written and provide a plot summary and some critical literature references. But this knowledge did not directly transfer to the composition classroom where I was tasked to teach students tangible writing skills: how to write in certain genres (profile, expository/concept, remembered event, remembered person, argumentative, analysis, solution); how to edit and proofread their material (phrases, clauses, sentence types, parsing); how to conduct research (evaluation of sources, surveys, interviews). This is not to say the process of completing a Ph.D. does not assist with the concomitant background knowledge, for I remember being on a first-name basis with all the reference librarians. The process of completing an advanced degree hones a candidate's skills in critical thinking, writing, and changes them in profound ways.

Despite the Ph.D., I wasn't an excellent composition instructor when I first began. It was primarily through an apprenticeship program and a few mandatory (brief) pedagogy classes that I attended as a first-year teaching assistant that I developed a sense of classroom management and assignment design. It was really through two subsequent Masters' degrees (a Master's Degree in Education and a Master's Degree in Science, Instructional Design and Technology) where I truly learned what I should have known before.

Both these degrees included required seminars on the history of education, assignment design, pacing, and a host of other issues that I have encountered in my twenty years of teaching. Few and far between have been the times when I could trot out Beowulf or discuss the Great Vowel Shift or list some of the secondary critical sources that I used to know so well. There has been some transfer, of course. My literary background definitely informs my teaching and provides for richer context, especially with assigned literature. The interpretive/analytical skills as well as the connective tissue of one literary genre to another all make for a richer classroom. But far more important has been the knowledge of how students learn (D. Kolb, 2006; D. A. Kolb, 2007), different modes of assessment such as formative or summative (Eberlein, Ludwig, & Nafziger, 2011; Evans & Waring, 2011; Yourstone, Krave, & Albaum, 2010), pacing, rubric uses (Hillocks, 1995), reading process (Freund, Kopak, & O'Brien, 2016). The history of education courses, for instance, helped me in the online courses I teach in order to avoid replicating the errors of the past by duplicating mastery learning batteries, and, instead, creating a constructivist community within the bounds of the course (Henson, 2015; Taber, 2016).

Too often there is simultaneously a reverence toward college instructors by those in primary or secondary education and an unfortunate condescension by instructors in the post-secondary field. Perhaps this is why K-12 teachers in the Writing Project so often seem surprised that I want to learn just as much from them as they do from me. It's not false humility; it's the truth. And if they only knew how much in need many post-secondary instructors really are in the art of pedagogy...

5. Lack of Continual Professional Development

The necessary professional development of post-secondary composition teachers is unlikely to take place due to a lack of awareness of the problem, a dearth of funding for continued growth, or the wrong type of professional development. This is the cycle I have seen unfold many times. Newly minted Ph.D.s with a few years of TA

training apply for composition jobs (as the primary or the backup plan) even though all their training is typically in some literary field. If they find a full-time job, that institution is unlikely to have a coherent professional development mechanism available to them. Unlike primary and secondary schools that have days upon days of professional development mandated every year for their teachers, colleges and universities most often have nothing. If instructors desire to grow, it's all done on their own. And even here, what does this personalized professional development look like? It might even include the presentation at a literary conference (MLA/PAMLA, etc.), or a presentation at the CCCCs for the truly dedicated. The effort is so often left to the individual to cobble together professional development without much institutional support.

It seems like a grim picture, painted with shades of dark ash and punctuated by “woe to the field”. This is not the case. Over my tenure at UC Riverside, I have met a number of superlative teachers both in my own writing program and those who teach at other campuses, but most of them became great through years of experience and a dedication to the craft. There was not a great deal of institutional funding for their professional development; it's only what they could put together in the midst of their busy teaching schedules.

So let me take this opportunity to break the fourth wall. Who among your own colleagues do you consider to be great teachers? How did they become that way? Do they regularly read books on pedagogy or did they come to your institution already issued with a rhetoric/composition degree or some required education classes in tow? Do your conversations about teaching reach to the craft of the classroom or do they remain at the level of complaints about less-than-diligent students? It's a sobering thought.

Having conducted many teaching observations in my career, I can attest that years of experience certainly have a leavening effect on teachers. The newer the Ph.D., the more likely the class will look like a miniature graduate seminar in literature, with the teacher doing most of the lecturing. More experienced teachers typically start introducing substantive peer critiques (i.e., frontloaded so that they are actually valuable); they often turn to project-based learning and other forms of authentic assessment; they use rubric activities to critically engage their students on multiple levels (Hillocks, 1995). In their classrooms students are *doing something, learning skills, presenting* material. Ph.D.s with no pedagogical training often—not always—enter the classroom, ready to lecture with a see-what-I-know attitude; those with some education training and/or experience set the framework in the class so students help create their own knowledge systems (constructivism). These are not just words; they are the philosophical underpinnings for how students process, absorb, and eventually use (or not) information.

