PREPARING ECONOMIC EDUCATORS FOR A NEW ERA: AN INTERDISCIPLINARY MODEL YIELDS TEACHER AND STUDENT GAINS

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ABSTRACT

This study examines the effectiveness of a three-year Masters of Economics Education program developed and delivered through an interdisciplinary partnership between a Northwest University's College of Business and College of Education. The research on the Idaho Economic Fellows Institute clearly supports this format of teacher preparation and/or professional development. Specifically the research showed that the program increased fellows' economic literacy and positively affected the fellows' teaching skills and techniques. There is also strong evidence that the institute influenced the economic content being taught by fellows as well as their students' success on standardized tests.

Researchers employed a mixed method approach to data collection, relying on standardized pre-post tests developed and validated by the National Council on Economic Education as well as instruments developed and validated by the authors.

INTRODUCTION

The call for reform in public education has been coupled with calls for reform in teacher preparation. In the current era of standards and high stakes testing, teachers' knowledge, skills and dispositions continue to be seen as a critical factor in student learning. The 1996 report *What Matters Most: Teaching for America's Future* (National Commission on Teaching

and America's Future) reiterates that teaching and quality teacher preparation are crucial for successful school reform. Hermanowicz, (1991) in reviewing recommendations for reform in the context of economics education states that "It is unconscionable … to continue, without correction, programs and practices that produce teachers who themselves have insufficient knowledge in economics" (p. 78). Reforming the process for educating pre-service teachers is just one concern. There is also a need to study and test new models of professional development for experienced teachers. As a result of the work of the National Council on Economic Education (NCEE) and its partnerships with universities, corporations, foundations and professional associations, economics educators, and teacher educators are in a position to rethink the ways in which teachers learn economics and economics pedagogy. The NCEE partnerships have spawned 49 state economics councils and 275 university centers for Economic Education to provide professional development opportunities for teachers. It is in the context of university centers exploring and validating new teacher education models that this article is written.

This study examines the effectiveness of a three-year Masters of Economics Education program sponsored by Idaho's Council for Economic Education and developed and delivered through an interdisciplinary partnership between the host university's College of Business and College of Education. This study was designed to provide formative assessment of the program so that professors and program developers could adjust the curriculum as necessary, to identify the program's impact on participating teachers' (called Fellows) economic literacy and pedagogy and to determine if the program of study affected participants' K-12 students' economic understanding.

BACKGROUND

A review of economics education literature indicates that the amount of economics coursework that a teacher has can impact students' economic knowledge. Walstad and Soper (1988a) find a positive and significant impact of teacher course work on the performance of students on the Test of

Economic Literacy (TEL). Furthermore, Lynch (1990) reports that "Not only do students learn more when their teachers have more training, but economics students whose teachers have had few courses may not learn any macro economics or international economics" (p. 295). The program was designed to better prepare teachers of economics and social studies to adequately develop the economic literacy of Idaho's K-12 students.

Allgood and Walstad (1999) studied practicing teachers enrolled in an innovative three-summer graduate program in economic education at the University of Nebraska and found that the participants gained in economic understanding, thought more like economists than traditional social studies teachers, and that the participants' economic understanding positively influenced student learning of economics. While the authors conclude by noting "the results suggest that intensive and lengthy instruction in economics for teachers has a long-term payoff in economic understanding for both teachers and students" (p. 109), their measure of improved economic understanding was limited to 232 students in 12 teachers' classes over the course of one semester. This study described herein more thoroughly documents these effects by tracking changes in student economic literacy over a three-year period, involving 3501 students.

For an Idaho teacher to be certified in social studies, the most common certification in the state for economics teachers, Idaho requires only two university courses in economics content. In looking at how Idaho economics teachers are educated, Jenkins and Nelson (2000) surveyed 368 Idaho educators to determine the preferred types of teacher training and the methodology used in economic education programs. Graduate university courses were rated as the most useful type of training for the integration of economics into the K-12 curriculum. The authors call for increased opportunities in Idaho for economics education, as well as a continuing effort to develop hands-on and engaging instructional strategies.

