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Exploring and Describing Marketable Skills in Teacher Education

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ABSTRACT

Students and lawmakers are concerned: do marketable skills learned in teacher-preparation programs transfer to the teacher's classroom? In order to diagnose the problem of marketable skills transfer, this study used an existing critical framework to analyse transcripts and field notes from interviews with three leaders in teacher preparation programs. Emergent themes supported prior research. For example, these leaders valued competency in researching and presenting, which are marketable skills in the current school climate. However, their emphasis on higher order thinking skills like critical thinking and metacognition may be a sign that these leaders are disinterested in basic skills like communication and teamwork, which are skills that prior research shows are necessary for the development of higher order thinking. A theme about teaching using pedagogical methods also emerged. We call this theme pedagogical literacy and assert that it is unique to teacher preparation programs. Future research should explore the demand for critical thinking as well as the presence of pedagogical literacy outside of departments that prepare educators.

Keywords: marketable skills; teacher education; competencies; knowledge, skills, and abilities

Exploring and Describing Marketable Skills in Teacher Education

The transfer of skills from higher education into the workforce and specifically the metacognitive ability to market one's skills to potential employers is a primary goal of the Texas Higher Education Coordinating Board (THECB) 60x30TX plan. Identifying these skills is Goal Three: 'Marketable Skills.' Marketable skills are 'skills valued by employers that can be applied in a variety of work settings… acquired through education' (Texas Higher Education Coordinating Board [THECB], 2015).

Colleges of education (COEs) are key stakeholders in the marketable skills goal of 60x30TX. Ingersoll (2001) showed evidence that the turnover rate for teachers is about 13.8% for teachers on average. This study identifies the marketable skills of graduates from COEs, with a focus on COE students seeking teacher certification. The THECB (2015) outlines the identification of marketable skills as a multi-step process of collaboration between higher education administrators, university faculty, current students, graduates, and local employers.

A major source of inspiration for the THECB in creating the 60x30TX plan was Perna and Finney's (2014) book on higher education, which focused on five states and rated them on the 'Measuring Up' scale in 2000 and 2008. Although Texas (the state in which this study's subject university resides) showed growth in the 'preparation' sub-scale, there were measurable losses in higher education in the realms of 'participation,' 'completion,' and 'affordability.' Perna and Finney (2014) place the onus of correcting these losses on higher education policymakers because they have the power to 'eliminate the forces that serve to perpetuate and institutionalize differences in higher educational outcomes across groups.' The implementation of the 60x30TX plan manifests the THECB's serious appraisal of this charge.

Marketable skills, including interpersonal, cognitive, and applied skills, are practised in higher education with the goal of learning them, but they are not always learned successfully, which is a primary problem identified in the 60x30 plan (THECB, 2015). Thus, this study accomplishes the first step of the multi-step process of the 60x30 plan to solve these problems. Higher education administrators who oversee teacher education but those who are not too removed from the process include department chairs. This purpose is accomplished by interviewing COE department chairs and analysing interview transcripts for expected and emergent themes. Interviews were semi-structured, driven by two research questions:

(1) What skills do COE administrators identify as being practised and meaningfully learned by COE graduates who sought a teacher certification?

(2) What skills do COE administrators identify as being practised but not learned by COE graduates who sought a teacher certification?

Literature Review

Prior research citing skills focus on terms like marketability and employability. However, definitions of these terms are fuzzy (De Grip, Van Loo, & Sanders, 2004). Moreover, the 60x30TX is focused on the transfer of these skills from college to the workplace. Additionally, results of this study will show that critical thinking is highly important to teacher education, which is also a problem identified by the 60x30TX plan.

Marketability and Employability

The problem of marketing oneself after graduation from educational institutions is not new. Charner (1988), as part of work in the National Institute for Work and Learning, identified the same problem as occurring for high school graduates. Charner advocated for the use of an 'employability credential'; a supplement to job-seekers' resumes. With the guidance of a school counsellor, the graduate would create a credential describing their experiences, hobbies, and activities. The credential would be necessary to use during interviews.

For Charner, a diploma is insufficient because it only affirms the completion of the same curriculum for holders of that diploma, leaving potential employers to infer the meaning of that diploma, drawing from their own experiences of gaining a diploma. Without the employability credential, employers fail to differentiate amongst high school graduates. Beside its use as a supplement to resumes, Charner claimed that the employability credential would aid in career exploration, education planning, and provide young adults with a sense of self-worth and future direction.

