

## The Theory-to-Practice ePortfolio: An Assignment to Facilitate Motivation and Higher Order Thinking

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Instructors often use ePortfolios to facilitate deeper learning by providing an outlet for reflection, analysis, integrative thinking, and transfer of learning (Buyarski et al., 2015; Reynolds & Patton, 2014). In line with these objectives, I sought out to deepen learning and motivation on a required, semester-long assignment in an introductory educational psychology course for preservice teachers that is linked to a practicum experience. The original assignment was a template in Microsoft Word in which students included a summary of each major theory learned in class, provided a teaching example, and wrote a reflection about each topic. The new assignment is titled the Theory-to-Practice (T2P) ePortfolio, given that the focus of the assignment was to serve as a venue through which students developed an understanding of how the theories they learned in class connected meaningfully to teaching and influenced their teaching philosophy. Thus, the assignment served as a portfolio of this development. Independent samples t tests revealed that students' perceptions of usefulness in the course were significantly higher in the intervention groups and that ePortfolio assignment grades were significantly higher in the intervention groups. The assignment rubrics included dimensions from AAC&U VALUE rubrics measuring integrative learning, critical thinking, analysis, and written communication. The change in assignment format was positively associated with deeper learning on the assignment and perceived value in the larger course experience.

ePortfolio is purported to function as a vessel for integrative and deeper learning (Reynolds & Patton, 2014) by providing a technological means through which those processes can be achieved that may not otherwise be facilitated through paper-based or word-processed assignments (Labissiere & Reynolds, 2004). Others have highlighted the need for instructors in higher education to incorporate and appropriately assess assignments designed to facilitate higher order thinking (Sullivan & McConnell, 2017). Moreover, not only does it seem timely to integrate such tools into one's practice to affect student outcomes but also it is important to study empirically the impact of one's efforts. Although the field of ePortfolio has a growing foundation in peer-reviewed literature dating back to the early 2000s, a minority of the publications has focused on empirically measuring student outcomes (Bryant & Chittum, 2013; Chittum, 2016). Most of the peer-reviewed publications are descriptive in nature or investigate student and/or faculty perceptions and affect associated with ePortfolio rather than how ePortfolio has supported students in the learning environment on a variety of important outcomes (Bryant & Chittum, 2013; Chittum, 2016). Thus, there is a need to develop a more robust research foundation surrounding this educational tool (Bryant & Chittum, 2013; Chittum, 2016; Rhodes, Chen, Watson, & Garrison, 2014).

The purpose of this research was to investigate the impact of altering my teaching practice in a teacher education course by reformatting a traditional Word-processed assignment into a semester-long ePortfolio assignment. To ascertain impact, I investigated students' perceptions of motivation in the course at large (not on the assignment) and their achievement on

the assignment, as measured by a rubric that primarily assessed higher order thinking processes. I chose to measure impact in these ways because my objective in revising the assignment was to impact student motivation more broadly than on a specific assignment and to deepen the thinking processes demonstrated on an assignment worth a large percentage of the course grade and considered a capstone assignment in the course. This study is one example of how an instructor can engage in the scholarship of teaching and learning (SoTL) to inform her practice and, thus, engage in a science-based instructional practice.

### **ePortfolio in Teacher Preparation**

This study concerns a course in a teacher preparation program for elementary education majors, so it is also important to consider this study in context. Research investigating the use of ePortfolios in teacher preparation programs to date has primarily focused on student perceptions of ePortfolios (Chye, Liao, & Liu, 2013; Kabilan & Khan, 2012; Contreras-Higuera, Martínez-Olmo, José Rubio-Hurtado, & Vilà-Bañós, 2016; Kecik et al., 2012; Lambe, McNair, & Smith, 2013; Milman, 2005; Ndoye & Ritzhapt, 2012; Ng, Shroff, & Lim, 2013; Ntuli, Keengwe, & Kyei-Blankson, 2009; Sarai & Sithole, 2012; Struyven, Blicke, & De Roeck, 2014; van Wyk, 2017) and/or their reflective practice as an outcome (e.g., Liu, 2017; Pelliccione & Raison, 2009; Pianpeng, & Koranekij, 2016; Thomas & Liu, 2012), with many of the ePortfolios situated program-wide as a means to assess teacher competencies. This study differs from prior research in two main ways: (a) my design of the

ePortfolio is situated in a single course, and (b) the intent was to assess the impact on learning/achievement and motivation in a course for preservice teachers. In essence, I examined how transforming an assignment focused on deepening student learning and integration of course content into practice affects student outcomes like achievement and motivation.

### Theoretical Framework

#### MUSIC Model of Motivation

One purpose of this research is to study the effect of modifying a semester-long assignment on student motivation in the course as a whole. I used the MUSIC Model of Motivation (Jones, 2009, 2015) as a theoretical framework for investigating motivation in this study. The MUSIC model was designed to support educators in developing teaching strategies consistent with motivation theory (Jones, 2009). The MUSIC model is a framework that summarizes five components of motivation that are derived from decades of research and theory: eMpowerment, Usefulness, Success, Interest, and Caring (“MUSIC” is an acronym). The main tenants of the MUSIC model are that students are motivated when (a) they believe that they are *empowered* or have some control over their educational environment, (b) they perceive that the content or tasks completed in school are *useful* to them, (c) they feel that *success* is possible if they put forth effort, (d) they perceive that what they are learning or the activities and tasks are *interesting* to them, and (e) they believe that the instructor and their peers in the classroom *care* about them (Jones, 2009).

