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Assessing Content Knowledge and Changes in Confidence and Anxiety Related to Economic Literacy in a Professional Development Program for History Teachers

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The purpose of this study was to determine the impact of a Teaching American History professional development program on content knowledge and confidence and anxiety associated with teaching economic literacy. Two content assessments and a confidence and anxiety instrument were administered to teachers prior to and immediately following a 2-week institute. Statistically significant findings included an increase in economics content knowledge and an increase in confidence combined with a decrease in anxiety. The scale and measurement model employed to examine status and subsequent change should be useful for similar professional development initiatives and evaluations.

Keywords: *anxiety teaching, confidence teaching, economics education, professional development, Rasch models*

Introduction

The Teaching American History (TAH) grant program was launched in 2001 for K–12 teachers. This program, the largest federal education program dedicated to U.S. history, was created with the intention of combating what was seen as an undervalued history curriculum as well as underprepared history teachers (U. S. Department of Education, 2010). In addition, results from the 2001 Nation's Report Card showed less than 20% of 4th, 8th, and 12th graders were performing at or above proficiency in U.S. history (Lapp, Grigg, & Tay-Lim, 2002). Ravitch (2011) highlighted the fact that U.S. history scores were the lowest of all of the subjects assessed by the National Assessment for Educational Progress.

Many educators felt the lack of emphasis on increasing history knowledge, understanding, and appreciation among students and teachers was due to No Child Left Behind legislation that focuses on math and reading/language arts (Stein, 2003). In addition, some schools did not even have a dedicated history curriculum but rather embedded history content into the social studies curriculum (Stein, 2003). Other reasons for the lack of emphasis on history have stressed the potential political influences that can affect the content presented in specific classrooms (Humphrey et al., 2005; Stein,

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2003). Stein (2003), for example, argued that many teachers lack content knowledge of history due to varying state requirements in terms of college majors, such as requiring only a social studies major.

Through the TAH grant program, the U. S. Department of Education expected that improving teacher knowledge, understanding, and appreciation of traditional American history would have a positive impact upon student achievement. Grants were awarded to local education agencies (school districts) that proposed innovative approaches to professional development. A key component of the grants was the inclusion of organizations with content expertise (U. S. Department of Education, 2010).

In 2007, the Hudson Public School District was awarded a 3-year TAH grant (with a subsequent 1-year extension) in conjunction with the Assabet Valley Collaborative of Massachusetts. The multiyear grant afforded American history teachers the opportunity to engage in professional development activities to improve U.S. history education for students with different topical focuses. Two of the main goals of the project were to improve history content knowledge among participants and to improve classroom pedagogy after participation in the professional development sessions.

In the fall of 2009, in the midst of a national recession, Hudson's TAH stakeholders decided that a year-long emphasis on economics content was necessary in order to encourage and help history teachers introduce and integrate economics concepts and literacy into the classroom and that this emphasis should pull from different historical periods to illustrate the concepts. This decision was in line with the growing opinion that, given increased public attention to economic issues, economics was a subject area that would undoubtedly grow (Salemi, 2005).

There was, and still is, a nationwide concern that teachers are ill-equipped to handle the additional responsibility of teaching economics content through either lack of knowledge, limited resources, inadequate professional development, or lack of interest in or heightened anxiety about the topic (Walstad, 2001; Watts, 2006). In an investigation into the effects of state mandates on teacher attitudes and the impact of both on student learning, Marlin (1991) found that state mandates on teaching economics resulted in a decrease in teacher enthusiasm (although training in economics content counteracted this) and that low enthusiasm was correlated to low student achievement.

Donaldson and Moore Johnson (2010) contributed additional insight into the potential effects of ill-equipped or uninterested teachers in their examination of retention among a national sample of Teach for America teachers. In the study, they found high turnover among teachers with more challenging assignments, such as teaching multiple grades and multiple subjects, as well as out-of-field teaching. Of particular interest is that secondary teachers who were asked to teach multiple subjects or out-of-field classes were more likely to leave teaching altogether than those who were not asked to take on these additional responsibilities (Donaldson & Moore Johnson, 2010).

This body of research points to the need for additional professional development efforts to address content areas where teachers are underprepared, such as the role and influence of economics in history. In particular, a focus on resources and ways to improve pedagogical skills is critical to better prepare teachers for the continuously evolving, complex challenges in teaching American history.