IDAHO ECONOMIC FELLOWS INSTITUTE

The Idaho Economic Fellows Institute was conducted at Boise State University from the summer of 1999 through the spring of 2002. The

Institute was modeled after a similar one conducted at the University of Nebraska 1993-1996. (Allgood and Walstad, 1999). The Idaho Institute offered Fellows 30 semester hours of graduate credit courses in three six-week summer sessions. The Fellows also earned nine hours of independent study credits during the school years, which gave Fellows the opportunity to develop curriculum units and engage in action research within their own classrooms. In each of the summers, Fellows were enrolled in two credits of pedagogy course work and six credits of economics course work. During the first summer, Fellows completed course work in macroeconomics, microeconomics, and instructional theory. In the second summer, Fellows completed course work in financial markets, industrial organization, and instructional and assessment practices. During the third summer, they enrolled in a course focusing on international economics and a course co-taught by education and economics professors that examined Fellows' instructional strategies for teaching economic analysis. While the master's degree coursework was interdisciplinary in nature, upon the completion of a thesis, fellows receive a Master of Arts in economics from the College of Business.

During summer course work, Fellows resided in university housing and participated in informal and organized social events. To counter what Goodlad (1990) described as "the social, intellectual, professional isolation of teachers (which) begins … in teacher education" (p.700), Institute organizers were deliberate in developing a cohort atmosphere that allowed Fellows to support each other to the extent that communication about professional matters between the Fellows would continue beyond their participation in the university classroom.

Thirty-one of the 35 teachers enrolled in the program completed the final academic year of the Institute. Twenty-five Fellows were secondary economics teachers, four were junior high or middle school teachers and two teach in elementary schools. Twenty-three of the Fellows had less than ten years experience, while eight had ten or more years. The prior economics education of the Fellows varied widely from no courses to a bachelor's degree including nine economics classes.

LIMITATIONS

The design of this study has two fundamental limitations. First, when measuring the economic literacy of the participating teachers, the same form of the Test of Understanding in College Economics (*TUCE*) was administered. As a result of annual administration the *TUCE*, participating teachers may have become "test wise" (Popham, 1993, p. 222). This may have contributed to the *TUCE* gains observed during the study. Among the student sample, different students were tested each year within teachers' classes. While this may weaken claims about the long-term effect on students' economic literacy, the multiple years of administration and large sample size mitigate this threat to validity.

FINDINGS

The evaluation of the Idaho Economic Fellows Institute was conducted in an iterative fashion during its three years of operation. Because of the mixed-method approach to data collection from a variety of sources, the authors describe below the relevant methodology employed within each portion of the evaluation study. To provide formative feedback to program providers as well as to conduct a summative evaluation of the impact on participant and K-12 student learning, multiple data sources were pursued to document each of the following: 1) development of economic literacy among the Fellows, 2) development of economic literacy among Fellows' K-12 students, 3) pedagogical repertoire of the Fellows, and 4) overall quality of Idaho Economic Fellows Institute. Each of the above items will be addressed and explained in detail in the following sections.

Fellows' Economic Literacy

To measure the economic literacy of the Fellows, we administered Form A of the Test of Understanding in College Economics (*TUCE*) three times over the three years of the Institute with the first administration being prior to the beginning of the first summer of coursework. The *TUCE*,

comprised of two 33-item selected-response assessments, one each for macroeconomics and microeconomics, sufficiently measured the wide range of abilities within the cohort, allowing us to measure differing levels of student growth. Similarly, Walstad (1984) and Allgood & Walstad (1999) report its validity when used in manners similar to this study.

Macroeconomics *TUCE*

Fellows' mean scores on the macroeconomics *TUCE* increased during each of the follow-up years. Whereas the majority of the improvement in mean scores occurred in the second year of the Institute, the overall improvement of scores was statistically significant $t(28) = 5.97$, $p < .001$. Of more relevant use to practitioners may be the overall effect size of 0.92, which indicates that the average Fellow's post scores are almost one standard deviation higher than at his\her entrance to the Institute. When using the *TUCE* national norms, the mean normed percentile score of the Fellows increased 34 percentiles from the 47th to the 81st percentile (See Table 1).

Table 1: Participants' Macroeconomics *TUCE* Scores (33 items)

Year of Institute	N	Mean	Std Dev	Percentile
Summer 1999	29	14.00	6.41	47th
Summer 2000	30	19.17	5.75	78th
Summer 2001	31	19.97	6.00	81st

Microeconomics *TUCE*

Fellows' mean scores on the microeconomics *TUCE* also increased during each of the follow-up years. Each year's scores were significantly higher than those of the previous year. The overall improvement in scores was statistically significant $t(29) = 5.51$, $p < .001$. The overall effect size of 0.69 indicates that the average Fellows' post scores were substantially higher than at his entrance to the Institute. When using the *TUCE* national norms,

the mean normed percentile score of the Fellows increased 19 percentiles from the 54th to the 73rd percentile (See Table 2).