The five components of the MUSIC Model of Motivation are not “new” concepts; they are organizing factors designed to support educators in using longstanding theories of motivation while reducing jargon, such as expectancy-value theory (Eccles et al., 1983; Wigfield & Eccles, 2000), self-determination theory (Deci & Ryan, 2000), social cognitive theory (Bandura, 1986), self-theories of intelligence and growth/fixed mindsets (Dweck, 1999), interest development theories (Hidi & Renninger, 2006), and the concept of caring (Wentzel, 1997; Noddings, 1992). Table 1 outlines the MUSIC model definitions, related motivation constructs, and associated sources.

For the *empowerment* component, college educators may provide students with autonomy (Deci & Ryan, 1991) and foster an internal locus of causality (deCharms, 1968) by offering students choices and control within the learning environment (Jones, 2009, 2015). When addressing the usefulness construct, instructional strategies may be designed to highlight

the usefulness and relevance of the content to the students’ long- and short-term goals and needs, as well as connect content and tasks to the real world outside of the classroom (Jones, 2009, 2015). To encourage success, college instructors may create environments in which students feel that they can attain success with effort (i.e., an appropriate challenge), including, for example, clear expectations, opportunities for support, and feedback that is positive, constructive, actionable, and informative (Jones, 2009, 2015). Instructors can target students’ interest perceptions by tailoring content, tasks, and activities that are, for example, engaging, enjoyable, novel, stimulating, and presented in a variety of formats (Jones, 2009). Finally, to nurture the caring component, college instructors can foster an environment in which students feel others care about their personal well-being and academic success, which can be facilitated through interpersonal interactions such as respect, tailored feedback, and accommodations (Jones, 2009, 2015).

#### Deepening Student Learning

A primary objective in my course, and of the ePortfolio assignment revision, was to deepen students’ learning processes. Thus, it is key to first define what I mean by “deepen” learning. In general, in this article, I am referring to *higher order thinking processes*, which are used in this paper as a broader term that encompasses multiple complex thought processes such as critical thinking, transfer, and problem solving (Brookhart, 2010; Halpern, 2006, 2014). Scholars have offered a variety of definitions of these terms; thus, I present definitions of critical thinking and higher order thinking that communicate my objectives in the current study. For example, Lewis and Smith (1993) explained, “higher order thinking occurs when a person takes new information and information stored in memory and interrelates and/or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations” (p. 136). Halpern (2014) similarly defined critical thinking, explaining that it is “the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal-directed” (p. 4). They elaborated further by conveying the thinking processes involved, such as problem solving (Halpern, 2006; Lewis & Smith, 1993), making inferences (Halpern, 2006), decision-making (Halpern, 2006; Lewis & Smith, 1993), formulating predictions (Halpern, 2006; Lewis & Smith, 1993), and creating or synthesizing (Lewis & Smith, 1993). Although they defined two terms (higher order thinking, critical thinking), in both definitions there is an emphasis on achieving a specific goal by

Table 1  
*The MUSIC Model of Motivation Constructs Defined With Related Constructs*

MUSIC model components	Definitions	Related constructs from previous theory and research
Empowerment	Perceived control and/or choices in the learning environment.	Autonomy (Deci & Ryan, 2000) Choice (Patall, 2012)
Usefulness	Perception that the course content or tasks/activities are useful to the student's goals or needs.	Utility value (Wigfield & Eccles, 2000; Eccles et al., 1983) Instrumentality (Miller & Brickman, 2004)
Success	Perception that success can be attained if sufficient effort is put forth.	Expectancy for success (Wigfield & Eccles, 2000) Self-efficacy (Bandura, 1986)
Interest	Perception that the course content, tasks, activities, and/or instruction are interesting.	Situational interest (Hidi & Renninger, 2006) Intrinsic interest value (Wigfield & Eccles, 2000; Eccles et al., 1983) Flow (Csikszentmihalyi, 1990)
Caring	Perceived caring in the learning environment, which includes a belief that the instructor cares about the student's success in the course and his/her personal well-being.	Caring (Noddings, 1992; Wentzel, 1997) Relatedness (Deci & Ryan, 2000)

*Note.* Adapted from Jones (2016, p. 5).

manipulating information cognitively in a more complex fashion (e.g., through the transfer of learning; Halpern, 2006). These thinking processes encompass the upper levels of Bloom's Cognitive Taxonomy, including analysis, evaluation, and synthesis (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956).

Also central to the present study are the Association of American Colleges and Universities' (AAC&U) definitions of several higher order processes in their VALUE (Valid Assessment of Learning in Undergraduate Education) rubrics (AAC&U, 2017d, 2017e), which were used to measure higher order thinking in the present study: (a) critical thinking, (b) analysis, and (c) integrative learning. AAC&U has put forth a more traditional and specific definition of *critical thinking* as "a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion" (AAC&U, 2017a, para. 2). AAC&U (2017b) defined *analysis* as "the process of breaking complex topics or issues into parts to gain a better understanding of them" (AAC&U, 2017b, para. 2). Finally, *integrative learning* is considered "an understanding and a disposition that a student builds across the curriculum and co-curriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus" (AAC&U, 2017c, para. 2).