Psychosocial Factors and Professional Development

Increased content knowledge and improved pedagogical skills should not, however, be the only goals of a professional development program. As Opfer, Pedder, and Lavicza (2011) suggest, the ability of a

teacher to learn and then apply that knowledge is influenced by the teacher's beliefs and attitudes. Many studies have shown the array of psychosocial factors that can influence a teacher's ability to teach his or her students effectively (Gardner & Leak, 2009; Marlin, 1991; Nisbet, 1991; Payne & Manning, 1990; Tietjen-Smith, Balkin, & Kimbrough, 2008). For example, a teacher's locus of control can impact his or her self-esteem, anxiety level, confidence, or even learned helplessness (Payne & Manning, 1990).

Other examples point to the role of teacher attitudes with dimensions such as confidence and enjoyment, anxiety, desire for recognition, pressure to conform, and the influence of attitudes on one's ability to teach (Nisbet, 1991). For example, a telephone survey in the United Kingdom explored the role of teacher confidence in science education, expanding on a study conducted a decade earlier by Harlen in 1995 (Murphy, Neil, & Beggs, 2007). The authors found that 50% of teachers identified teacher confidence and ability to teach science as a main factor negatively impacting the subsequent quality of primary school science teaching. Their study also revealed certain factors associated with lower confidence levels, such as lack of professional development in primary science and the age of the teacher, where younger teachers reported less confidence (Murphy, Neil, & Beggs, 2007).

Anxiety, in addition to a lack of confidence, can have a negative impact on a teacher's ability to teach, especially new teachers (Payne & Manning, 1990). For example, Gardner and Leak (2009) measured teaching anxiety among psychology professors and found that 87% had experienced anxiety either anticipating teaching, preparing to teach, or actually teaching. They determined that speaking in front of a class, preparing for class, receiving hostile comments from students, and providing insufficient answers to students' questions were common anxiety-provoking triggers.

Combining the above separate-but-complementary bodies of teacher-preparation research points to the need to not only focus professional development efforts on improving content knowledge and providing resources and practice skills for the classroom, but also to ensure participants' attitudes are taken into account. If a teacher learns new material but is not confident or comfortable presenting the new information to students, the outcomes of a professional development intervention may not be maximized (e.g., student achievement).

The Intervention

The year-long focus on economics literacy included an all-day workshop held in the fall at a local high school, a tour and activities at the Federal Reserve Bank of Boston in late winter, and an intensive 2-week "Summer Institute" in 2010 entitled *Examining U.S. History Through an Economic Lens*. This institute for teachers of American history was designed to ultimately introduce, enhance, and expand their K–12 students' economic literacy. While there may be varying definitions, economic literacy is commonly defined as the understanding and application of basic economic concepts to real-life situations (not just classroom-based; Salemi, 2005). The emphasis extends beyond simply recognizing and defining common economic terms.

During the institute, teachers met 10 times for approximately 8 hours a day. Each day consisted of a different agenda and set of activities ranging from lectures, workshops including hands-on activities, and field trips. Trips included day visits to the Old Sturbridge Village in Sturbridge, Massachusetts, and the Salem Maritime National Historic Site. Institute organizers were cognizant of the range of grades taught by teachers and tried to provide a variety of topics presented at different levels to engage all participants. Topics included how government has shaped the American economy, the

nature of different cycles of American business history, and the general circumstances leading to the Great Depression. This institute provided opportunities for K–12 teachers to learn from and interact with local teachers and scholars from institutions such as Salem State College, the University of Connecticut, the College of the Holy Cross, and Worcester State College. In addition, they were able to network with peers while developing and sharing their content knowledge and teaching practices.

It was important to the institute's developers that the scope be crafted to address the needs of Massachusetts teachers working with state and national American history and economics frameworks. In addition, prior to the institute, participants were asked to identify their expectations for the sessions. Themes ranged from increased knowledge and practice, better preparation in the classroom, sources of reference materials, guides for appropriate economics exercises, and advice on how to develop a general enjoyment of the content.

Not unexpectedly, many teachers expressed serious misgivings about studying economics—practical or not—and their ability to teach content they were not trained in, not necessarily interested in, and uncomfortable even thinking about. The TAH staff and evaluation team were well aware of overt teacher anxiety associated with this topic. Teachers' concerns were expressed when the institute program was first advertised and at events leading up to, and even during, the Summer Institute.

These concerns prompted the work reported in the present article. Specifically, most professional development interventions focus on increased content knowledge or skill transfers but may not assess psychosocial factors such as teacher confidence and anxiety. Hence, the purpose of the present study was to assess not just the extent to which teachers gained content knowledge through the TAH Summer Institute but, equally as important, the extent to which they experienced significant psychosocial change (i.e., increased confidence and decreased anxiety) with respect to teaching economic literacy.