Although the problems of lacking clear credentials were clear, through the 1990's the definition of employability lacked consensus. Whether it was the labour market potential and occupational skills, applications in organisations, responsibility of governments, the ability to 'steer' one's career, or flexibility and adaptability, the concept of employability had become rather fuzzy (De Grip, Van Loo, & Sanders, 2004). Problematically, these models tended to focus on personal adequacy to perform a job, called the employability radius, and personal qualification to survive in the labour market, called employability skills, while ignoring contextual factors (Thijssen, Van De Heijden, & Rocco, 2008).

Moreover, since Charner's (1988) work, total college enrolment has increased by 52.8% (National Center for Education Statistics [NCES], 2014). Although college enrolment seemingly should increase one's portfolio of skills, the 60x30TX strategic plan (THECB, 2015) identifies marketing oneself after graduation from college as a problem. Although college graduates are learning marketable skills and cite the desire of getting a better job as motivation for pursuing a college degree (Eagan et al., 2016), graduates 'are not always aware of the value of these skills or able to articulate them to employers' (THECB, 2015, p. 22). The problem Charner (1988) identified continues, identified today by the 60x30TX plan. Increasing college enrolment has simply delayed the problem from after high school graduation to after college graduation.

KSA Model

Transfer of skills from a COE to a different setting, like the workplace, is the principal assumption underlying education (Bennett, Dunne, & Carré, 2000). An internally coherent model of skills is necessary in order to support decision-making at the college level. Furthermore, a model that explicitly incorporates skills is necessary for a study of marketable skills. The Knowledge, Skills, and Abilities (KSA) model is used by federal agencies, like the Centres for Disease Control (CDC) and the Department of Veteran's Affairs (VA), as well as various state government agencies in Texas. Importantly, the Texas Education Agency, the state agency that certifies teachers, including graduates from this study's subject COE, sees fit to hire its administrative and clerical staff using the KSA model (Centers for Disease Control [CDC], 2016; Office of Human Resources Management [OHRM], 2009; Texas Education Agency [TEA], 2017). Operationalised definitions of knowledge, skills, and abilities were adopted from the CDC and VA.

- Knowledge is an 'organized body of information, usually factual or procedural in nature' that 'makes adequate performance on the job possible' and is 'applied directly to the performance of a function.'
- Skills are 'the proficient manual, verbal, or mental manipulation of data or things' that can be 'readily measured by a performance test.'
- Abilities are 'the power or capacity to perform an activity or task' which is 'evidenced through activities or behaviours that are similar to those required on the job.'

Transfer

Transfer of marketable skills from COEs to the workforce, whether that is through working in a school or some other career path, is a fundamental concept behind the 60x30TX marketable skills goal. In fact, transfer is a fundamental concept for schooling altogether, not just for COEs (Bennet, Dunne, & Carré, 2000). Whether it's a mundane transfer of arithmetic to grocery shopping or the more esoteric transfer of chess skills to business strategy, beliefs about transfer precipitate schooling. Although transfer is the implicit and assumed goal of education, transfer does not always successfully occur (Bennett, Dunne, & Carré, 2000; Perkins & Salomon, 1994).

One factor affecting successful transfer is nearness of the situation in which a skill is learned. When situations are similar, transfer is near; when dissimilar, it is far. This observation is the basis of the theory of Situated Learning. Situated Learning realises the fact that it is difficult to separate learned skills from the situation in which they were learned (Anderson, Reder, & Simon, 1996). This applies equally to higher-order thinking skills, such as critical thinking (Reid & Anderson, 2013). However, the abstract nature of critical thinking alters the understanding of near and far transfer. To that end, Salomon and Perkins (1988) developed the high-road/low-road model of transfer, which is another layer of transfer alongside the near/far distinction.

Low-road transfer has as its goal automatisation of skills, such as addition of two-digit numbers. This is regardless of the nearness of transfer; automatised addition, learned in an elementary classroom setting, is transferable to middle school and university as well as grocery shopping, commercial marketing, dancing, or engineering. On the other hand, high-road transfer is concerned with decontextualised abstractions, such as physical laws or theoretical concepts. Again, this is regardless of nearness. Newton's first law of motion, learned in a science classroom, is transferable to upper-level science courses or successful race car driving (Bennett, Dunne, & Carré, 2000).