Higher order skills such as these are considered critical in higher education. To transfer learning from one context to another, for instance, higher order thinking skills are integral. Indeed, some would argue that transfer is one of the primary purposes of higher education (Halpern & Hakel, 2003). Others suggest that critical thinking and higher order thinking skills are integral to successful professionals in the modern workplace, a need that has been established for several decades (Hunt, 1995; O'Neil, Allred, & Baker, 1997; Pillay, 2006). Hart Research Associates (2015) found that high percentages of the employers they surveyed perceived that problem solving across contexts (96%), solving complex problems (70%), critical thinking and analysis (81%), and application/transfer of learning (80%) were among the most significant learning outcomes for college students entering the workforce. In addition, on average, the surveyed employers did not find many college graduates particularly well-prepared, especially in skills like transfer of learning and critical thinking (Hart Research Associates, 2015).

### The Theory-to-Practice ePortfolio

The assignment of focus in this study was implemented in an undergraduate course for preservice teachers that concerned theories of learning, motivation,

and development, as well as planning for instruction. Thus, the course was essentially an introduction to educational psychology with a focus on applying theory and research to instructional practice. The course was “linked” to a practicum in which the students used teaching practices and assignments developed in the educational psychology course (e.g., lesson plans, behavior management procedures) during associated practicum hours in kindergarten through second grade classrooms. The assignment of focus spanned the majority of the semester, and it was designed to support students as they bridged theory and practice. Both versions of the assignment included three main elements: (a) original summaries of the major theories covered in class, (b) teaching examples that indicate how the theories apply to classroom teaching, and (c) personal stances that include reflections and judgments about each theory. The original assignment (i.e., the “Theory Chart”) was a template in Microsoft Word format, which included tables students filled in with appropriate information (Appendix A). All students (control and intervention groups) were offered in-class instructions, writing prompts and samples, and formative feedback on the first summary with an expectation that they would submit a revised version for grading.

### Revised Assignment

The revised assignment was titled the Theory-to-Practice (T2P) ePortfolio, given that the focus of the assignment was to serve as a venue through which students developed an understanding of how the theories they learned in class connected meaningfully to teaching and influenced their teaching philosophy. Thus, the T2P ePortfolio operated as a portfolio of this development and can be considered a capstone assignment. With that in mind, the primary objectives of the assignment redesign were to (a) provide an opportunity for the students to create a portfolio of their teaching experience during the semester with a focus on connecting theory to their budding instructional practice, (b) facilitate deeper thinking processes about the theories and concepts covered in class, (c) enable more meaningful connections between the content and practicum experience, and (d) make the assignment more useful to them in the future (edTPA, teaching). I wanted the assignment to be in a format more easily accessible to them in the future because the students have been known to use their Theory Charts during later semesters to assist with some course assignments, for weekly theory-focused reflections during their final internships as senior-level student teachers, and as they complete one section of the edTPA, a performance assessment all students are required to pass before they are recommended for licensure. In previous experience, the Theory Chart as a paper-based assignment has posed some issues for students attempting to use it at a later time.

Digication, an ePortfolio platform, hosted the T2P ePortfolio. Screenshots of the template and examples of student work are visible in Appendix A and Appendix B, and are an illustration of the Classic Digication platform. The following list summarizes features that the Digication platform provided that were not accessible when the assignment was formatted as a Word-based template:

- Staggered deadlines and feedback that occurred throughout the semester, instead of one formative assessment initially followed by a single submission of the Theory Chart at the end of the semester. Staggered deadlines allowed students to work continuously on the assignment throughout the semester. Previously, they generally had worked on the assignment in isolation immediately before the deadline.
- Better integration of the assignment and theory connections with the linked practicum course and teaching experiences, which primarily took place during the latter half of the semester. Thus, the T2P ePortfolio became part of the practicum experience instead of a paper-based assignment associated with the educational psychology course.
- Opportunities for personalization and more complex content through the use of pictures, images, graphic organizers, hyperlinks, videos, specialized formatting, and so forth. Students were able to add, for example, graphic organizers, diagrams, and photos of their practicum students and anchor charts to illustrate their points (e.g., see Appendix B).
- AAC&U VALUE Rubrics embedded into the Digication platform for clear feedback.
- Social interaction among students.
- Integration of other evidences, including a statement of teaching philosophy, which served to further integrate theory and practice through alignment of the content and themes represented in the ePortfolio as a whole.

The T2P ePortfolio meets several goals of integrative ePortfolios, as outlined by Reynolds and Patton (2014, p. 13): it (a) provided an opportunity for the students to demonstrate how well they learned the course content through the theory summaries and teaching examples; (b) offered an opportunity for them to reflect on the theories and their experiences in the classroom through the personal stances/reactions; (c) provided a venue to develop connections among content by showing how the summaries informed the teaching examples, personal stances, and teaching philosophies; (d) afforded a means of identity development through the statements of teaching

Table 2  
*Reliability and Sample Items*

Scale	No. of items	Example item	$\alpha$
eMpowerment	5	“I have control over how I learn the course content.”	.937
Usefulness	5	“I find the coursework to be relevant to my future.”	.936
Success	4	“I am confident that I can succeed in the coursework.”	.919
Interest	6	“I enjoy the instructional methods used in this course.”	.939
Caring	6	“The instructor is respectful of me.”	.926

philosophy, personal stances, and teaching examples, which all focused on the students’ personal experiences and reflections in and outside of the classroom as preservice teachers and college students.