Table 2: Participants' Microeconomics *TUCE* Scores (33 items)

Year of Institute	N	Mean	Std Dev	Percentile
Summer 1999	29	17.00	5.61	54th
Summer 2000	30	19.60	5.38	67th
Summer 2001	31	20.97	5.02	73rd

Fellows' prior economic training (as measured by university-level classes taken) was strongly correlated with their initial performance on the *TUCE* tests (See Table 3). That is, the more economics coursework individuals had, the better they scored on the initial *TUCE* exam. Participation in the Institute, however, weakened this advantage substantially. Specifically, when examining each of the *TUCE* exams (microeconomics and macroeconomics), we find an interesting phenomenon. While the correlation (r = .686) of prior coursework in economics was strongest for the first macroeconomics test, given in 1999, the correlation (r = .257) of the 2001 scores was not statistically significant. When examining the correlations for microeconomics the correlation across the two years remains significant, however, it does weaken. Further study is required to understand the differential effect of the Institute on Fellows' test scores.

Table 3: Correlation of University Classes Taken to *TUCE* Scores

Subject Area (Year of test)	Correlation (r)	p
Macroeconomics (1999)	.686	< .01
Macroeconomics (2001)	.257	ns
Microeconomics (1999)	.646	< .01
Microeconomics (2001)	.518	< .01

K-12 Student Achievement

To measure the economic literacy gains of the Fellows' students in grades 5-12, we used grade-level-appropriate corollaries to the *TUCE*. Because Fellows' class enrollments changed each year, the research did not follow longitudinal gains of individual students but rather examined achievement levels of fellows' successive classes. These assessments included the Test of Economic Literacy (TEL) for grades 10-12, the Test of Economic Knowledge (TEK) for grades 7-9, and the Basic Economics Test (BET) for grades 5 and 6. All test forms are normed and published by the National Council on Economic Education.

Mean student test scores improved each year the tests were administered. The overall improvement for each of the three tests was also statistically significant (TEL: $z = 21.93$, $p < .01$, TEK: $z = 2.96$, $p < .01$, BET: $z = 6.26$, $p < .01$), and substantial effect sizes (TEL: ES = 1.31, TEK: ES = 0.34, BET: ES = 1.55) indicate the practical significance of the results. As Fellow's progressed through the program, their students' success on standardized economic tests increased. Because each test has a different number of items, we also report the nationally normed percentile scores in the tables below (See tables 4-6).

Table 4: TEL Scores of Students in Grades 10-12 (46 items)

School Year	N	Mean	Std Dev	Percentile
1998 / 1999	1058	19.67	5.90	48th
1999 / 2000	812	22.69	6.97	59th
2000 / 2001	417	24.95	6.57	67th
2001 / 2002	430	27.61	6.49	75th

Table 5: TEK Scores of Students in Grades 7-9 (39 items)				
School Year	N	Mean	Std Dev	Percentile
1998 / 1999	159	17.23	5.25	53rd
1999 / 2000	358	17.67	6.58	55th
2001 / 2002	157	19.28	6.90	63rd

Table 6: BET Scores of Students in Grades 5-6 (29 items)				
School Year	N	Mean	Std Dev	Percentile
1998 / 1999	45	14.49	4.72	38th
1999 / 2000	45	16.84	4.28	53rd
2001 / 2002	20	21.25	3.54	78th

Table 4 clearly demonstrates the improvement in economic literacy among the high school students of the Idaho Fellows. The growth of 27 percentiles over three years yields an effect size of 1.31. The data suggests that as Fellows' knowledge and/or understanding increased so did their ability to better facilitate their students' economic understanding resulting in increased student gains on standardized tests. At the elementary level, it appears that students are learning much more, but the small sample size limits our ability to make strong claims regarding the significance of their growth. The middle school students demonstrate the least growth, but they appear to be making steady improvement. Once again, a smaller sample size limits our ability to draw any firm conclusions about their achievement, or lack thereof.

Teachers' Pedagogical Repertoire

To assess the pedagogical repertoire of the Fellows, we administered two instruments. The first is a series of surveys (comfort surveys) in which

teachers report their comfort with various concepts and skills in both economics and pedagogy. The Fellows reported comfort on a 4-point Likert scale: 4-Very comfortable, 3-Comfortable, 2-Uncomfortable, and 1-Very uncomfortable. The second series of surveys (change-in-practice surveys) asked Fellows to report the affect of their participation in the Institute on treatment of economic principles in their own classrooms. Fellows indicated whether economic concepts were newly added to their classroom curriculum, whether their treatment of specific economic concepts was enhanced, or whether their practice was unchanged as a result of their participation in the Institute.