Method

Participants

Forty-four teachers participated in the Summer Institute, although attendance varied slightly each day. TAH teachers were primarily based in Middlesex County, Massachusetts, and taught varying grade levels with different levels of American history teaching experience, professional preparation, and exposure to economic concepts. They received graduate credit or professional development points as well as stipends for their participation.

Measures

While the TAH evaluation included multiple standard data collection instruments and mixed-methods approaches, this study focuses on two: the pre–post content knowledge tests and the *Teaching Economic Literacy: Confidence and Anxiety* (*TELCA*) scale (Ludlow, Rollison, Cronin, & Wallingford, 2012). These instruments were researcher-developed specifically for the Summer Institute's focus on economics within history education.

Content Tests

Two tests of economic terms, principles, history, and issues were based on typical classical test theory procedures and were administered before and after their respective institute sessions. One test focused on *Economics and Labor* while the other focused on *Economics and Government*.

The majority of the items resulted from the solicitation of questions related to the content that the faculty leading the sessions at the institute presented. The TAH project director also reviewed the National Assessment of Educational Progress history section but did not find suitable questions related to economics. In addition, the curriculum director at Hudson Public Schools used test sources to supplement gaps in coverage. All items were multiple-choice format. The Cronbach alpha for the 20 *Economics and Government* posttest items was 0.815 while the alpha for the 20 *Economics and Labor* posttest items was 0.757. All item discriminations were positive. The tests were reviewed by the institute faculty and program staff and were considered content valid for the purposes of the institute.

TELCA

The TELCA instrument was developed to measure two independent aspects of teaching a new subject (in this case, economics literacy): *confidence* and *anxiety*. The intention was to add an affective measure to the Summer Institute and, if successful as a measurement tool, influence future affective assessment initiatives supported through the TAH program. The instrument included items selected and altered from existing scales as well as a broad set of researcher-developed items written based on an analysis of observations and interviews collected during an earlier TAH workshop.

TELCA's specific purpose was to measure status and subsequent changes in anxiety and confidence levels among teachers after they participated in the institute. The instrument presented in Table 1 contains 30 items with 18 that address teacher confidence and 12 that address teacher anxiety. All items relate to some aspect of teaching economic literacy. Teachers respond on a 5-point Likert scale (1 = *Strongly Disagree*; 2 = *Disagree*; 3 = *Uncertain*; 4 = *Agree*; 5 = *Strongly Agree*). A high score on the confidence scale (maximum is 90) indicates a higher (favorable) level of confidence teaching the subject. A high score on the anxiety scale (maximum is 60) indicates a higher (unfavorable) level of teaching anxiety.

Table 1: *List of TELCA Instrument Items*

TELCA Items
C1: I feel certain when deciding how to present new information about economics concepts in the classroom.
C2: I feel a definite positive reaction when I teach economics topics.
C3 :Incorporating economics concepts into my lessons is enjoyable for me.
C4: I feel confident when I come across a complex concept in economics that I have to incorporate into my lesson.
C5: When I am confronted with teaching a new concept in economics, I know I can cope with it.
C6: I am confident about the methods of teaching economics concepts.
C7: I have a lot of self-confidence when it comes to planning lessons that incorporate economics topics.
C8: I love teaching economics concepts in my classes.
C9: I feel at ease explaining economics concepts.
C10: I enjoy the challenge of teaching economics concepts.
C11: The idea of teaching new economics concepts in my classes is exciting to me.
C12: I feel confident in my ability to improvise during a lesson involving economics.
C13: When thinking about economics topics that I am going to incorporate into my lessons, I am confident that I will explain the material clearly.
C14: I'm the type of teacher who can teach economics concepts very well.
C15: I would feel calm if the principal observed in my classroom while I was teaching a lesson that incorporated economics topics.
C16: I feel secure about incorporating simple economics concepts into my lessons.
C17: I can create lively and engaging discussions about economics issues.
C18: I can keep the students interested in the economics concepts that I teach.
A19: It makes me nervous when I simply think about incorporating economics topics in my lessons.
A20: The thought of incorporating complex topics about economics into my lessons scares me.
A21: I am panicked when a student asks me an economics question that I can't answer.
A22: Thinking about teaching economics topics makes me depressed.
A23: When teaching economic concepts, my heart begins to beat faster.
A24: Thinking about teaching economics topics makes me anxious.
A25: Teaching economics concepts makes me restless, irritable, or impatient.
A26: Worrying about teaching economics topics makes me exhausted.