### Research Questions

Given the nature of the T2P ePortfolio in bridging theory and practice more explicitly and inproviding a venue through which students can connect what they learned in the course to their practical experiences, I developed the following research questions:

- RQ1: Can reframing a major course assignment as an ePortfolio impact student motivation in a course?
- RQ2: Can reframing a major course assignment as an ePortfolio affect student achievement on an assignment, as measured by a rubric assessing higher order thinking?

I hypothesized that the students’ motivation for the course as a whole might be affected in terms of their perceived usefulness due to the T2P ePortfolio’s focus on bridging theory and practice. In addition, I hypothesized that their grades on the assignment would be higher in the intervention group because the T2P ePortfolio was designed to facilitate deeper, more meaningful connections than the format the Theory Chart allowed.

### Methodology

#### Participants

The participants in this study include a convenience sample of four course sections of undergraduate students enrolled in a junior-level teacher preparation course focused on learning theories (essentially, an introduction to educational psychology). All students were enrolled in an Elementary Education teacher preparation program in a large public university in the Eastern US. There were a total of 93 participants: two course sections participated as the control group ( $n = 50$ ) and two course sections comprised the intervention group ( $n = 43$ ). The same instructor taught

all four course sections. Of the 93 participants, the majority were female (93.5%) and most identified as White (79.6%). The remainder of the students identified as Black or African American (16.1%) or Hispanic or Latino (4.3%). The reported demographics in this sample are representative of the program’s demographics. Previous research indicates that the larger elementary education workforce is similarly predominately female (Goldring, Gray, & Bitterman, 2013). Chi-square tests were used to analyze any differences in demographics between the experimental groups. Results indicated no significant differences in race ( $\chi^2 [3] = 7.740, p = .052$ ) or gender ( $\chi^2 [1] = .056, p = .814$ ) between the control and intervention groups. Students were either enrolled by their advisors or chose to enroll in the course during mandatory enrollment periods each semester.

#### Measures

To measure perceived motivation in the course, I used the MUSIC Model of Academic Motivation Inventory-College Student Version (Jones, 2016). The MUSIC Inventory includes five scales: one for each component of the model. Example items can be found in Table 2, and the full survey can be accessed via Jones (2016). The survey measures students’ motivation for the course rather than a specific assignment or aspect of the course. This was intentional because my objective was to investigate the presence of significant differences in overall motivation in the course following adjustments to one part of my instructional practice, albeit an assignment that spans the semester. The MUSIC Inventory has been found to be valid and reliable with college level students in a variety of disciplines (Jones & Skaggs, 2016), and factor analyses suggest that students at many levels and in multiple domains perceive each MUSIC component as a separate construct (Chittum & Jones, 2017; Jones & Skaggs, 2016; Jones & Wilkins, 2013). Cronbach’s alpha coefficients indicate acceptable reliability among each measure in the present study (Table 2).

I measured the impact on student achievement of the assignment through the use of adapted VALUE rubrics developed by AAC&U (2017d, 2017e). Because my goal

Table 3  
*Intercorrelations and Descriptive Statistics*

	1	2	3	4	5	6
1. Empowerment	–					
2. Usefulness	.679**	–				
3. Success	.751**	.672**	–			
4. Interest	.761**	.805**	.767**	–		
5. Caring	.560**	.656**	.544**	.655**	–	
6. Grade	.012	.056	.118	-.023	-.074	–
<i>M (SD)</i>	4.81 (0.94)	5.36 (0.66)	4.98 (0.87)	4.99 (0.81)	5.50 (0.64)	86.59 (9.37)

Note. Grade  $n = 93$ . MUSIC model variables  $n = 91$ .

\*\* $p < .01$  (2-tailed).

\* $p < .05$  (2-tailed).

was to aid students in deepening their learning through the revised assignment, I used specific dimensions (rows) from the Integrative Learning, Critical Thinking, Inquiry and Analysis, and Written Communication VALUE rubrics and adapted them for this purpose (AAC&U, 2017a, 2017b, 2017c). I developed three rubrics, one for each main section of the assignment: (a) theory summaries, (b) teaching examples, and (c) personal stances. As in the VALUE rubrics, the adapted rubrics were graded using the same four criteria 1 (*benchmark*), 2 (*milestone*), 3 (*milestone*), 4 (*capstone*). Each student's grades on the three rubrics were averaged to create a composite T2P ePortfolio grade.

### Procedures

This research study was approved by my Institutional Review Board. All major aspects of the course remained the same except for the changes in the assignment format from the Theory Chart to the T2P ePortfolio. Some similarities persisted between those assignments. Both the control and intervention group were given prompts to guide their work on each part of the assignment. There were minor differences in the prompts when the format changed; however, the presentation in class and the information provided were much the same. Expectations for content and depth of thought were communicated similarly in each course section, except that students in the intervention group also had access to the assignment rubric on the course's learning management system, Blackboard. However, anecdotal evidence suggests that students in the intervention group rarely made it a practice to examine the rubric before submitting assignments in Digication.