Teachers' Comfort as an Indicator of Economic Literacy

The Economic Fellows program participants completed comfort surveys immediately before each summer Institute and again two months after their summer sessions. Curriculum goals, as stated in course syllabi, were used to identify concepts considered on the comfort surveys. Prior to the beginning of each summer session, professors validated the list of concepts to be taught in their courses. The 1999 comfort surveys measured the teachers' comfort level for macroeconomics concepts, microeconomic concepts, and pedagogy, using a scale of one to four-one being Very uncomfortable and four being Very comfortable. All 31 participants completed both the pre- and post-surveys. The 2000 comfort survey reported Fellows' levels of comfort with financial markets, industrial organization, and pedagogy concepts. Once again, all 31 participants completed both the pre- and post-surveys. The 2001 comfort surveys examined Fellows' comfort with international economics, economic conditions and analysis, and educational research topics. Thirty participants completed the 2001 surveys.

To check the reliability of each of the sub-tests in the comfort surveys, a Cronbach Alpha test was used to check for internal consistency. The reliability analysis for all six administrations of the comfort surveys over three years demonstrates that all instruments were reliable. The Cronbach Alpha values ranged from 0.79 to 0.98, with a mean value of 0.92. Thus, the individual items as a whole had relevant information and a high degree of

internal consistency on the three comfort sub-tests for each administration during all three years.

The means of the pre- and post-tests were compared using a paired-samples t-test (see Tables 7-9). The annual pre-post data gathered from the comfort surveys was used to recommend to professors and the program's director, specific concepts that should be revisited in subsequent courses. Thus, while an analysis of the Fellow's (group) *TUCE* scores would predict trends of understanding of relevant conceptual areas, (for example, macroeconomics) the comfort survey analysis provided immediate feedback on specific concepts within the larger areas. For example, seven items from macroeconomics taught during the first summer had nearly equivalent mean item scores on pre - and post-comfort surveys. In curriculum planning sessions for the second summer, professors committed to reteach these seven concepts and discussed different pedagogical practices to address the students' needs. To determine the benefit of re-teaching the concepts they were added to the post comfort survey administered at the end of the second summer. The results appearing in Table 10 indicate that the re-teaching strategy was beneficial to student learning.

Table 7: Analysis of Comfort Surveys (1999)

Content Area	N	Mean1	Mean2	t	p
Macroeconomics (31 items)	31	66.39	86.65	8.45	< .001
Microeconomics (44 items)	31	114.03	140.06	8.17	< .001
Pedagogy (25 items)	31	73.94	78.68	2.86	< .01

Table 8: Analysis of Comfort Surveys (2000)

Content Area	N	Mean1	Mean2	t	p
Financial Markets (31 items)	31	61.77	92.87	14.99	< .001
Industrial Organization (22 items)	31	54.26	69.55	8.60	< .001
Pedagogy (13 items)	31	34.87	41.23	6.38	< .001

Table 9: Analysis of Comfort Surveys (2001)					
Content Area	N	Mean1	Mean2	t	p
Economic Analysis (11 items)	30	29.71	36.43	9.84	< .001
International Economics (23 items)	30	55.23	77.23	9.54	< .001
Education Research (12 items)	30	23.13	32.93	7.45	< .001

Furthermore, to document the staying power of the Fellows' experience, or more appropriately, the retention of their comfort with economic concepts an additional survey was used. During fall 2001, we administered a retrospective comfort survey, asking Fellows to report on a randomly selected sub-sample of the concepts addressed during the 1999 and 2000 summer sessions. Table 11 clearly demonstrates that one to two years after their initial instruction, the Fellows maintained their comfort with economic concepts.

This result is important because self-reported comfort with economic concepts was found to be a good proxy for assessing economic literacy as measured by the *TUCE*. Fellows' scores on both the macroeconomics and microeconomics comfort survey pretests (1999) were positively and significantly correlated with their corresponding *TUCE* scores. Both correlations were significant at the 0.01 level (Macro: $r = 0.645$, $N = 29$, $p < 0.01$; Micro: $r = 0.584$, $N = 29$, $p < 0.01$). This potentially indicates the ability to have teachers self-assess their economic literacy.