A graduate of a COE, such as a teacher, who learns theories of learning, such as socio-culturalism, constructivism, cognitivism, or behaviourism would engage in high-road transfer, deliberately searching for varying context to these abstract theories. This high-road transfer might be near: the teacher may need to take a test certifying their skill, which is similar to a test taken in a COE classroom. Likewise, the high-road transfer might be far, where the abstract concept of socio-culturalism might add beneficial context to a situation in which a teacher is working with an at-risk student. Similarly, low-road transfer could be near: grading papers is an automatiseable skill. Likewise, low-road transfer might be far: grading papers might be used in making judgements on achievement in general. The instances of far transfer is important to this study because, as mentioned above, not all graduates from a COE are probabilistically going to remain teachers (Ingersoll, 2001).

Critical Thinking

Employers and governments are emphasizing higher-order thinking skills such as logical, analytical, and critical thinking skills (Popova, Evans, & Arancibia, 2018). Because these skills are desirable (Barnaby, 2016) they are therefore marketable. Although they are all part of the unitary concept of higher-order thinking, they are somewhat different and separable (Ausubel, 1963; Black, 1952; Ennis, 1987). A logical approach follows some rule, an analytical approach breaks down a phenomenon, and a critical approach treats decisions based on information as fallible (Donnelly & Linn, 2014; Hurley, 2008; Robins, 2011; Wason, 1968).

For example, a teacher observing an error on a student's math assessment could use any combination of these higher order thinking skills. Logically, they could determine that if the answer is wrong, then the learning has not occurred. Analytically, they could conclude that the error consists of translation and/or integration and/or planning and/or execution (Mayer, 1985). Critically, they could decide that a majority of students provided correct answers while acknowledging that the assessment itself might be flawed or that they themselves failed to follow best practices.

It seems that with the privileges of abundant nourishment and high-quality education, developed countries' employers and faculty alike can raise their expectations of learners and job-seekers; they can de-emphasise basic skills and focus on critical thinking, which a manifestation of the rising expectations. However, people are still likely to rely on heuristics and their biases (Kahneman & Tversky, 1982; Kahneman, 2011).

While working memory helps people to make decisions quickly and shortcuts in thinking create efficiencies in behaviour, it also creates illusions. As such, a person's estimate of the probability of an event is based on personal familiarity (Kahneman, 2011). Such biased estimates apply to university faculty as well (Kahneman & Tversky, 1982). Therefore, it is possible that the advice to de-emphasize basic skills and focus on critical thinking is founded in the memories of educated professionals, such as university faculty who are already proficient at critical thinking (Abadzi, 2016). It is with this knowledge that the interviews were conducted.

Overall, therefore, an important issue leading into data collection is critical scepticism of higher education administrators' bias towards the transfer of critical thinking as a marketable skill.

Methods

The research questions were answered through a qualitative thematic analysis of interview transcripts. Researchers adopted a critical framework, but balanced critique with the experience and expert opinions of the participants.

Settings and Participants

This study's subject university COE (the COE) is a tier 1 research university according to the Carnegie Classification of Institutions of Higher Education. Three of the COE's four departments offer undergraduate degrees leading to teacher certification. As step one of the multi-step process outlined in the introduction, the participants of this study were

department chairs from the COE (n=3). This is an expert sampling technique. These administrators have years of experience in higher education ($\bar{x}$=33.66,sd=7.64) and years of experience in administrative positions in higher education ($\bar{x}$=16.66,sd=9.5). All participants were males over the age of 50 and hold doctoral degrees. One of the three holds a certification in teaching. Participants were recruited through personal communication. All participation was voluntary in accord with institutional ethics.

Past Methodologies

60x30TX sets cooperation between employers and educators as a primary means of accomplishing the marketable skills goal. Therefore, implementing a procedure for this cooperation is imperative. Rosenberg, Heimler, and Morote (2012) compared three perceptions of eight skills amongst three groups. Similarly, Wickramasinghe and Perera (2010) surveyed two perceptions of 15 skills amongst three groups. Surveying different groups' perceptions of skills is similar to the collaborative and cooperative requirements set forth for the 60x30TX Marketable Skills goal. This separation of perceptions of skills gives credibility to the research questions as well as the multi-step process.