The intervention group was introduced to the Digication platform near the beginning of the semester. Their first summaries of the theories were due within weeks of the initial lectures, which would begin a stream of staggered deadlines that spanned the semester. Students in the intervention group submitted their work within the Digication platform throughout the semester, where it was

graded using embedded rubrics. In the control group, the Theory Chart summaries, teaching examples, and personal stances were all due at one time at the end of the semester in Blackboard. In working with the intervention group, troubleshooting technology and submissions took place throughout the semester, and instructions for how to submit, edit, and otherwise work within the Digication platform were provided to students via Blackboard. Finally, students completed the MUSIC Inventory on Qualtrics near the end of the semester. They were offered minimal course credit for completing the survey.

### Results

A rubric score on the assignment was available for all participants ( $N = 93$ ). However, two students did not complete the MUSIC Inventory ( $n = 91$ ). On average, the students in the control and intervention groups performed fairly well on the theory assignments (Tables 3 and 4). This program used a 7-point grading scale; thus, an average assignment grade of 86.59% for both groups would be a B-. The control group averaged a C grade (82.41%), and the intervention group averaged a B+ grade (91.45%). Both groups appeared to be motivated in the course (Tables 3 and 4), as their average ratings on the MUSIC components ranged from the upper 4s (4 = *somewhat agree*) and between 5 (*agree*) and 6 (*strongly agree*).

Pearson correlation coefficients for the measured variables are in Table 3. Assignment grade correlated weakly with all five MUSIC components, suggesting little association between the assignment grade and their motivation for the course. The correlation coefficients among the five MUSIC variables ranged from .544 to .805, indicating moderate to strong relationships among those motivation-related perceptions, which is consistent with previous research (Chittum & Jones, 2017; Jones & Skaggs, 2016).

I performed independent samples  $t$  tests to compare the five MUSIC model components and assignment

Table 4  
t Test Results

Scale	<i>t</i>	<i>df</i>	<i>M</i> diff.	<i>M</i> control	<i>M</i> intervention
Empowerment	-0.116	89	-0.023	4.80	4.82
Usefulness	-2.140*	87.33	-0.286	5.23	5.52
Success	-1.483	87.92	-0.315	4.86	5.13
Interest	-1.226	89	-0.218	4.89	5.10
Caring	-0.085	89	-0.205	5.50	5.51
Grade	-5.274**	91	-9.04 (%)	82.41 (%)	91.45 (%)

Note. Grade  $n = 93$ . MUSIC model variables  $n = 91$ . I graded all Theory Charts and T2P ePortfolios using the same rubric focused on content, integrative learning, critical thinking, analysis, and written communication.

\*  $p < .05$ .

\*\*  $p < .001$ .

grades between the control group (Theory Chart) and the intervention group (T2P ePortfolio). Results indicate that perceived usefulness and assignment grades were both significantly higher in the intervention group (Table 4). As expected, perceived empowerment, success, interest, and caring were similar in the control and intervention groups.

Given that I was working with a convenience sample and thus limited to a specific sample size based on students enrolled in my course sections, I computed a post hoc power analysis using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007) to determine effect size. Post hoc calculations indicated high effect for usefulness ( $d = .55$ ) and grade ( $d = .99$ ). According to Cohen (1988) an effect size of .10 implies a small effect, .30 is medium, and .50 is high. In addition, Lipsey and Wilson's (1993) meta-analysis also suggested that an effect size of .50 is sufficient in social science research, indicating that an effect of .55 for usefulness is adequate power.

### Discussion

This study extends research focused on the impact of ePortfolio-based instruction on student outcomes, which is a need-area in the current literature (Bryant & Chittum, 2013; Chittum, 2016; Rhodes et al., 2014). Moreover, this study fills a gap in research on preservice teachers by examining student outcomes beyond reflective practice and student teacher perceptions of ePortfolios.

Concerning the first research question, "Can reframing a major course assignment as an ePortfolio impact student motivation in a course?", independent samples *t* test results indicated that students' perceptions of usefulness in the course were significantly increased in the T2P ePortfolio group. Thus, the revised assignment format may have contributed to increasing perceptions of the value of the course content as it is applied to teaching in elementary

grades classrooms (e.g., via the practicum course) and the students' personal goals, which likely align with elementary teaching. Usefulness or utility value concerns feeling motivated to engage in a task because it relates to a future goal (Wigfield & Eccles, 2000) or understanding why the task and/or content is relevant or important (Jones, 2009). The T2P ePortfolio was designed to more discernibly bridge theory and instructional practice between a linked introductory educational psychology course and a practicum experience for education majors whose goal it was to become teachers. Thus, the technology appears to have provided a conduit through which students' perceived usefulness of the content could cultivate. These findings are consistent with an adult learning perspective that emphasizes the importance of perceived relevance to one's goals and life (Knowles, Holton, & Swanson, 2005). Indeed, Knowles et al. (2005) posited that one of the foremost principles in andragogy is that "adults need to know why they need to learn something before undertaking to learn it" (p. 199), which was inherent to the structure and function of the T2P ePortfolio.

To address the second research question, "Can reframing a major course assignment as an ePortfolio affect student achievement on an assignment, as measured by a rubric assessing higher order thinking?", independent samples *t* tests revealed students' assignment grades were significantly higher in the intervention groups. The rubrics used to grade the assignment measured content development, integrative learning, critical thinking, analysis, and written communication; thus, significantly higher grades in the intervention group suggest demonstrated improvements in higher order processing. As Wood, Bruner, and Ross (1976) noted, recognizing a problem and the solution to the problem is necessary before one is able to engage independently in the process. The T2P ePortfolio provided students with a venue through which they could define theories and then recognize them in their practice as appropriate instructional practices, solutions,

and labels, given each unique situation in the complex environment that is a modern classroom. In this way, the T2P offered a structured and scaffolded setting for students to consider the theories and apply them in a structured way to their teaching (present and future).

