

AC 2010-1954: A REVIEW OF THE ASSESSMENT LITERATURE ON COOPERATIVE EDUCATION IN HIGHER EDUCATION

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A Review of the Assessment Literature on Cooperative Education in Higher Education

Introduction

The purpose of this study is to review the assessment literature on cooperative education and related experiential learning experiences of college students to determine the extent to which authentic assessment and other related assessment methods are being used. Heywood¹⁹ stated “that assessment is a multidimensional process of judging the individual in action.” He favors the use of multiple strategies for assessment of academic knowledge and skills. He further quoted Alverno in 1994 as stating that assessment should be aligned with the type of learning:

If learning is to be *integrative/experiential*, assessment must judge *performance*. If learning is to be characterized by *self-awareness*, assessment must include *self-assessment* as well as *expected outcomes* and *developmental criteria* that are public. If learning is to be *active/interactive*, assessment must include *feedback* and elements of *externality* as well as *performance*. If learning is to be *developmental*, assessment must be *cumulative* and *expansive*. Finally, if learning is to be *transferable*, assessment must be *multiple in mode and context*.

This suggests that in any cooperative education experience multiple modal and contextual assessment methods are needed to evaluate learning as well as learning transfer within and between academic knowledge and the skills developed in the work place. Moreover, Bradford et al⁶ reported “a solid research” finding:

To develop competence in an area of inquiry, students must: (a) have a deep foundation of factual knowledge, (b) understand facts and ideas in the context of a conceptual framework, and (c) organize knowledge in ways to facilitate retrieval and application.

They further emphasized that “[a]ll new learning involves transfer based on previous learning,” but that this transfer of learning across knowledge domains is context dependent with learning in multiple contexts more promotive of transfer.

In regard to measuring or assessing learning and learning transfer, Bradford et al⁶ said that the “[m]easures of transfer play an important role in assessing the quality of people’s learning experiences” and therefore, differentiate surface learning from deep learning. Furthermore, Venables & Tan⁴¹ mentioned the need for assessment of a student in a work based learning experience to be within the appropriate context. They said that the “assessment tasks” and the “planned learning outcomes” should be aligned” and that

assessment should promote the development of problem-solving skills, personal development, and social skills within a community or industry focused setting. Tasks have to accurately reflect the workplace environment and encourage students to draw upon their formal learning and use it to interrogate the workplace practices. Assessment that encourages broad capabilities rather than more narrow learning objectives should be employed by educators to ensure that students actually learn in work place.

Experiential learning is an inclusive phrase for many types of work based related learning experiences^{8, 13, 38} including cooperative education. The first cooperative education program in the United States of America dated back to 1906 at the University of Cincinnati^{9, 39}. However, the idea of cooperative education seemed to have appeared in the United Kingdom as early as the

late nineteenth century^{25, 42}. The first experiential learning program emerged in England as a ‘Sandwich Course’ in 1903 at Sunderland Technical College^{25, 42}. The rate of growth of cooperative education/experiential learning for the just over 100 years it has been in existence is not as fast as disciplines like entrepreneurship. Nonetheless, it is steadily growing. Of the nearly 5000 colleges and universities in the United States in 2007⁴³, about 500 of them have cooperative education programs. Worldwide, about 1500 universities in an average of about 50 countries have cooperative education programs^{39, 42}.

From the review of assessment literature of cooperative education and experiential learning related experiences, there seems to be a greater tendency to use perception based assessment instruments in the form of surveys from students and employers^{13, 17, 38}. However, there are instances where other forms of assessment instruments including competency based ones²⁰ were used in cooperative education internships and related experiential learning experiences. For example, Rainsbury et al³⁵ described a collaborative assessment approach that involved students, employers, and academe in the evaluation process for projects in a work based cooperative business course. Their most important finding was in the assessment of the final project grade, by the three different parties, involved for the 19 students in the program. The female students outperformed the male students and their self-assessments tended to be more realistic.