KSA Model

The widespread use of the KSA model (CDC, 2016; OHRM, 2009; TEA, 2017) provides a strong defence for identification of marketable skills though the KSA model. In other words, regardless of the validity of the KSA model, it is widely used and graduates of the COE would benefit by identifying their skills according to the model being used by employers.

Skills and Abilities Enumeration

There is no lack of academics' listing of skills; lists allow humans to comprehend infinity (Eco, 2009). Thus, this study consulted fourteen lists of skills from various authors and five web pages pertaining to the subject COE to construct a list of over 200 terms. These terms were variously defined in their sources as skills, abilities, competencies, capabilities, and attributes. Some terms were repeated amongst lists ('communication' or some variant was most popular), but the way the term was defined between lists was not always consistent. For example, Bennett, Dunne, and Carré (2000) defined motivation as a 'personal competency,' Cheetham & Chivers (1996), Meyer (1992) and Meijers, Kuijpers, and Gundy (2013) referred to 'competencies', and Anderson and Marshall (1996) an 'attribute.' Indeed, 'the problem of terminology is now endemic… shift[s in terminology are] not paralleled by any theoretical or conceptual development of justification' (Bennett, Dunne, & Carré, 2000).

Researchers solved this ambiguity by using three rules. First, terms that were directly repeated exactly on multiple lists were replaced with a single instance. Second, terms that researchers agreed were similar were combined and separated by slashes. For example, the terms 'business thinking' and 'entrepreneurial skills' became 'business thinking/entrepreneurial skills.' Third, some terms were antecedent to the same referent or they referred to the same antecedent, so they were combined and separated by slashes. For example the terms 'perform efficiently' and 'perform effectively' became 'perform efficiently/effectively' and the terms 'develop programs,' 'implement programs,' and 'evaluate programs' became 'develop/implement/evaluate programs.' The final list contained 101 terms. It was sorted randomly using the 'rand()' command in Microsoft Excel before presenting it to participants.

Data Collection Instrument

Interviews were guided using a data collection instrument. Rather than searching for some latent construct, this instrument was used to collect field notes during interviews. This instrument had two questions that referred to the list of skills and abilities. The questions mirrored the research questions:

Of these terms on this list, which do you believe are:

- Marketable skills that are practised and meaningfully learned by students in your department's undergraduate degree programs?
- Marketable skills that are practised but NOT meaningfully learned by students in your department's undergraduate degree programs?

Thematic Analysis

In order to analyse themes, one researcher listened to the interviews multiple times with specific purpose to identify skills and abilities. The data collection instrument was also used for this purpose and served to triangulate findings. Then, in a collaborative coding session, two researchers read transcripts aloud, highlighting expected themes, stopping to discuss

emergent themes. After this initial coding session, a third researcher reviewed interview transcripts and the themes in order to give feedback and refine the codes. These coded transcripts were then transferred to NVivo, which allowed researchers to produce a report containing quotations organised by codes.

Results

KSA Model

Participants consistently stated that the 'categories are vague' in the KSA model. One participant simply states that a skill, such as critical thinking, cannot 'be reduced' to a phrase. Although all of the participants were asked to categorise the list of terms, two of the department chairs did not complete the task. Even the one department chair who completed the task prior to the interview related that 'sometimes the same attribute can be all three [categories]… it depends how you define them or how you look at them. They are not clear cut and that has been a problem theoretically for a long time.'

Themes

Researchers expected two themes: 'learning' and 'skills and abilities.' Additionally, researchers identified five skills and abilities as emergent themes.

Learning

Two participants used the term 'hope' in connection with learning: one participant hopes faculty are 'teaching [their] students not to take anything for granted' while another participant hopes COE faculty give COE students 'some knowledge and skills so they're better.'

According to another participant, when it comes to learning, even though faculty are the teachers, they themselves learn from their students. This learning is more likely to occur in upper-level courses:

> *Interviewer: '[Skill/Ability X is] not always necessarily meaningfully learned, but it's definitely being taught?'*
>
> *Interviewee: 'Yeah, absolutely… that's where the feedback loops are important… if I take a student who's done our intro class, and I get 'em into the next tier… I can tell if they've learned what we wanted them to learn… Where you can really, in my view, measure where those learning outcomes are met is in the next level of class…'*

Skills and Abilities

Researchers expected skills and abilities, but there was no expectation as to specific skills and abilities that participants would reference in the interviews. Researchers identified five skills and abilities as themes.