### Limitations

There are several limitations to consider. First, demographics were fairly homogeneous in that students who identified as White females comprised the majority of the sample. Although this is representative of the demographics in this particular program of study, the lack of diversity, in addition to a relatively small sample size based on convenience, limits the study's generalizability. It is important to note, however, that the elementary education profession is similarly homogenous in terms of gender (Goldring et al., 2013), if not race.

Second, the effect size for the motivation coefficient was within acceptable limits; nevertheless, an increased sample size would have rendered a higher effect and, thus, more power. Given the self-report nature of the measure, I expected a lower effect of the motivation variable than the grade variable.

Third, although I attempted to control for differences between the control and intervention groups to avoid threats to internal validity, some inconsistencies were unavoidable as time passed. One difference between the two groups is that the control group did not have access to the grading rubrics in advance, even though similar performance expectations were expressed. Anecdotal evidence suggests that most students generally did not examine the rubric before submitting work. Another difference is that, by the nature of the ePortfolio assignment, students in the intervention group were exposed to somewhat more feedback during the semester than the control group due to staggered deadlines. It is important to note that the control and intervention groups had the opportunity to submit a summary for formative assessment prior to submitting any work to be graded, which involved extensive feedback on their first attempt at a summary. In addition, the control group (unlike the intervention group) was given an example summary to reference, which aided their work. I did not provide the example summary for the T2P group because they would have more feedback (and thus examples) throughout the semester. Although there was an imbalance in feedback, I contend that staggered deadlines were a leading attraction of the ePortfolio format. As such, rather than view the differences only as a validity threat, I posit that they represent a deliberate choice made in hopes of eliciting a positive impact.

Other changes were minor and typical to expected fluctuations among classes and semesters. My objective was to avoid major changes so that the study would not

be unduly affected. For example, sometimes course topics were presented in a slightly different order (e.g., one semester, behavioral learning theory and information processing theory switched order). In general, reading and course assignments other than the T2P ePortfolio remained very similar or exactly the same, and the PowerPoint presentations were only subjected to minor tweaks/corrections (if any). It is possible that my teaching improved and/or instructional style changed incrementally during the course of the study; however, the research took place over a relatively short time period (four semesters), so a significant change seems unlikely. Although it is possible that there is a threat to the internal validity of the grade due to instrumentation variations, I posit that there is some additional support for the internal validity of the motivation findings. Statistically similar perceptions of the remaining motivation variables (empowerment, success, interest, caring) imply that other factors in the course were likely similar across these semesters, excepting those that influenced perceived usefulness/relevance. Course revisions and innovations focused on usefulness were deliberately attained through the T2P ePortfolio.

### Conclusion

This research suggests that a course-based ePortfolio capstone assignment can positively impact student motivation in relation to students' subjective perceptions of value (usefulness) in the class and their demonstrated higher order thinking processes on the semester-long capstone assignment. The importance of perceived motivation in class has an established foundation in the literature. Students who are more motivated demonstrate more positive outcomes, such as improved performance, persistence, self-perceptions, engagement, and other positive outcomes (Deci & Ryan, 2000; Wigfield & Eccles, 2000). Moreover, in addition to more general calls for college students to mature higher order thinking skills in preparation for the workforce (Hart Research Associates, 2015; Hunt, 1995; O'Neil et al., 1997; Pillay, 2006), there are arguments specific to the need for teachers to develop robust higher order thinking skills. Higher order thinking processes are the basis of much of the curricular shifts in current US education system. For instance, "critical thinking, problem solving, and analytical skills" (Common Core state Standards [CCSS], 2018, para. 2) are integral to the current Common Core Standards. To teach those skills to students, some have posited that preparing educators to be critical thinkers is also important (e.g., Ruenzel, 2014). Educators are prime candidates for becoming fluent higher order thinkers, considering the many moving parts and problems they encounter on a daily basis in their classrooms and schools, much like many other professionals. Overall, this research suggests



that through instructional innovations such as this transformation of an assignment into an ePortfolio, teacher preparation programs may be able to support students in becoming more motivated in class and in developing needed higher order thinking skills on a smaller scale than program-wide, competencies-based ePortfolios.

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## Appendix A Assignment Templates

### Original Theory Chart Template:

#### Theory Chart

Exploring the Relationship Between Theory and Instructional Practice

As you read the assigned readings and we cover the theories and concepts in class, you may record your notes on the organizer and the chart. Pay special attention to how theory connects with practice in the classroom. *You should begin to identify with the approaches that appeal to you as a teacher-in-training. Everything you write should be in your own words.* You will also submit a Theory Chart Formative Assessment (see the calendar). You can use my feedback from the formative assessment to revise your work and to guide your future work. It is important that you put a lot of effort into this assignment not only because it is worth 10% of your grade in this course but also because you will use it to study for the midterm and final exams.

The graphic organizer (Part I) and the chart (Part II) will need to be completed with all of the theories included below. The final version should be completed and submitted in .doc or .docx format. Work on this template in Microsoft Word throughout the process.