6. Relearning How to Teach

Great pedagogy is not simply about preparing materials, conducting classes, and teaching courses, nor is it about the sheer amount of background knowledge a teacher possesses. What is offered in a course is merely the end result of a complex, recursive process that begins with the central stance that great teaching must be based on inquiry and reflective practice. The message is simple: teachers work within “communities to generate local knowledge, envision and theorize their practice, and interpret and interrogate the theory and research of others” (Cochran-Smith & Lytle, 2001). All good things flow from the stance of the reflective practitioner, which is far removed from a top-down model of listening to an education expert, absorbing some new terms, and then applying the theory. A reflective practitioner strives to share this knowledge with others and invite constructive criticism (Dana & Yendol-Hoppey, 2014). This is the attitude where no class is ever flawless; there is always room for improvement through continually reading subject matter material and pedagogy theory. The process can be broken down into seven steps.

Step 1: Reflecting on one's practice by studying student work outcomes

Step 2: Developing questions about one's instructional approaches or needs

Step 3. Examining relevant educational theory

Step 4. Integrating new ideas based on pedagogical theory (in individual lessons)

Step 5. Applying new approaches/strategies in the curriculum (across a course)

Step 6. Sharing results with the teaching community (department meetings, conferences, publishing, etc.)

Step 7. Inviting constructive feedback from students and colleagues

These steps provide a blueprint to create connections among students, colleagues, and policy makers. It is a recursive process that allows first-year teachers to share their experiences and thirty-year veterans to continue to grow. It is the ultimate form of differentiated instruction for instructors themselves.

Ideally, all college composition programs—like primary or secondary schools—should require a teaching credential of all prospective applicants, but this level of institutional change is hard to implement overnight. At most, job announcements might include a “desired” category for instructors with a background in educational courses. Instead, a few substantive tweaks in programs can initiate profound transformations. Here is a fifteen-step recovery process to rehabilitate and strengthen composition programs; these are some of the steps my own program has initiated and has been engaged in.

- 1) Remove from our mentality the idea that every assignment works; we need to admit when something doesn't work and examine how to fix it.
- 2) Abandon the idea of “best” teaching practices; we must have a growth mindset.
- 3) Establish a mentorship program for new teaching assistants, lecturers, professors.
- 4) Create a grading handbook (sample student essays, graded).
- 5) Petition administration for professional development in order to create opportunities for systematic and continue improvement.
- 6) Establish teaching observations as a systematic component (without any negative impact—only for potential teaching discussion), i.e., attend and provide one teaching observation per quarter; learn from each other.
- 7) Engage in routine norming discussions for grades by consulting “live” student work.
- 8) Formulate active inquiry groups within the department where instructors meet to discuss particular pedagogy texts and/or classroom issues without the baggage of complaints.
- 9) Exchange leadership roles when warranted through a shared leadership model. We lead when it's necessary and retreat when not.
- 10) Nudge prospective leaders and invite them into the fold by giving them increasing levels of responsibility.
- 11) Disseminate presentation or publishing opportunities that can help spread and develop the expertise of the teaching community.
- 12) Provide ways for teachers to assume the role of students, so they can see how assignments actually work. It also gives them a greater empathy for their own students and the struggles they have.
- 13) Create a program survey to see what instructors need, what their difficulties are, what professional development program they want, and what suggestions they might have (i.e., shared governance).
- 14) Streamline program orientations so that more time is spent on discussions of teaching rather than policies (these can be had in a handbook or YouTube video posted only for the school).
- 15) Create an online forum (monitored and maintained by somebody) where student papers can be posted, information readily disseminated, discussion boards, etc.

Far from being an afterthought, college composition courses are seminal to the development of the student population (Yood, 2016). They are one of the last times that many students will have an instructor so thoroughly evaluate their writing, provide constructive criticism, and create a classroom structure to hone their reading and writing skills. We owe them a well-prepared cadre of instructors who have more than subject-matter training; we owe them educators who are dedicated to continuous improvement through inquiry. This, after all, is what I would like to see in the upcoming group of job applicants for my own university; and our institutions ought to provide the support and structure for the continued growth of these instructors.

In the current system, newly hired composition instructors so often become atomized, a collection of electrons buzzing to and fro, with a propensity to stay in their own shell orbits. And because of their educational training—or lack thereof—they may also feel fearful about approaching anyone for help. Help. No, no, no. This is a weakness that they dare not show to anyone in their new program. Thus, it is not only disjunction between graduate school curriculum and the composition job market that is to blame for today's state of affairs; it is also composition programs that so often do not have an institutional structure to help, guide, and promote the newly hired talent. This is directly reflective of a larger institutional crisis that has been ongoing for some time now (Lay, 2012). We don't need a field where composition instruction happens by accident. We need to graduate to a full-fledged profession, for that is what it is.

