DEVELOPMENT OF A LOGIC MODEL FOR USE
IN EVALUATION OF LEARNING SUPPORT PROGRAMS

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Abstract

Higher education faces many barriers in providing quality education to students, with educating underprepared students as one of the most challenging (Parker, 2007). Although developmental education found a permanent home in community colleges, the greater concern is not the location of remediation education, but rather the impact on student success (Parker, Bustillos & Behringer, 2010). A state-wide evaluation of thirteen Tennessee community colleges was conducted to understand 1) how learning support is delivered, 2) the perceptions of key stakeholders, and 3) the overall effectiveness of learning support in regard to student success indicators such as grades and progression. Based on results of the evaluation, a logic model was developed to enable institutions to internally assess developmental education programs and institute changes to increase student learning and success.

Keywords*: developmental education, learning support, student success, evaluation, logic models

Introduction

Institutions of higher education nationwide are experiencing increasing pressure to produce more graduates while also reducing the length of time to completion (Belfield, Crosta & Jenkins, 2014). Rather than diminishing, the need for quality higher education has grown over the years due to the strong link between education and American prosperity (AACC, 2012). Primarily the more educated people are, the likelier they are to be employed, able to make a living and support their family, pay taxes, and contribute to their community (AACU, 2012). Community colleges have historically provided an increased

chance for prosperity through their open access mission, but access is no longer the largest barrier in obtaining an education. Complete College America (CCA) strongly advocated that access without success is an empty promise and a missed opportunity with significant economic consequences.

Compounding the concern, not all students are ready for college academics, especially at the community college level. In fact, "60 percent of first year college students discover that, despite being fully eligible to attend college, they are not academically ready for postsecondary studies" (National Center for Public Policy and Higher Education, 2010, p. 1). In Tennessee, that percentage is higher; 64.6% of first-time students in Fall 2017 needed some level of developmental education (Tennessee Higher Education Commission, 2018).

With such alarmingly high statistics, developmental education has risen to the forefront of higher education conversations as an area for further scrutiny. "Recent innovations in community colleges and four-year institutions across the country suggest that the traditional model of developmental education may be changing" (Boatman, 2012, p. 5) as "it is quite difficult to increase the college completion rate substantially when many students who fail to complete are far short of meeting program requirements" (Belfield, Crosta & Jenkins, 2014, p. 342). As a way to bridge the preparedness gap and increase completion rates, the State of Tennessee moved all developmental education under the purview of its community colleges, and the institutions within the Tennessee Board of Regents (TBR) system adopted the corequisite delivery model for developmental education created to increase student success over the traditional sequential implementation model.

Since developmental education is one of the components for state financed performance-based funding, Tennessee community colleges must be able to assess performance and enact revisions quickly to maintain adequate financial support. Although a formalized area of study, there are not formalized standards in the developmental education field. While all Tennessee institutions are encouraged to use the corequisite model, each institution had academic freedom to customize the corequisite delivery model they believed best met the needs of their students. Thus, questions remain regarding: 1) how the model looks at each institution, 2) what is the fidelity of implementation by

subject, 3) what are the perceptions of learning support, and 4) what is the overall effectiveness of the model on student success.

A state-wide evaluation of learning support delivery methods in the thirteen community colleges across the state of Tennessee was conducted. The mixed methods study sought to better understand learning support corequisite implementation. Triangulated findings were used to create a logic model other institutions can utilize to systematically assess their own developmental education programs.

Developmental Education

Developmental education has been a part of the education field for almost 400 years. Typically, developmental education refers to courses taken on a college campus that are below college-level; most commonly in the subjects of English, Math, and Reading. Known by many other names such as remedial education, basic skills education, transitional, or learning support; all of these terms are used interchangeably in both the literature and practice. The Learning Support Centers in Higher Education (LSCHE) utilize a common definition developed from National Organization for Student Success (NOSS; previously NADE); "developmental education is programs and services that address academic preparedness, diagnostic assessment and placement, development of general and discipline-specific learning strategies, and affective barriers to learning" (LSCHE, n.d., p. 1). It is a stair-stepped progression of courses designed to bring students up to college ready based on their current level, promoting growth of learners at all levels of the learning continuum (Arendale et al., 2009).

While the words remedial and developmental are used interchangeably, they tend to have different connotations. Parker, Bustillos, and Behringer (2010) explain that "remedial" suggested students haven't acquired the necessary skills for success at the postsecondary levels requiring that their skill deficiencies need treatment while "developmental implies an unfinished process of learning and growth can be promoted via assistance" (p. 4). Based on this definition, higher education institutions universally changed the terminology to developmental education to soften the implied deficits of students. This negative association is one reason why Tennessee changed the course names to the classification of "learning support" implying a supportive service rather than correcting student skill gaps. This supportive approach to learning viewed the current

education process as transformational, "taking the student from their current level and developing abilities to become a more capable, self-confident, and resourceful learner" (Center for Student Success, 2007, p. 9).