Basic Purpose

Cooperative education programs are academic. They involve a partnership between the student, academia, and industry. Their basic purpose is to provide students with the opportunity to apply the theoretical knowledge learnt in academe to the practices of work place: “integrate theory with practice”^{7, 9, 12, 18, 22, 25, 33}, thereby providing students with a more educational experience. The academia/industry experience of the student may be done in any one of three ways – parallel (part-time), alternating (full-time), and/or summer. The sandwich courses follow the alternating format. In addition to the central purpose of integrating theory with practice, students derived many other advantages^{3, 4, 12, 14, 15, 18, 25, 33, 37} from participating in cooperative education programs, which may be optional in some of the academic institutions where they are offered. Some of these advantages include the development of social skills, engagement in teamwork, improvement of communication skills, enhancement and greater clarity of future career goals, salary advantage, and the development of practical skills.

An Interpretation of Work Based Learning in the Context of Interdisciplinarity

A curriculum inclusive of a cooperative education strategy could be interpreted as an interdisciplinary program^{5, 26, 31} where the work place learning experience is conceptually viewed as one disciplinary domain and the academic discipline is viewed as the other domain. In this context, the issue is one of determining how best to align academic disciplinary learning with the related work place practices for the student to adequately and sufficiently integrate theory with practice, being mindful of the limits of any possible integration. That is, theory learnt may have no current practical application or it may have several practical applications depending on its contextual interpretation. Similarly, the practical application may have no sound theory or it may be fully or partially described by a theory.

Myers and Haynes²⁹ quoted Klein and Newell as saying the following:

achieving synthesis requires proactive attention to process. That means examining how elements to be synthesized are obtained and interrelated. The skills involved are familiar ones: differentiating, comparing, and contrasting different disciplinary and professional perspectives; identifying commonalities; and devising a holistic understanding grounded in the commonalities but still responsive to the differences. The worldview and underlying assumptions of each discipline should be made explicit.

This statement is not only true for the standard interdisciplinary program, but it is also true of a cooperative education program, where the goal is to integrate theoretical knowledge with practical knowledge while developing related skills. For the student to successfully achieve the appropriate level of knowledge transfer between theory and practice and vice versa that permit each domain of knowledge to “actively inform” the other, he or she must become a reflective self-aware and mindful learner who is grounded in both domains of knowledge²⁵.

Recommended Assessment Methods

Today’s emerging workers are likely to change jobs several times throughout their careers⁴⁰: an average of over 10 times. This speaks to the importance of college students becoming disciplinary experts and sufficiently skilled practitioners who function well in a theoretical framework upon graduation. To determine the level of expertise and skills the student developed in a cooperative education internship program through classroom learning and work place training and learning, appropriate assessment instruments capable of measuring the desired level of learning transfer are required, and proper ways of conducting the assessments should be used.

The most appropriate assessment instruments for cooperative education and other experiential learning programs are competency based instruments that not only test and evaluate the students’ theoretical knowledge in the context of the work place learning experience but also measure their performance and evaluate their professional skills displayed on designated tasks in the work place. In other words, the assessment of cooperative education related programs should include both traditional and authentic types of testing techniques, which would constitute a multi-strategy integrated approach to assessment^{19,34}. In performing competency based assessments, one has to be mindful of the need to assess “the knowledge required to perform [the] skills in the work situation”¹⁹. Deduced from the work of Marshall²⁵ and reports of Venables and Tan⁴¹, it seems that both qualitative and quantitative assessment instruments should be included in the multi-strategy integrated assessment model. Some examples of appropriate competency based assessment instruments that could constitute a multi-strategy integrated method can be found in Heywood¹⁹, Marshall²⁵, NCIIA³⁰, and Field-Tested Learning Assessment Guide⁴⁴. Moreover, the assessment model should constitute a process of continual improvement to meet the educational and professional satisfaction of students, faculty/coordinators, and employers¹⁶.

Studies of Cooperative Education Outcomes and Assessment Instruments Used

Sixteen studies assessing cooperative education related programs were found. Of these, 75% (12) used survey instruments^{1, 3, 4, 10, 11, 12, 13, 14, 17, 36, 37, 42} and 12.5% (2) each used interviews/focus groups^{28,38} and mixed data collection methods^{20, 35}. While half of the survey studies assessed student learning in the work place^{3, 10, 12, 13, 17, 36}, the other half focused on program evaluation

and the impact of cooperative education on various dimensions including salary, employability, grade point average, etc. On the other hand, the purposes of the interview and the mixed method studies were to determine student perceptions and skills acquisition during their work based experiences. Interview data from the Thurgate and MacGregor³⁸ study of the first cohort of students who completed a new degree program that integrated work tasks with classroom instruction indicated that some students found “the classroom discussions of the theoretical models motivated them to find new solutions to old problems.” Moreover, the mixed method studies conducted in New Zealand include interviews, surveys, and workshops conducted with students, employers, and university representatives. These studies implemented collaborative assessment models in two different institutions. Whereas both studies included input from students, employers and academics for the students’ work place experience grade, the Hodges study²⁰ also used portfolios as a component of the students’ self-assessment and reflection on their career goals and cooperative education experience.