References

- Carr, N. (2010). *The Shallows*. New York: W. W. Norton & Company, Inc.
- Cochran-Smith, M., & Lytle, S. L. (2001). In A. Liberman, & L. Miller (Eds.), *Teachers Caught in the Action: Professional Development That Matters* (pp. 45-58). New York & London: Teachers College, Columbia University.
- Colander, D., & Zhuo, D. (2015). Where Do PhDs in English Get Jobs?: An Economist's View of the English PhD Market. *Pedagogy*, 15(1), 139-156. <https://doi.org/10.1215/15314200-2799276>
- Dana, N. F., & Yendol-Hoppey, D. (2014). *The Reflective Educator's Guide to Classroom Research*. The United States: Sage Publications.
- Dole, J. A., Nokes, J. D., & Drits, D. (2009). Cognitive Strategy Instruction. In S. E. Israel, & G. G. Duffy (Eds.), *Handbook of Research on Reading Comprehension* (pp. 347-372). New York: Routledge.
- Eberlein, M., Ludwig, S., & Nafziger, J. (2011). The Effects of Feedback on Self-Assessment. *Bulletin of Economic Research*, 63(2), 177-199. <https://doi.org/10.1111/j.1467-8586.2009.00345.x>
- Evans, C., & Waring, M. (2011). Student Teacher Assessment Feedback Preferences: The Influence of Cognitive Styles and Gender. *Learning and Individual Differences*, 21(3), 271-280. <https://doi.org/10.1016/j.lindif.2010.11.011>
- Freund, L., Kopak, R., & O'Brien, H. (2016). The Effects of Textual Environment on Reading Comprehension: Implications for Searching as Learning. *Journal of Information Science*, 42, 79-93. <https://doi.org/10.1177/0165551515614472>
- Henson, K. T. (2015). *Curriculum Planning: Integrating Multiculturalism, Constructivism, and Education Reform* (5th ed.). Long Grove: Waveland Press, Inc.
- Hillocks, G. (1995). *Teaching Writing as Reflective Practice/George Hillocks, Jr.* New York: Teachers College Press.
- Kolb, D. (2006). *Kolb learning style inventory: Version 3.1*. [S.l.]: Hay Resources Direct.
- Kolb, D. A. (2007). *The Kolb Learning Style Inventory*. Boston, Mass.: Hay Resources Direct.
- Lay, E. D. J. R. (Ed.). (2012). *Who Speaks for Writing: Stewardship in Writing Studies in the 21st Century*. New York: Peter Lang Publishing.
- Paas, F., van Gog, T., & Sweller, J. (2010). Cognitive Load Theory: New Conceptualizations, Specifications, and Integrated Research Perspectives. *Educational Psychology Review*, 22(2), 115-121. <https://doi.org/10.1007/s10648-010-9133-8>
- Research, M. O. (2011). *MLA Survey of Placement of 2006-07 Graduates from Doctoral Programs in the United States and Canada* (pp. 1-10). Modern Language Association.
- Skinner, B. F. (1983). Intellectual Self-Management in Old Age. *American Psychologist*, 38(3), 238-239. <https://doi.org/10.1037/0003-066X.38.3.239>
- Skinner, B. F. (1985). Cognitive Science and Behaviourism. *British Journal of Psychology*, 76(3), 291-301. <https://doi.org/10.1111/j.2044-8295.1985.tb01953.x>
- Skorheim, S. W. (2014). *An exploration of the role of cellular neuroplasticity in large scale models of biological neural networks*. Ph.D., University of California.
- Taber, K. S. (2016). Constructivism in Education: Interpretations and Criticisms from Science Education. In E. Railean, G. Walker, A. Elci, & L. Jackson (Eds.), *Handbook of Research on Applied Learning Theory and Design in Modern Education* (pp. 116-144). Hershey, PA: IGI Global.
- Yilmaz, K. (2008). Constructivism: Its Theoretical Underpinnings, Variations, and Implications for Classroom Instruction. *Educational Horizons*, 86(3), 161-172.
- Yood, J. (2016). *From Crisis to Composition*. Retrieved from <https://www.insidehighered.com/views/2016/03/11/importance-general-composition-courses-essay>
- Yourstone, S. A., Krave, H. S., & Albaum, G. (2010). Online Quantitative-based Assignments—Are More Attempts Better for Learning? *Decision Sciences Journal of Innovative Education*, 8(2), 347-351. <https://doi.org/10.1111/j.1540-4609.2010.00260.x>

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