Note: C = confidence; A = anxiety.

Psychometric analyses based on classical test theory and Rasch item response theory support the use of the TELCA instrument to independently assess confidence and anxiety in teaching economic literacy (see Ludlow et al., 2012, for the technical details). A factor analysis extracted two factors that accounted for 64.2% of the common variance (Ludlow et al., 2012). The Cronbach alpha was 0.954 for the confidence scale, while the anxiety scale alpha was 0.951. The two scales possess an expected negative relationship ($r = -0.65$, $p < .01$), and each defines a unidimensional continuum of items that measures attitudes ranging from lesser to greater confidence and lesser to greater anxiety associated with teaching economic literacy, respectively (Ludlow et al., 2012).

Data Collection

Teachers completed the *Economics and Government* test prior to Week 1, while the *Economics and Labor* test was administered at the beginning of Week 2. Each test was administered again at the conclusion of the respective week. No personal identifying information was collected, although participants were asked to create a fake identification number or name in order to match their pre- and posttest responses.

Fifty-one teachers responded to the TELCA instrument in April 2010. The postadministration consisted of 31 teachers after Week 2 of the institute. No identifying information was collected, although, similar to above, participants were asked to use a fake identification number or name to link responses.

Results

Content Knowledge Tests

Twenty-nine pretest scores could be linked to posttest scores for the teachers who took the *Economics and Government* content test. The mean pretest score was 10.97 out of 20; the posttest score mean was 12.55. Twenty-one of the pretest and posttest *Economics and Labor* scores could be linked. The mean pretest score was 12.43 out of 20; the posttest mean was 14.19. Using a paired-sample *t*-test, there was a statistically significant increase in scores from the pretest to the posttest on both of the content tests ($p < .05$).

With these results, the Summer Institute on economics literacy could be considered a success. That is, teacher content knowledge increased and anecdotal evidence showed that classroom practices were explored, resources and materials were discovered, and lesson plans were developed for the coming academic year. Fortunately, the TAH staff and evaluation team had early on seen the significance of addressing and measuring teacher levels of confidence and anxiety. The remainder of this paper focuses on the confidence and anxiety results.

Confidence and Anxiety

As noted earlier, the construction of the two TELCA scales makes use of Rasch measurement principles (Wright & Stone, 1979). These principles often provide a more powerful and informative measurement approach than standard classical test theory procedures for assessing programmatic change. (See Ludlow et al., 2012, for greater elaboration on these principles.) Although it is critical to see a statistically significant change in the averages of pretest and posttest scores in any program intervention such as the one reported in this article, it is equally important to understand what

those changes mean in practical substantive terms. For example, a 2-point change in content scores represents two more items answered correctly, but a 10-point change, say, in confidence or anxiety, although statistically significant, may be unclear in terms of what the attitude shift means because the items are scored with 5-point Likert response options.

The discussion that follows addresses this interpretation limitation by illustrating a measurement methodology that graphically represents changes in confidence and anxiety levels. This capability to understand change in terms of substantive differences offers a tremendous opportunity to pinpoint problems and their subsequent resolution.

The Rasch rating scale item response theory model (Andrich, 1988; Wright & Masters, 1982) was used with these data because the response categories are polytomous. This model includes a parameter estimate for each teacher's attitude level with respect to his or her level of teaching confidence and anxiety, respectively. In addition, the model estimates the difficulty of endorsing (i.e., strongly agree with) each item and a transition estimate associated with moving from one response category to the next highest one (e.g. from *Agree* to *Strongly Agree*). These teacher, item, and category estimates are in a logit metric (Ludlow & Haley, 1995; Wright & Stone, 1979), which is extremely useful for simultaneously portraying in a variable map the unidimensional continua of items that operationally define the confidence and anxiety scales and the subsequent substantive meaning of the location of each teacher on each of these scales.

Twenty-one teachers had consistent identification numbers or names on both of the two scales' pre- and posttest administrations. Figure 1 contains the variable map for the 21 pairs of pre and post teacher confidence attitude level estimates and the 18 item confidence difficulty estimates. Figure 2 contains the corresponding variable map for anxiety. Technically, prior to estimating the pre- and postintervention teacher confidence and anxiety levels, each of the two scales were anchored based on their respective item difficulty and category transition estimates from the original measurement study reported in Ludlow et al. (2012). The WINSTEPS software package (Wright & Linacre, 1998, Version 3.71.0) performed the analyses.