**Part I:**

Exploring the relationship between theory and instructional practice in our elementary classrooms								
Behavioral Learning	Social Cognitive	Constructivism	Information Processing	Complex Processes	Motivation	Cognitive Development	Psychosocial Development	Moral Development
Keywords/ Names to remember:	Keywords/ Names to remember:	Keywords/ Names to remember:	Keywords/ Names to remember:	Keywords/ Names to remember:	Keywords/ Names to remember:	Keywords/ Names to remember:	Keywords/ Names to remember:	Keywords/ Names to remember:

**Part II:**

**Directions:** Using the template below, develop a chart to describe and reflect on each of the theories and concepts discussed in class.

Theory/Concept	Central Focus: Theory Summary	Practical Application	Personal Stance
	Summarize the theory. Hit all of the major points concisely and accurately. <u>Make sure to write your summary in your own words.</u>	Give a detailed example of a classroom application that illustrates the theory or concept. Be specific about what exactly you will do in the classroom. <u>Make sure to describe this using your own words.</u>	1. Reflect: Do you believe this theory/concept accurately and adequately describes how people learn and/or develop? Scale: 1 ( <i>not at all</i> ) to 10 ( <i>definitely yes</i> ) 2. JUSTIFY your response by relating it to personal experience. I'm looking for your personal connection to the content. Think about your own education and life experiences, and connect the content to one or more personal experiences. Tell me how that changed your behavior, made you feel, etc. If all else fails, think about your experiences in this course.
Behavioral Learning Theory			Rating: ___ Explanation:
Social Cognitive Theory			Rating: ___ Explanation:
Constructivism			Rating: ___ Explanation:
Information Processing Theory			Rating: ___ Explanation:
Complex Cognitive Processes			Rating: ___ Explanation:
Motivation			Rating: ___ Explanation:
Cognitive Development			Rating: ___ Explanation:
Psychosocial Development			Rating: ___ Explanation:
Moral Development			Rating: ___ Explanation:

**Revised Assignment Template (on Digication): T2P ePortfolio**

*Note.* The theory summary tab for one theory is showing in the above image.

**Prompts Posted on Blackboard and in the ePortfolio Template:**

**Summary prompt:** Summarize the theory. Make sure to touch on all of the major points concisely and accurately. A main focus is to show that you understand the theory as a whole and can think critically about its main concepts. Make sure to write your summary in your own words and try not to simply re-order highly technical words and terms from definitions you find in external sources, like the textbook. Instead, try to focus on understanding the theory and describing it in language that makes sense to *you*. For example, think about how you might explain these concepts to your roommate, best friend, or a family member.

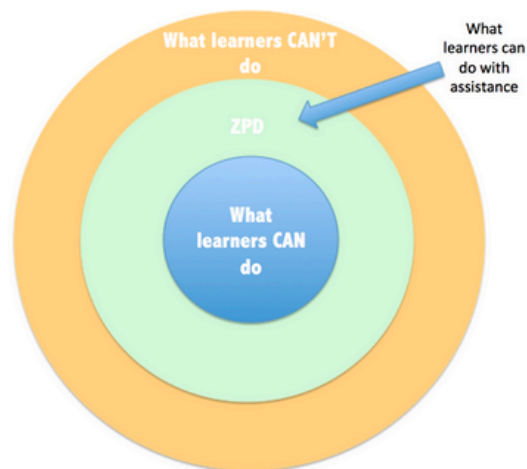
**Teaching example prompt:** Give a detailed example of a classroom application that illustrates this theory. Use your experiences in the linked practicum course to provide at least one example, and please be as specific as possible when describing the circumstances. You can use an example found in your own teaching, something you observed during the practicum, or write about an idea you formed when reflecting on your classroom-based experiences this semester (e.g., something you think you should have done or plan to do in the future). The key is to show that you understand the theory and can apply it to what you observe or do in a real classroom. In addition to at least one example of this theory based on your experiences in the practicum course, you can add any additional connections to teaching that you find in other sources, like memes, articles, pictures, or personal educational experiences. Make sure that you write everything in your own words.

**Personal stance prompt:** This section includes your personal stance about the theory/concept. When reflecting in this section, consider questions like the following: Do you believe this theory/concept accurately and adequately describes how people learn and/or develop? Please **JUSTIFY** your response by relating it to personal experience. In other words, this is your personal connection to the content. Think about your own education and life experiences as well as your experiences during the practicum course, other courses, and other practicums.

## Appendix B Example Personalization in T2P ePortfolios

**Theory Summary:** Example of adding personalized graphic organizers and images

Lev Vygotsky's ideas on Cognitive Development focuses on how our thoughts can be influenced by cultural norms but mainly by interactions with other people. The Zone of Proximal Development, ZPD, is the stage of learning how to do something with assistance. The ZPD is in a three-ringed diagram that breaks down and moves inward by what children cannot do on their own, ZPD, and what they can do on their own.



The person helping the child in the ZPD is usually a teacher or a more knowledgeable person. A person who is considered more knowledgeable is simply someone who is smarter than the child. In the ZPD while the child is learning with help, the person assisting the child benefits the learning as well, this is called reciprocity.

### Teacher Implications

- Help the students answer difficult questions by scaffolding:
  - Giving the students hints or asking them leading questions
  - This helps them solve problems that they would not have been able to solve on their own

### Theory Summary: Example of adding personalized graphic organizers

new information being learned without creating the misconception or confusion it is called equilibrium.