- Researching
- Presenting
- Pedagogical Literacy
- Critical Thinking
- Metacognition

The following sections detail the terms that emerged from interviews by considering the three interviews as a single case.

Researching

According to Bennett, Dunne, and Carré (2000), researching is gathering information using appropriate sources. According to the participants, research and resources used in research are meant to be critiqued, or used critically. Participants advocate 'looking more broadly' while researching and being a 'critical consumer of information.' An example of the concept of researching discussed by the participants was the description of how teachers do research after graduating from the COE:

> *…it's teacher as decision-maker, as reflective practitioner… as researcher… because the teacher is handling a lot of data every day, and handling data with the ultimate goal of making instructional kinds of decisions… [Teachers are] gathering data… organizing data… analysing that data and drawing conclusions from it, and those conclusions impact instructional decisions… [it is about] making sound decisions that you can support, based on the data… hopefully, we give them some knowledge and skills so they're better at each of those steps, in terms of how they collect data… manage it… compile it… organize it… how they [are] analysing… thinking about it… making decisions from it, and implementing [those decisions]…*

Presentation

Researched information can be organised into presentations, which is a familiar practice in formal schooling. Participants are clear on expectations and examples of presentations. COE students must make their presentations meaningful through a variety of media, including orally, in writing, and visually. For example, one participant describes presenting as having 'dimensions':

> *I think oral presentation skills are absolutely important, as are written, as are the ability to add that sort of visual dimension to them. Because if you can't do that, you know, it doesn't matter whether you can make a good argument, doesn't matter whether you can be collaborative or not – if you can't communicate, you can't be collaborative.*

In addition to being meaningful, participants recommend that presentations by teachers should also be 'usable,' 'clear,' and 'succinct.'

Pedagogical Literacy

Participants relate some of the particular theories a teacher uses, such as Gardner's multiple intelligences, differentiated instruction, learning styles, and Bloom's taxonomy. Specific knowledge of these theories is available in classes offered at the COE taken by future teachers:

> *…If you go into one of our education classes, you may see some short lectures, but you're going to see lots of other different strategies going on… the things I'm doing with my college students are very much the same kinds of things I would want to do with my EC-12 students.*

Thus, participants believe that COE graduates working as teachers are literate in a variety of pedagogies. The term 'pedagogical literacy' is used here similar to Murdoch's (2016) use of the term 'psychological literacy,' which encompasses the specific knowledge gained by psychology students.

Critical Thinking

COE administrators value critical thinking as a competency of COE graduates. Critical thinking is desired by employers in developed countries (Abadzi, 2016; World Bank, 2013), so it makes sense that COE administrators see critical thinking as desirable. Participants describe critical thinking at length: it is 'solving problems,' 'addressing a problem,' and being able to 'justify why I was doing it that way.' According to one participant, critical thinking requires taking 'different angles or multiple perspectives' and 'knowing how diverse people's learning and development is.' Another participant invokes the socio-cognitive theory of mindset, such that learners must have a 'mindset of exploring' and a 'questioning mindset.' Simply put, when learners are critical thinkers, they know 'how to think better.'

Moreover, according to participants, COE graduates always transfer this critical thinking to their classroom, whether they are aware of this transfer or not: '…if they're aware of it [their critical thinking] and know how to do it more systematically, they'll do a better job of it… because they're consciously doing those steps.'

Discussion

KSA

Although state government agencies and even the COE's sister business college use the KSA model, the federal government's Office of Personnel Management (OPM) in The President's Hiring Reform Memo supports the participants' antipathy for the KSA model, which has mandated that essays based on KSAs are not allowed in initial application for federal employment. While knowledge, skills, and abilities are still assessed in hiring for federal jobs, the focus is on a candidate's competencies, which are 'measurable pattern[s] of knowledge, skills, abilities, behaviours, and other characteristics that an individual needs in order to perform work roles or occupational functions successfully' (Office of Personnel Management [OPM], 2010).

From a critical perspective, participants may have disliked the KSA model because they were incapable of articulating the skills and abilities learned in their departments' programs. However, department chairs are highly trained in their fields and have many years of experience in administrative positions. Therefore, by combining a technocratic trust in participants' intuitions and the aforementioned policy from the federal government, identifying competencies is more advantageous than focusing on skills or abilities separately.