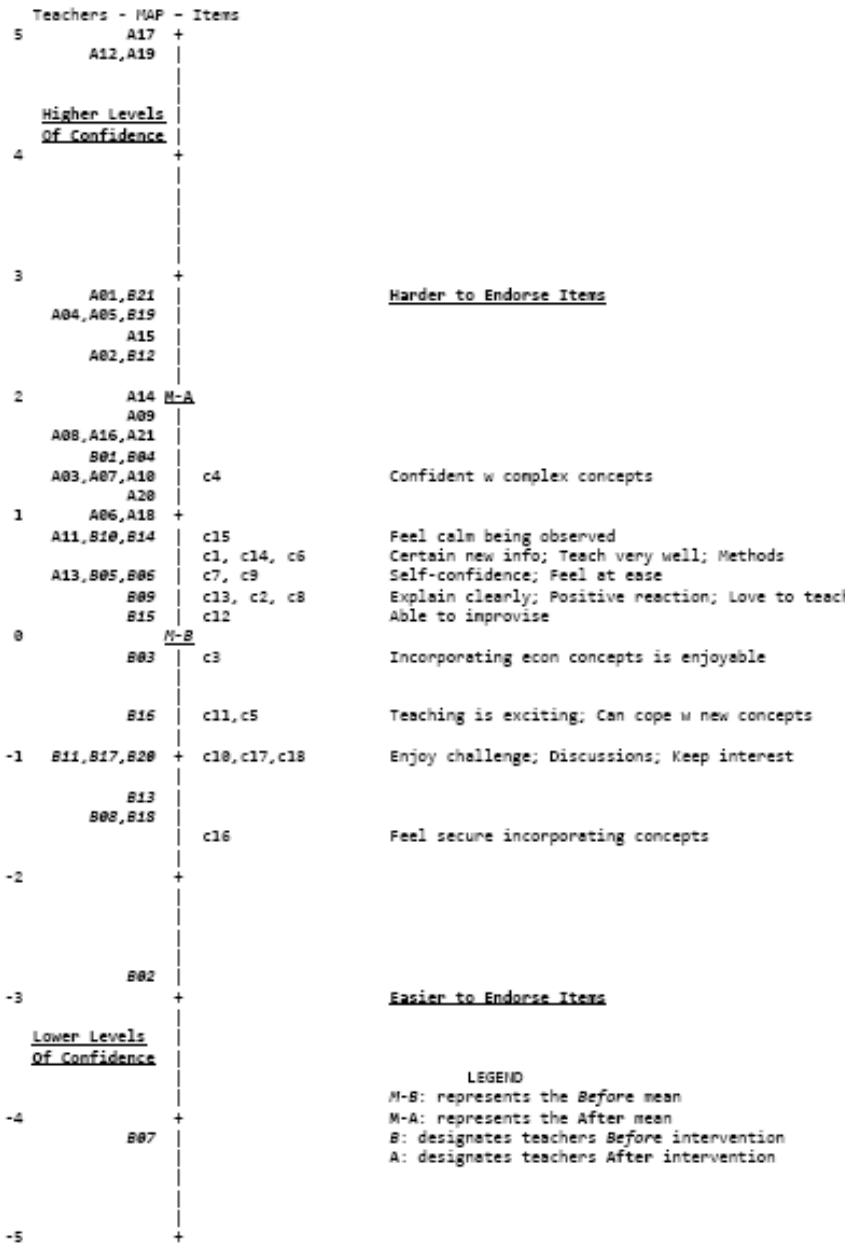

Figure 1: *Teaching Economic Literacy: Confidence Scale*

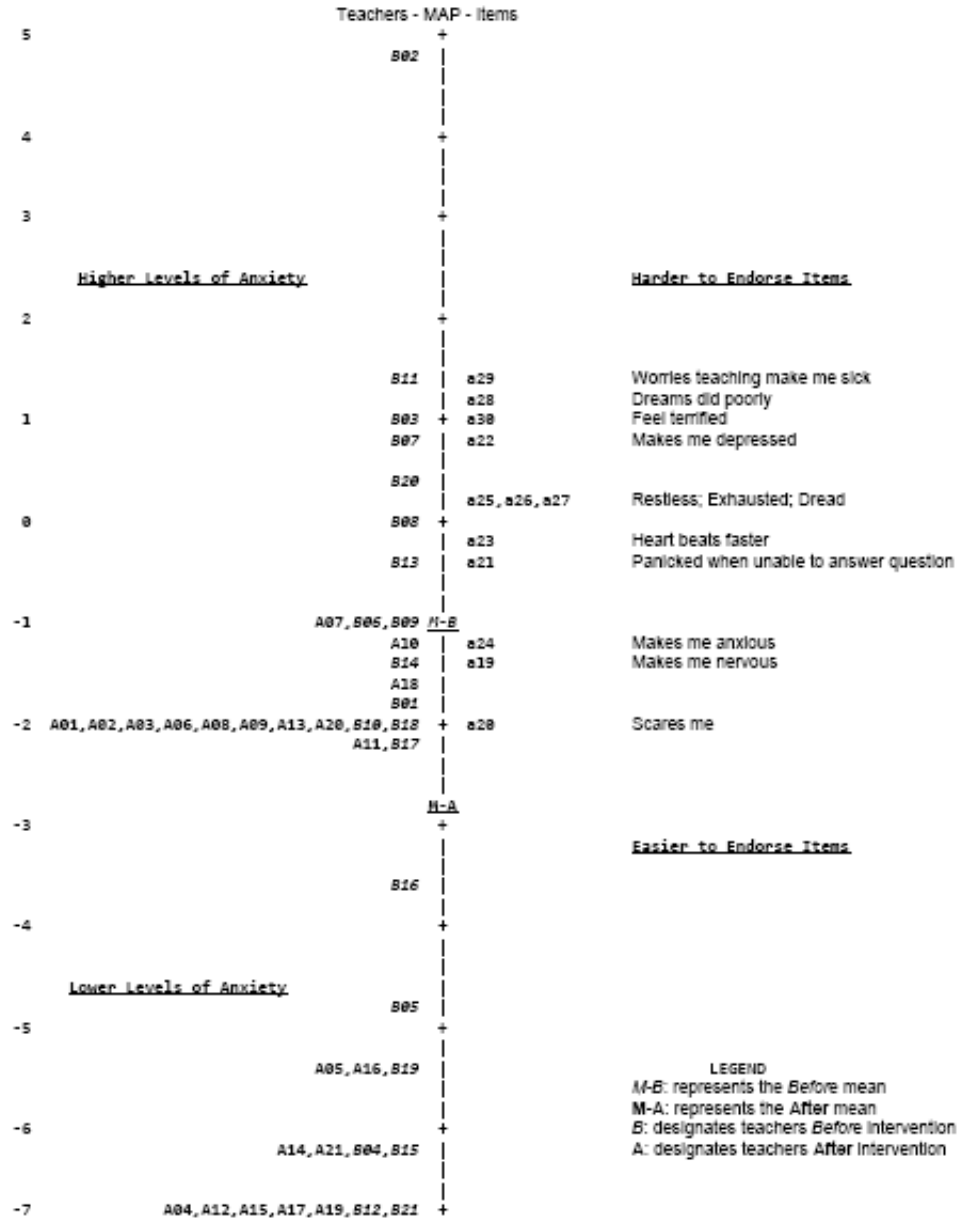

Figure 2: *Teaching Economic Literacy: Anxiety Scale*

These graphical representations reveal the substantive meaning of the confidence and anxiety constructs. More specifically, these variable maps show what it means in terms of items likely to be endorsed by low-scoring teachers (whether they are low on confidence or low on anxiety) versus the items likely to be endorsed by high-scoring teachers. Furthermore, these maps show what it means to progress from one end of a scale's continuum to the other. That is, in each map, the items are ordered from easiest to endorse (bottom of the map) to hardest to endorse. The teachers are likewise ordered from lowest scoring (bottom of the map) to highest scoring. These orderings mean that teachers located at the top of the variable maps are the ones who responded *Strongly Agree* on most of the items. Likewise, teachers at the bottom of the maps are the ones who frequently responded *Strongly Disagree*.

Individual preintervention teacher attitude levels (or locations along the scales) are represented with the prefix *B*, while postintervention attitude levels are represented with *A*. In terms of confidence, a positive change is represented by a teacher scoring higher after the institute and, hence, moving up the confidence scale. This means that most of the preintervention *B* locations should be in the lower left section of the Figure 1 map, while the *A* locations should be mostly higher up the scale. In contrast, a positive change in anxiety for a teacher is represented by a postintervention lower score that results in movement down the anxiety scale. This means that most of the preintervention *B* locations should be in the upper left section of the Figure 2 map, while the *A* locations should be lower along the scale. These graphical representations are indispensible when trying to establish a scale's construct validity, a teacher's current status with respect to the scale, and what a change in a teacher's attitude means.