Table 10: Formative Assessment of Macroeconomics				
Content Area (7 concepts)	N	Mean	t	p
Macroeconomics (Summer 1999)	31	14.39	-	-
Macroeconomics (Autumn 1999)	31	15.39	1.39	ns
Macroeconomics (Autumn 2000)	31	19.94	7.51	< .001

Table 11: Retention of Comfort Levels				
Content Area (7 concepts)	N	Mean	t	p
Six-Area Random Selection (1999, 2000)	30	142.16	-	-
Six-Area Random Selection (2001)	30	193.37	13.07	< .001

Effect on Fellows' Practice

Change-in-Practice surveys were used to determine whether participation in the Institute directly affected Fellows' instructional practices regarding a wide variety of economic concepts and pedagogical practices. The surveys were administered during the spring of 2000, 2001, and 2002. They explored the concepts/practices in Macroeconomics, Microeconomics, Financial Markets, Industrial Organization, Economic Analysis, International Economics, and Pedagogy. Each item on the surveys was rated in the context of the Fellow's own classroom on whether there was a) no change in teaching the concept, b) improved practice/teaching of concept, or c) inclusion of the item as a new concept/practice into their classroom repertoires.

This data reveals the value of interdisciplinary (economics and education) preparation in the teachers' professional development and how the Institute influenced the curriculum delivered by Fellows in their respective classrooms. Fellows reported teaching concepts normally not taught in the curriculum and being better teachers of concepts already in the curriculum. While more teachers reported that (as a result of their new learning) they were teaching economic concepts that they had not taught prior to their participation in the Institute, there were fewer teachers indicating that the strategies/practices taught in the pedagogy course were concepts in which they were unfamiliar. However, over 60% of the participants reported during their first two years in the institute that as a result of the pedagogy coursework, they were more skilled in using known instructional strategies/practices (See Tables 12 -14).

Table 12: Change-in-Practice Surveys (Spring 2000)			
Content area	N	"I have not taught this concept in previous years, but I do teach it now."	"I have taught this concept before, but I am teaching it better now."
Macroeconomics (31 items)	31	17.3 %	22.4 %
Microeconomics (44 items)	31	19.6 %	37.9 %
Pedagogy (25 items)	31	8.0 %	60.6 %

Table 13: Change-in-Practice Surveys (Spring 2001)			
Content area	N	"I have not taught this concept in previous years, but I do teach it now."	"I have taught this concept before, but I am teaching it better now."
Financial Markets (31 items)	31	12.3 %	23.8 %
Industrial Org (22 items)	31	8.8 %	45.7 %
Pedagogy (13 items)	31	7.9 %	67.2 %

Table 14: Change-in-Practice Surveys (Spring 2002)			
Content area	N	"I have not taught this concept in previous years, but I do teach it now."	"I have taught this concept before, but I am teaching it better now."
Economic Analysis (11 items)	30	36.5 %	8.1 %
International Econ (23 items)	30	31.3 %	6.1 %
Pedagogy (6 items)	30	6.1 %	6.7 %

For example, many Fellows reported knowing about and using cooperative learning strategies, however, after considering its use specifically within the context of economics education they reported being more comfortable and skilled at using it. Similar responses were associated with teaching tools such as the use of non-linguistic representation, comparing and contrasting, goal setting and other items. During the third summer, the responses indicate much less reported change. This is explained through a shift in emphasis from pedagogy to more of a focus on educational research to inform teachers' actions. As a result of the emphasis shift, the 2001 Change-in-Practice results indicate misalignment between the instrument and the experience of the Fellows. Although there was reported change in all categories, the amount of change associated with pedagogical concepts reflects the value of including pedagogy in the Fellows' course of study.

While this research did not explicitly consider why the known practices and concepts taught were reported as being used in a better manner, the change in Fellows' practices may be connected to the relevancy of the coursework to their work as teachers. Likewise, Fellows reported some change in practice as it pertained to macroeconomics and financial markets. However, it was in these two areas that the least amount of change was recorded. This indicates that the two may currently be a primary focus of existing economics curricula or not an area considered for K-12 curricula. The phenomenon calls for further research.

Institute Assessment

Analysis of the overall quality of Idaho Economic Fellows Institute explored several different facets of the Institute, including quality of faculty, quality of housing and amenities, and overall organization and support. Fellows provided feedback regarding these factors through surveys that included both Likert-type and open-ended responses. Furthermore, the surveys allowed Fellows to reflect on their experience and offer suggestions or considerations for the remainder of the three-year Institute.