This interpretation leads to the need to alter the research questions and the expected themes, which is common in qualitative research studies (Van Wynsberghe & Khan, 2007). Rather than differentiating between 'marketable skills' and 'applicable abilities' (see above), the term 'competency' replaces them, such that the research questions are:

(1) What competencies do COE administrators believe are practiced and meaningfully learned by COE graduates?

(2) What competencies do COE administrators believe COE graduates practice but do not learn?

Themes

Because the research questions changed in data analysis, there was a symmetrical shift for expected theme two, which changed from 'Skills and Abilities' to 'Competencies.' The following section discusses the expected theme 'Learning' and the five emergent themes now labelled as 'Competencies.'

Learning and Competencies

Participants' references to students' responsibility to turn their knowledge base into 'deliverable skillsets' is reminiscent of Charner's (1988) employability credential. Primarily, students must be aware of their own competencies in order to create this credential. However, Charner recommended the assistance of a trained facilitator in the creation of employability credentials. For Charner, in high schools, this would be an expansion of the role of guidance counsellors. The individual who would fulfil this role in The COE or higher education in general is less clear. This facilitator, whoever it is in The COE, though, would need to be familiar with the competencies learned in The COE and be available to COE graduates whenever a career change is in mind, as a service to alumni. This is especially pressing because a meaningful proportion of teachers quit the profession (Ingersoll, 2001). If one is trained to be a teacher, there may be considerable difficulty for the graduate to understand how their competencies may transfer to other settings.

Participants' answers to specific questions about learning outcomes reflected a carefulness about making any definitive statements about learning. Rather, participants expressed their 'hopes' for teaching. This might be due to their highly bureaucratic positions and being removed from the classrooms in which future educators are learning. However, as leaders of faculty and students, department chairs should have a concept of the current state of learning outcomes and how their department will grow. Without such a concept, it seems that department chairs lack vision.

One participant spoke about how skills and abilities intersect, which supports the idea of 'patterns' vis-à-vis the Presidential Hiring Reform Memo (OPM, 2010). However, while department chairs expect students to 'connect the dots' in the intersecting patterns of competencies, they have also been witness to a 'disconnect' in this process. Thus, having a clear outline of intersecting patterns of knowledge, skills, and abilities provides a way to 'map the curriculum,' which one participant claims is a way to protect from the 'disconnect.' Such a map emerges from thematic analysis of this study's results (Fig. 1). The map in Figure 1 is non-temporal and semi-hierarchical, that is participants made reference to no time order of teaching or learning these competencies and they referred to one competency as more important than all others: critical thinking.

Critical Thinking, Researching, and Presenting

The participants' enthusiasm for critical thinking is itself subject to critique. While participants clearly desire the critical thinking competency, participants' eagerness for critical thinking might be evidence of Abadzi's (2016) thesis that expert thinkers emphasize critical thinking due to a cognitive bias. A cognitive bias occurs when the probability of an event is overestimated due to personal familiarity (Abadzi, 2016; Kahneman, 2011). For example, an expert in learning and teaching may overestimate the need for a higher-order thinking skill because they are exposed to such patterns every day.

Participants believe that competencies such as presenting or adapting are 'based' on critical thinking and that 'analysing information' is a 'step two' that comes 'after' and 'comes from' critical thinking. Theories of critical thinking, however, normally place such higher-order thinking skills hierarchically 'above' basic skills and temporally 'after' fundamental concepts and procedures (e.g. Bloom's taxonomy). The participants instead think of critical thinking as being a starting place for other skills and abilities. While this may be interpreted as more evidence that department chairs are cognitively biased and have a fundamental misunderstanding of critical thinking, it is possible that department chairs simply set high expectations for their students.

Figure 1

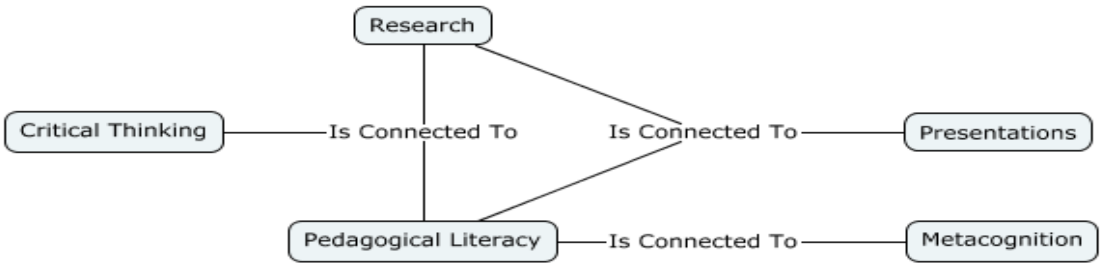

Figure 1. There are connections between the competencies that are taught and learned in the COE. This network of competencies is non-temporal and semi-hierarchical.