Overall, 10 (or 62.5%) of the 16 identified studies focused on student learning in cooperative education related programs. Furthermore, of the four cooperative education programs described in the next section, two (LaGuardia Community College²² and Pace University³³) also use surveys to determine the nature of student skills acquisition and performance, as well as student perceptions of their cooperative education experiences.

Examples of Cooperative Education Programs

Examples of cooperative education programs were found on the websites of the University of Cincinnati³⁹, Northeastern University³², LaGuardia Community College of the City University of New York²², and Pace University³³. Each institution defines cooperative education and details the parameters of its program. The University of Cincinnati cooperative education program was initially created to provide undergraduate engineering students a holistic educational experience that includes theory and professional practice. It is now a program offered throughout the university. A new feature of Cincinnati’s cooperative education program as of 2005 is an “educational-assessment model” that uses quarterly online survey administration to cooperating employers and students for the identification of updated skills and new course content for cooperative education program improvement.^{9, 39}

Northeastern University³² was among the first universities in the United States to adopt a cooperative education program after it started at Cincinnati University. Cooperative education is found on this university’s website under the banner of “Experiential Learning”. Students can obtain a cooperative education internship within their own or another college in the university. Moreover, the university has established cooperative education placement agreements in over 80 cities outside of the United States. Areas of study include business and entrepreneurship, health professions, communications, computers/digital technology, engineering/biotechnology, arts and humanities, natural sciences, pre-law, pre-medicine, and urban policy. Students typically start program enrollment in the sophomore year and generally have a total of three cooperative education experiences in a five-year degree program. Also, most majors have a four-year option with fewer cooperative education internships. Support from a cooperative education coordinator helps students identify appropriate jobs, prepare for program participation, and reflect on what

was learned in the cooperative education experience. The reflection process may entail a written assignment, a presentation, or interviews with faculty and advisors.

The LaGuardia Community College cooperative education program is pervasive throughout the institution. It was the “first community college in the nation to include Cooperative Education in its overall mission and to require all full-time day students to complete Co-op internships as part of their academic program.”²² While the program support structure at Pace University³³ is quite similar to the institutions with mandatory cooperative education programs, Pace’s program is optional. Students must attend seminars and workshops before, during, and after their cooperative education internships to help them prepare, participate, and reflect on their experiences. Students at this institution can enroll in parallel (or part-time) cooperative education experiences as well as the traditional alternating or summer (full-time) schedule. In addition, although the cooperative education internships are structured to be in alignment with students’ majors, students do not get academic credit but they are generally paid by the employers.

The information on each institution’s website provides illustrations of the various implementations of cooperative education programs in United States colleges/universities. The one unifying aspect documented on each site is the program purpose of integrating experiential and classroom learning.

Adequacy of Identified Assessment Instruments Relative to the Recommended Ones

The literature review revealed that the current state of cooperative education assessment instruments used are not sufficient to determine the extent of learning and learning transfer between academia and the workplace/industry and vice versa. There seems to be a general lacking of use of competency based assessments and assessment mechanisms that reinforce each other’s findings. Of the 16 studies that include assessment of cooperative education related programs, only 25% used multiple assessment strategies and 12.5% of these strategies (mixed data collection methods) include both qualitative and quantitative assessment strategies that include competency based methods; the evaluation of the student performance on work place projects involved a collaborative team of students, academic, and employers. However, not evident in these 12.5% of the studies is the extent to which students’ theoretical knowledge was evaluated in the context of their work place tasks.

Conclusion

The research of the literature showed very little evidence of assessment of student learning and learning transfer between theory and practice in cooperative education and related work based learning experiences. While most of the programs examined mentioned that one of the aims of cooperative education is to “integrate theory and practice,” we are unable to find explicit evidence of assessment of this core program feature. This may explain the hesitancy of some academic faculty to buy-in to cooperative education because they view it as mainly vocational²¹,

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