Across the three years of data collection, Fellows consistently rated the instructors very well. The average rating of instructors for overall merit

was consistently between 4 and 5 on a five-point scale, with the final summer evaluation averaging 4.59. The courses were likewise evaluated consistently between 4 and 5, with courses in the third summer yielding an average of 4.42.

The overall evaluation of the Institute was consistently high, with the 2001 evaluation of 4.77 on a five-point scale. However, the open response nature of the surveys allowed the evaluators to identify specific areas in need of improvement. For example, during the 1999 summer, several Fellows indicated that the daily schedule of the courses was not optimal for their learning. After careful consideration of balancing the needs of the instructors and the needs of the Fellows, a modified schedule was designed that satisfied both parties' needs. As a result of the formative assessment, each year some subtle, yet important, program changes were implemented.

Although the professional development literature (Fullan, 2001; DuFour & Eaker, 1998) indicates that the creation of learning communities promotes collaborative learning experiences, provides academic and social support, and fosters learning, when educators are enrolled in advanced programs of study, they may or may not develop a learning partnership with others pursuing a similar degree. Within the Institute studied, program directors actively cultivated supportive relationships among the Fellows. During the Institute, the Fellows had opportunities to participate in Ropes courses, attend minor league baseball games, whitewater raft, and travel to the Federal Reserve Bank in San Francisco together. At the conclusion of their last summer together (2001), several Fellows remarked on the strength of the relationships and friendships generated among their peers. So strong were their feelings of camaraderie, many suggested that the Idaho Council for Economic Education facilitate reunion activities in the future. Such relationships rarely occur among participants in traditional forms of professional development or graduate study in education.

DISCUSSION

Our evaluation of the Idaho Economic Fellows Institute clearly supports this format of teacher preparation and/or professional development.

The three-year structured program contains many of the facets of professional development commonly referenced within the literature as critical to supporting high quality teaching (Abdal-Haqq 1996, Corcoran 1995, Daniels 1999, Dorph & Holtz 2000, Fine & Raack 1994, Joyce & Showers 1982, Little 1988, Novick 1996, Putnam & Borko 1997, Sullivan 1999, U.S. Department of Education 1995). These factors include professional development that is:

- based on the view of teaching as intellectual work and recognizes teachers as professionals;
- connected to knowledge of the content that is being taught, and is aligned with local or national content standards;
- ongoing, sustained over time, and allows time and follow-up support for teachers to master new content and strategies to integrate them into their practice;
- inclusive of training, practice, and feedback, providing opportunities to reflect, analyze and work on teachers' practice, and supports the inquiry into and study of teaching and learning;
- practical, and embedded in teacher work;
- collaborative, and provides opportunities for teachers to interact with peers through group inquiry into practice or coaching, and establishes a learning community of which all teachers are members;
- committed to treating teachers as active learners.

Learning experiences that incorporate the above factors create learning environments in which professional educators may work iteratively on improving and refining both their pedagogical repertoire and the understanding of subject matter.

Use of comfort surveys to approximate the economic literacy of the Fellows may allow educators to gauge their relative strengths within the larger discipline of economics. Our research indicates that it was not necessary to use a standardized assessment to test the Fellows' economic literacy. Simply put, teachers do not necessarily need to be tested to learn what they know. All one has to do is to ask teachers in a condition which is conducive to their honest response. Additionally, by engaging teachers in a reflective process it is possible to consider their input as to what constitutes

meaningful and necessary professional development. Thus, by replacing tests used to confirm what a learner knows, with specific content-related, non-threatening questions may, in fact, make professional development programs more humane, more responsive to the learners' needs and save valuable program resources.

Upon review of the data collected to date, we can confidently state that teacher training programs such as the Idaho Economic Fellows Institute can positively affect teacher knowledge, teacher comfort/confidence, teacher classroom practice, and student learning. To maximize the effect of such programs, we highly recommend that program directors engage in detailed, formative assessment conducted by third-party evaluators. In the case of the Idaho Institute, the use of formative feedback was critical to maintaining program quality and meeting the evolving needs of the participants.

Furthermore, it is possible to document the impact of focused, long-term professional development-not only on teacher knowledge, but also on student learning-when longitudinal data is carefully collected. It is important that evaluation of professional development programs move beyond the traditional rating of how teachers "enjoyed" the experience, or how useful they think the information is. These ratings, usually conducted immediately after the conclusion of the professional development experience, can be harmful to future professional development decisions. By carefully collecting a wide range of detailed, longitudinal data educators can be better informed to make decisions benefitting K-12 student learning.

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