In support of the interpretation that chairs set high expectations, participants describe their hope that, by the time an individual matriculates in to the university, the primary and secondary schooling the student has received should have led to a mastery of basic competencies, which leaves the university as a place for learning higher order thinking skills. If setting high expectations is a pattern and these expectations are fulfilled by COE students, then theoretically when COE students become teachers their own students will learn more and learn better. Like the opposite of a slippery slope, such a practice will lead to a Lamarckian evolution or it can be interpreted as a type of dialectical materialism (Lamarck, 1830; Marx, 1867).

Sometimes though there is still a 'disconnect.' It is important therefore that department chairs to consider if they can validly expect all students matriculating into The COE to have mastered basic competencies. It is not possible to say here that department chairs are definitely biased in their fervour for critical thinking, but combining what participants say with the strong evidence from behavioural psychology about cognitive biases, department chairs and other faculty members should recognise the potential for a cognitive bias in their keenness for critical thinking. They should revisit best practices in regards to the 'rules and prerequisites for learning and performance' in regards to the teaching of critical thinking skills (Abadzi, 2016).

One participant claims that critical thinking is necessary in the COE because student assignments include critiquing research. This establishes a connection between critical thinking and research (Fig. 1). The validity of including this type of assignment in teacher education courses is based on the idea that critiquing research will transfer to students' own research and that competency in researching will allow future educators to do 'action research.'

In addition, participants describe the familiar practice of students presenting their research, such as in a parent-teacher conference (Kroth & Edge, 2007; Martin et al, 2016; National Association for the Education of Young Children [NAEYC], 2016). This establishes a connection between researching and presenting (Fig. 1). However, while the participants make repeated connections between 'effective' communication and presentations, there is little elaboration on what makes communication effective or meaningful. As in the critical thinking competency, there is a potential that department chairs are cognitively biased in their enthusiasm for researching and presenting.

Participants jumped from mentioning basic competencies like communication to higher-order competencies, like research and presenting. Again, as in the critical thinking competency, this may be a product of expectations for COE matriculates, but the disregard of basic competencies like communication has possible consequences for future educators. Presenting implies an audience, so while the audience of a future educator in The COE is the faculty member teaching the class and probably the student's classmates, the audience of a COE graduate working as a teacher is their own students. Therefore, a disregard for basic competencies like communication is a disservice to COE graduates because they may not be able to 'go beyond ABCD' in their lessons, which in turn is a disservice to the next generation of learners

Pedagogical Literacy, Metacognition, and their Intersection

Participants refer to future educators' need to be competent in a variety of pedagogies. The definition of pedagogy provided by The Oxford Dictionary of Education (Pedagogy, 2009) has five parts grouped by what pedagogy is and what pedagogy encompasses:

- Pedagogy is…
  - (1) A professional practice and
  - (2) A field of academic study.
- Pedagogy encompasses…
  - (1) The practical application of teaching skills,

(2) Curriculum issues

Since a competency is a 'pattern of knowledge, skills, and abilities,' being literate of pedagogy can be a competency if such a pattern can be established. Part 3 of the definition explicitly states that pedagogy encompasses 'teaching skills' [author's emphasis] but what about the knowledge and abilities part of the pattern?

The 'strategies' mentioned by the participant (e.g. Bloom's Taxonomy, differentiation by learning style) mirror the definition of pedagogy because the theory of why these strategies work, such as through socio-cognitivism, is connected to curriculum issues, in part four. These theories constitute knowledge, as in part five, while the use of these theories in the classroom is a behaviour, which is the definition of an ability. Therefore, pedagogy is a pattern of knowledge, skills, and abilities and is thus a competency.