Equilibrium reminds me of a seesaw. On one side the seesaw has what the child has previously learned and whatever lands on the other side must become even with the previous knowledge. Disequilibrium is when someone creates a misconception or false idea about something new they see with their previous knowledge. This is when the seesaw that holds what the child previously learned on one side is uneven with the new knowledge trying to form.

For example, when a child studies an entirely different object and then later sees a different but similar object but believes it is still the first object based off of the

similarities. Assimilation is connecting new situations with old experiences that can create misconceptions or confusion. For example, when a person sees an object they have never seen before but have seen objects similar, they begin to think about the things they know about the objects that are similar to the new object. Making those connections from the old knowledge to something new is an example of assimilation. Accommodation is when old knowledge does not work and needs to be changed or corrected in order to learn. Referring back to the example above, after making the connections between the new object with the old object, the person learns about the aspects that were different than the old object compared to the new object, which is called accommodation.

## Teacher-centered vs. Learner-centered

### Teacher-centered

- Taught from *teacher to student*
- Passively teaching information
- Role: To give information and evaluate students
- The actual TEACHING & ASSESSING are done at different times
  - Assessments monitor the learning
- Always “right answers”
- Only the students are viewed as the learners

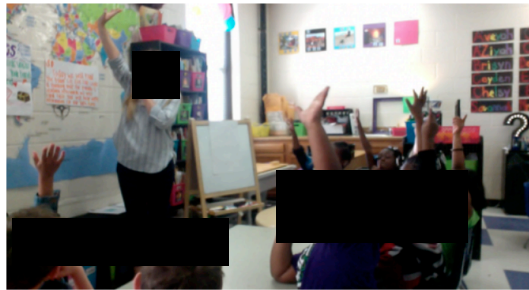
### Learner-centered

- Students use skills like problem solving, talking with one another, and critical thinking to learn
- Actively involved
- The teacher is more seen as a guide or coach that assists the student
- TEACHING & ASSESSING are done together
  - Assessments promote and diagnose the students’ learning
- Learning from their errors
- Students AND teachers both learn

In the classroom, the teacher should provide many different implications for the students. The teacher can allow the students learn through discovery. problem solving.

### Teaching Example: Screen shot from a teaching video

On my first day of teaching, I attempted to use vicarious reinforcement with my students, and examined how well they responded. On the first day we explained our group rule, which was, the student's must always raise their hand when answering questions. Because the students are in kindergarten, at times, they each needed an extra reminder of the importance of raising their hands. Instead of stopping the lesson and steering away from the material, I used vicarious reinforcement by complimenting one student on how well she raised her hands, I stated, "Thank you [REDACTED] for raising your hand, here is a ticket." Afterwards, every student's hand immediately shot up. The students strived for that same gratification that I gave [REDACTED]. Overall, including vicarious reinforcement increased student's positive behavior, which made each lesson run more smoothly. This has been one of the most valuable tools I have used to influence positive behavior.



I love this picture from my video. To me, it shows how engaged the students are and how great their behavior is.

### Teaching Philosophy: Example of social interaction in students' statements of teaching philosophy

finds out what interest their students. When learning is centered on student's interest, it strikes their curiosity and they want to find out more. Having student's curios all year keeps the learning interesting and the classroom fun. Finally when teachers show they care about their students, they feel at home and comfortable about being themselves. The MUSIC model is a very useful tool for teachers to use. To me, I feel like the model is something every teacher should use and it should be used every single year.

In my opinion, constructivist teaching works alongside with the MUSIC model. In a constructivist classroom, it is student-led. Rather than a teacher lecturing, the students learn hands on. Having students complete projects, discussions, and answer questions are a few examples of constructivist teaching. I believe when students are in control of their own learning, they learn more efficiently. In my own classroom, I try to have a constructivist setup. I never want my students to feel bored and not challenged. I also believe in a constructivist classroom, students feel like they can get so much accomplished. Also, I believe in a constructivist classroom those misconceptions students have get noticed and solved. When my students have misconceptions, I find ways to bring them back to a state of equilibrium. I know at a state of disequilibrium, students feel lost and confused. Until students are brought back to that equilibrium state, they will feel unsuccessful in the classroom.


In my classroom, I use sources of motivation and authority. I want my students to feel comfortable with me and see that I'm a fun teacher. I want my students to also know that if they get out of line or need structure, I'll be there to give it to them. I like for my students to see their rewards I give them. When students receive awards for their great work, they are motivated to continuously do good things. I've always liked to make my lesson enjoyable for my students. Rather it be favorite things or familiar TV shows, I always like to think from the point of view of my students. As I plan my lessons, I take the time to think of how to structure my lessons to fit around my students. Going into the start of my lesson, I find a way to grab their attention. Once their attention is grabbed, I make sure I keep it by having them constantly involved in the lesson. I've also found that when my students get off topic or out of hand, reeling them back in without putting complete focus on them, helps them to get back focused.

I believe teaching this way is great way for my students to learn. I found my student enjoyed having me around and learning. I also saw my students grow from not knowina much to knowina so manv things. Thinkina mv students wouldn't remember

**“** *Thinking my students wouldn't remember what they learned from day one on the...*

⚠ This is visible on the published page.

Type your comment here...

 [REDACTED] Dec 12, 2016

I thought the same thing and at the end of the semester when I saw our student's results I was so happy and I realized how rewarding teaching really is.