As demonstrated by the easiest-to-endorse confidence items, it is easiest to strongly agree with items C16, C10, C17, and C18 (feeling secure about incorporating simple economic concepts; enjoying the challenge of teaching economic concepts; able to create lively and engaging discussions around economic issues; can keep students interested in economic concepts), followed by items C11 and C5 (idea of teaching new economics concepts is exciting; able to cope when confronted with teaching a new concept). These items all address relatively general teaching practices that might apply to any new subject.

In the middle of the distribution are affective items C3, C12, C13, C2, and C8 (incorporating economics is enjoyable for me; I feel confident in my ability to improvise; I am confident I will be able to explain material clearly; I feel a positive reaction when I teach economic topics; I love teaching economics in my classes). Alongside and somewhat higher up the confidence scale are C7, C9, C1, C14, and C6 (I have a lot of self-confidence; I feel at ease explaining concepts; I feel certain when deciding how to present new information; I'm the type of teacher who can teach economics well; I am confident about the methods of teaching economic concepts). These items address relatively specific teaching practices.

The most difficult items to strongly endorse are C15 and C4 (would feel calm while observed teaching economics; confident incorporating complex economic topics into my lesson). These higher-level (i.e., difficult) items require specialized knowledge of economics and teaching practice.

The confidence scale was designed to capture a continuum of relatively commonplace to relatively challenging teaching practices requiring greater specialization and deeper content knowledge. Along this continuum, most teachers, whether pre- or postintervention, would have some reasonably high expectation of expressing confidence in accomplishing the general tasks, while fewer teachers would express high confidence accomplishing the more specialized tasks. It is encouraging and consistent with our scale-development expectations that the empirical results represented in Figure 1 confirm that proceeding up the confidence scale means addressing increasingly more complex teaching economics situations.

The results from the postintervention (*A* locations) reveal a dramatic difference in the distribution of confidence level estimates in comparison with the results of the preintervention (*B* locations). That is, there are substantially higher levels of endorsement of items indicating more confidence for candidates after the institute relative to levels before the institute. In fact, the location of the mean score on the confidence items before the institute (*M-B*) corresponds to agreement with the items previously described as the relatively general teaching practices. After the institute, the mean score (*M-A*) location corresponds to agreement with accomplishing the more specialized and complex economics tasks. This visual interpretation of the teachers' changes along the variable map is supported by a paired-sample *t*-test: the postintervention mean (*M-A* = 72.24) was statistically significantly higher ($p < .001$) than the preintervention mean (*M-B* = 54.48).

Furthermore, this overall change in mean level of confidence is personalized when individual teachers are highlighted. For example, the teacher identified as B07 essentially strongly disagreed with every confidence item prior to the institute (total score = 23, logit = -4.20), but after the institute, the same teacher (now identified as A07) reported calm, confidence, ease, and enjoyment (total score = 68, logit = 1.41).

The anxiety scale presented in Figure 2 was designed to capture a continuum of feelings and concerns that ranged from relatively common reactions about teaching economics topics to relatively extreme, even debilitating, reactions. Specifically, it was assumed that feeling anxious and nervous about teaching economics would be relatively common (most teachers would endorse these items); feeling exhausted, irritable and restless would be less common (fewer teachers would endorse them); and becoming depressed and physically sick would be relatively rare (only the most highly anxious teacher would experience these reactions). This expectation drew heavily from previous work with academic anxiety measures (see, for example, Ludlow & Guida, 1991).

The easiest-to-strongly-agree-with anxiety items are A20, A19, and A24 (thought of incorporating complex topics scares me; makes me nervous thinking about incorporating economics into my lessons; thinking about economic topics makes me anxious). These are relatively commonplace feelings about a topic associated with mathematics, statistics, and equations.

Those items are followed by the cluster of A21, A23, A25, A26, and A27 (panicked when asked a question I can't answer; heart begins to beat faster when teaching economics; teaching economics makes me restless, irritable, or impatient; worrying about teaching makes me exhausted; I approach teaching economics with dread). These items address physical reactions associated with unease and discomfort.

The hardest-to-endorse anxiety items are A22, A30, A28, and A29 (thinking about economics makes me depressed; I feel terrified when teaching economic concepts; I have dreams I did poorly

explaining economic concepts; worries about teaching economics make me sick). These items address symptoms of a possible debilitating and destructive nature.