Regardless of the name assigned, developmental education is an important component of higher education with mixed results. It is estimated that approximately 2 million students would drop out of college without access to development education (Wolfle, 2012; Higbee, Arendale, & Lundell, 2005). By providing students an opportunity to address their academic deficiencies, developmental education could potentially promote greater success in college (Clotfetler et al., 2015). However, recent research indicates that being assigned to developmental education significantly decreases student chances of successfully passing college-level courses as well as overall success in college (Clotfelter, Ladd, Muschkin, & Vigdor, 2015). Remediation is intended to play an important role for both students and the institution they attend, but there are growing debates about its effectiveness, how it is being delivered, and who should be providing the remediation (Long & Boatman, 2013).

Course Delivery Models

Rethinking the way the instruction is delivered, an increasing number of redesign efforts now incorporate the innovative use of learning technology into the classroom (Twigg, 2011). These newer models attempt to "better target students' academic needs through improved instructional practice, often through the use of learning technology such as self-directed learning labs, online-learning models, and the use of high-tech classrooms" (Boatman, 2012, p. 7).

The National Center for Academic Transformation (NCAT) provides leadership in using information technology to redesign learning outcomes for students (NCAT, n.d.). During their work, NCAT developed six models for course redesign: supplemental, replacement, emporium, fully online, buffet, and linked workshop. With the NCAT guidelines in mind and the need to make a drastic change to the way developmental education is delivered, the linked workshop model makes the most sense for institutions interested in increasing student success. The corequisite model is one example of a linked workshop.

Corequisite developmental education enrolls students in remedial and college-level courses in the same subject at the same time with the same instructor, and students receive targeted support to help boost their understanding and learning of the college-level course material (CCA, 2013; CCCSE, 2016). Pairing the courses together creates a cohort of developmental students allowing them to work with stronger students in higher-level class and accelerates progression through developmental education (CCCSE, 2016). "Early results are showing that these initiatives are yielding better outcomes for students in less time and with significant savings for students and institutions" (CCA, 2012.p. 2).

Although better outcomes in moving through developmental education is important, "the bigger issue is its overall effectiveness in increasing college success" (Parker, 2010, p. 21). "Despite its profound importance and significant costs, there is very little rigorous research analyzing its effectiveness" (Levin & Calcagno, 2008, p. 181). Bettinger and Long (2009a) explain that most of the studies conducted have been descriptive and provide simple comparisons between remediated and non-remediated students.

Inconclusive Developmental Education Results

Research on college remediation, specifically the scope and effectiveness, is growing, but does not provide clear-cut evidence of the benefits of remediation for students (Boatman, 2012). "Broadly speaking, colleges still know little about the most effective ways to provide remedial and developmental courses to improve students' chances for postsecondary success" (Boatman, 2012, p. 4). While some studies demonstrate slightly positive effects from being placed into a remedial course on a student's educational progress and degree attainment, most studies find neutral or no effect and a few even slightly negative effects.

Calcagno and Long (2008) found mixed results in Florida: students scoring just below the cutoff were slightly more likely to persist into the second year than those scoring just above the cutoff, but there was no effect of remediation on college-level math courses, completing a certificate or associates degree, or transferring to a 4-year college. Martorell and McFarlin (2011) found that remediation in Texas had no effect on student outcomes such as the probability of passing a college-level math course, transferring to a 4-year college, or completing a degree. Scott-Clayton and Rodriguez (2012) found no evidence that remedial courses successfully prepare students for success in college-level courses, with

some of the effects being negative. Clotfelter, Ladd, Muschkin, and Vigdor (2015) found that in North Carolina the lowest achieving students are more adversely affected by remediation than higher achieving students but no evidence that assignment to remediation discouraged students from continuing their college career in the short term. Roksa and colleagues (2009) noticed no difference in the pass rate of gatekeeper English or Math classes in Virginia; further, students who were recommended for remedial courses but did not take them did equally as well in other educational outcomes as students who did take the remedial courses.

Since the prior research is full of inconclusive findings, this suggests that the effect of remediation on student outcomes is not yet fully understood (Long & Boatman, 2013). Some common concerns about previous studies include factors such as most studies were strictly descriptive and only compared remedial students with their peers, focused on students just on the margin of needing remedial courses, or took place at only one institution (Long & Boatman, 2013, Rutschow & Schneider, 2011; Schwartz & Jenkins, 2007). It cannot be ruled out that there may be increased positive outcomes if the methods of delivering developmental education were improved (Clotfelter, Ladd, Muschkin, & Vigdor, 2015).

Need for Program Evaluation

Most students must complete remedial education to have any chance of earning a credential. "Despite the number of students who take developmental courses at community colleges, there is surprisingly little definitive research evidence on what makes for effective developmental education practice" (Schwartz & Jenkins, 2007, p. 2). "The unfortunate truth is that many community colleges have trouble monitoring their own performance" (AACC, 2012, p. 19). To make meaningful and lasting change, sharing results and learning from the effective practices of high-performing institutions can begin to fill gaps in knowledge about what works in developmental education (Collins, 2009). Additionally, Tennessee, with many statewide policies standardizing developmental education, is primed to strategically evaluate the implementation of program delivery and its effects on student persistence. With the new delivery types being piloted across the nation, it becomes important to not only look at student success rates but also how programs are being delivered in order to make accurate comparisons.