Furthermore, the previously discussed competencies, such as critical thinking, also have a variety of theories and respective bodies of research; in other words, they all have potential pedagogical literacy. Just as a COE faculty member teaches future educators to do research and presentations, COE graduates working as teachers teach their own students to do research and presentations. Whereas researching and presenting is already connected to pedagogical literacy, this line of reasoning establishes a connection between critical thinking and pedagogical literacy as well as a connection between pedagogical literacy and other competencies learned in The COE (Fig. 1).

The process of future educators becoming teachers lead to some confusion during interviews. Is the 'teacher' the faculty member facilitating classes in the COE, or are they the future teacher who is currently a student of the COE? Likewise, is the 'student' the current student of the COE, or are they the students of future teachers who will graduate from the COE? One participant believes that this distinction is unnecessary, because anything you say about one you can say about the other.

> *Interviewer: '…you said 'students' a few times… it seems like you're talking about students that teachers will have, and then the students in your program'*
>
> *Interviewee: 'I think it's both… we're modelling and doing very much the same kind of things that we want them to do when they're out in their classroom with the EC-12 students… it's hard to separate the two.'*

Thus, according to participants, desired competencies are modelled in COE classrooms and future educators can teach these same competencies to their future students. Furthermore, one participant believes this process occurs 'whether they are aware of it or not.' The participant is describing metacognitive awareness without explicitly using this term. This yields two conclusions.

First, the literature on metacognitive awareness and transfer supports the explicit connection between competencies being learned and competencies being used. However, participants did not articulate whether this awareness is encouraged. Do future educators realize COE faculty are acting as models? The second conclusion is that, because metacognitive awareness is a pedagogy in its own right, metacognition is not simply a desirable skill or ability; metacognition is a specific knowledge or theory that is taught in the COE. This connects metacognition to pedagogical literacy (Fig. 1).

Therefore, if future educators have pedagogical literacy, they are metacognitively aware of metacognitive awareness, which is a combination of two competencies. Another example is presenting about researching; teachers present their students with various media to learn how to do research, for example using books, worksheets, lectures, and group projects. Some combinations are familiar, such as researching about critical thinking, which is not necessarily unique to COEs; some citations about critical thinking in this article came from economics and other business-minded fields. However, this method of combining competencies learned in The COE yields a competency that is entirely unique to COEs.

Critical thinking is clearly desirable in the COE, but this study does not compare the desire for critical thinking across colleges within universities. The participants in this study report that students in the COE are better at doing their work when they are metacognitively aware of their critical thinking. Hypothetically, then, the same could be true of learners in colleges outside the COE (Perkins & Salomon, 1989). At least some philosophy students and art students are metacognitively aware of their competency in critiquing great works and at least some biology students and engineering students are metacognitively aware of their competency in critiquing current research.

However, consider again Figure 1. While theory supports the connection between metacognition and critical thinking in colleges outside the COE, there is no such theoretical support for a moderating or mediating effect of pedagogical literacy on the relationship between critical thinking and metacognition in colleges outside the COE. More research is necessary to test the emergent hypothesis that pedagogical literacy of metacognitive critical thinking is unique to the COE and COEs in general.

Conclusion

The 60x30TX strategic plan advises a multi-step process to identify marketable skills. This study began this process by analysing interviews with three COE administrators. This step confirmed the two expected themes and also resulted in identifying five emergent themes. The network in Figure 1 is a direct outcome of this first step. Additionally, this paper presents examples of patterns of knowledge, skills, and abilities learned in COEs so as to refer to them as competencies.

Finally, by describing some of these patterns, e.g. Pedagogical Literacy of Metacognitive Critical Thinking, scientific hypotheses emerge that may or may not confirm the unique place of COEs in the modern university.

Future Research

Future research on the connections in Figure 1 could be qualitative or quantitative. A qualitative study could replicate the multi-step process of the 60x30TX plan in non-COEs within and across universities using a variety of methods, which could triangulate this study's findings. Quantitatively, Figure 1 is testable using structural equation modelling and other regression-type analyses, which could show the strength and direction of these connections. As a counterfactual to the uniqueness of COEs and the network in Figure 1, there are conceivable situations in which a non-COE worker must be pedagogically literate, e.g. training in a business setting or giving tours at an art museum. Therefore, future research on pedagogical literacy should seek instances of pedagogical literacy in non-COE programs and, if they exist, compare their quantitative and qualitative characteristics. Finally, results from this study should be used to continue the multi-step process of collaboration between COE administrators, COE faculty, current COE students, COE graduates, and local employers outlined by the 60x30TX plan.

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