This structural continuum, or operational definition of the anxiety scale, is consistent with our scale-development intentions that positive change, represented by proceeding down the scale's continuum, would mean experiencing increasingly less intense and problematic physical and psychological anxiety-associated reactions towards teaching economic literacy.

This variable map also shows the change in responses before and after the institute's professional development sessions. The postintervention (*A*) scores reveal a dramatic downward shift in the distribution of anxiety levels in comparison to the preintervention scores (*B*). Before the institute, the high mean score (*M-B*) location corresponds to feeling uncertain and perhaps agreeing with the debilitating and physical reaction items while strongly agreeing with the commonplace ones. After the institute, the lower mean score (*M-A*) location corresponds to strongly disagreeing with the debilitating items, disagreeing with the physical reaction items, and mildly agreeing or being uncertain about the commonplace ones. A paired-sample *t*-test supports these interpretations: there was a statistically significant drop ($p < .002$) from the preintervention mean ($M\text{-}B = 27.19$) to the postintervention mean ($M\text{-}A = 19.67$).

Finally, it is instructive to understand these changes by using the same teacher identified in the confidence analysis. Teacher B07, who scored lowest on the confidence scale, scored not surprisingly among the highest on the anxiety scale. This teacher's location corresponds to agree or strongly agree with all the anxiety items (total score = 41, logit = 0.79). After the institute, the location of this teacher (now A07) was lower on the continuum and corresponded to disagreeing with the debilitating items, while still feeling some physical reactions and still feeling nervous and anxious (total score = 30, logit = -0.91). This teacher's changes in confidence and anxiety are well-illustrated by qualitative data supplied through two optional open-ended items that elicited additional insight into changes experienced after the institute from all participants.

> "I realized how uneasy I am with teaching economics. I have little background, little confidence, and no resources of my own (e.g., books, etc.)."
>
> "I feel much less anxious about teaching and incorporating these concepts! Especially after 2 weeks!"

Discussion

The 2010 Hudson Public School District's TAH Summer Institute demonstrated an increase in teachers' content knowledge in the areas of *Economics and Government* and *Economics and Labor*. The institute was also successful in increasing confidence and decreasing anxiety associated with teaching economic literacy. In addition, other available data gathered through feedback forms, ad-hoc interviews of individual participants, and review of teacher-developed projects for college credit all supported the conclusion that some, if not all, teachers transferred the pedagogy to their classrooms.

The present results help stress the importance of both knowledge and affect in terms of improving a teacher's ability to teach and, in turn, a student's ability to learn. These results reinforce the need to not only focus professional development efforts on improving content knowledge, but to also ensure participants' attitudes are taken into account. The measurement approach used here was unique in

that the assessment instrument was the first of its kind to focus on attitudes towards teaching economic literacy applicable to the K–12 range. Other instruments measuring confidence or anxiety, rarely both, have focused on very specific economics content. For example, Finkelstein et al. (2010) developed a scale to assess confidence in teaching economic concepts. Their scale focused on specific economic concepts, such as opportunity costs and monetary policy, and asked specifically about how confident they were for each concept area but not on general concepts. By tracking these types of attitudinal outcomes of professional development programs more systematically, other TAH grantees and the field of education in general can benefit.

As noted above, if a teacher learns new material but is not confident or comfortable teaching the new information to students, the outcomes of the professional development program are not maximized. The present measurement approach and subsequent findings for the TAH program are compelling given rising demands for history education in the United States and an increased focus on economic literacy. As core standards begin to evolve and curriculums are altered, teachers will potentially be faced with increased responsibility in being asked to teach out of their field or in an area where they have not had adequate training.

There were several limitations to this study. First, teachers were asked to provide a fake name or identification number that they were expected to remember several months later in order to link pre–post responses. Many, however, did not use consistent identifiers, which then resulted in missing data. Second, contextual information was not collected from the teachers; therefore, factors that could have influenced responses to items such as gender, familiarity with economic concepts, and associated grade level were not assessed. Nevertheless, given the important implications of increasing confidence and reducing anxiety for teachers, measuring these variables well is critical to ensuring that professional development efforts in subject-specific pedagogy are data-driven and teacher-specific, not anecdotal or simply externally mandated.

Although future research is warranted in order to better estimate whether the effects of the intervention were sustained beyond the intervention period, this particular American history professional development model is promising in effecting psychosocial change while increasing content knowledge. Furthermore, the approach to measuring status and subsequent change, particularly through the TELCA scale and the Rasch measurement model employed, should be useful for similar professional development initiatives and evaluations.

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