Study Purpose and Methodology

The purpose of the study was to understand how learning support courses are implemented in community colleges across Tennessee, perceptions regarding level of preparation gained for college-level courses provided by learning support courses, and the immediate student success as defined by course grade in the first college-level course after learning support participation. Currently, little is known about the effectiveness of various types of delivery methods for learning support or even what the delivery model looks like on each campus. Even as recently as April 2016 substantial questions remained, especially concerning recently mandated implementation of corequisite remediation in Tennessee (Belfield, Jenkins & Lahr, 2016). A mixed methods approach was utilized to collect quantitative and qualitative data from learning support coordinators and faculty members while student success was evaluated through system-wide archival student data from the Fall 2015 cohort. Collection of data from multiple sources and methods enhanced understanding via triangulation. Methodological triangulation involves using more than one kind of method to study a phenomenon and can be beneficial in providing confirmation of findings and enhanced understanding of studied phenomena (Bekhet, 2012). Further, triangulation creates trustworthy conclusions and enhances consistent themes when data are gathered from multiple sources and samples, ultimately increasing the reliability and validity of the study (Hatch, 2002).

Surveys and archival student data were used to conduct the learning support corequisite model evaluation. After searching for existing instruments that addressed all facets of the research questions and finding none, the principal investigator created specific instruments to survey target populations. Two surveys were developed to obtain a 360-degree view of what learning support programs look like at each campus, one aimed at learning support program coordinators and the other addressed to faculty teaching learning support courses. The learning support coordinator survey included questions on delivery model of learning support courses, how students' progress through competencies, benefits and challenges with current delivery model, how decisions are made regarding how the delivery model may be modified for students, communication with students about learning support requirements, and professional development opportunities to stay current in the field. The learning support faculty survey included questions focused on

program characteristics such as delivery details, academic and student support structures for learning support students, and perceptions of program effectiveness.

Open-ended questions embedded in the survey were used to facilitate the recognition of limitations as well as success in meeting student learning outcomes at each institution. During the development phase of the instrument, each survey was sent to three learning support content experts to ensure that the survey would adequately define and describe how learning support can be delivered. After the peer review process was completed, revisions were made as suggested. The updated survey was sent to a group of survey research and content experts to ensure that the questions asked were clearly understood and would elicit response intended. This group included three faculty members, one college administrator, and one institutional researcher. Both researcher created instruments appear to have face and content validity.

Since, the number of coordinators vary by institution, as well as associated responsibilities; the minimum number of learning support coordinators identified to survey was one per institution. When appropriate, more than one coordinator per campus was surveyed to understand all components of the delivery method of a particular learning support program. The coordinator survey included questions on the delivery model of learning support courses, how students' progress through competencies, benefits and challenges with the current delivery model, how decisions are made regarding how the delivery model may be modified for students, communication with students about learning support requirements, and professional development opportunities to stay current in the field. Although effort to obtain input from one coordinator from each institution was made, eleven coordinators completed the survey from five institutions, representing a 40.7% response rate.

All faculty members teaching a learning support course during the 2015-2016 and 2016-2017 academic years at any of the thirteen TBR community colleges had an opportunity to complete the survey for this study. Additionally, the three learning support subjects were all eligible, including English, Math, Reading as well as the associated college-level course component. Questions on the learning support faculty focused on program characteristics such as delivery details, academic and student support structures for learning support students, and perceptions of program effectiveness. After removing

missing cases, 152 learning support faculty across twelve of thirteen community college institutions completed the survey, representing a 17.5% response rate. Where appropriate, data from both surveys were combined into one data set. Each question was then analyzed by response frequencies and percentages. Responses to the open-ended survey questions were downloaded into a Word document, reviewed, and hand coded to identify relevant themes.

In addition to learning support coordinator and faculty surveys, archival student data was utilized for progression and course taking habits. The archival student data was also used to determine student success in learning support courses and subsequent college-level courses. The archival student data was provided by TBR and included information for all students initially enrolled in one of the thirteen community colleges across the state of Tennessee during the Fall 2015 semester. This group of students (n = 87,780) was referred to as the Fall 2015 cohort and included data from Fall 2015, Spring 2016, Summer 2016 and Fall 2016 semesters. This design allowed the principal investigator to follow a specific group of students from one set point in time to determine effectiveness of learning support program. The data file included a masked ID randomly generated at TBR to ensure that the principle investigator would not be able to identify individual students. The data file included information such as the number of learning support subjects required, learning support Math flag, learning support Reading flag, learning support Writing flag, each learning support course(s) and grade(s) by semester, each corequisite course(s) and grade(s) (by semester), all subsequent college-level course(s) and grade(s) (by semester), fall to spring progression, fall to fall progression, credit accumulation (by semester- attempted and earned credits), GPA (overall by semester), earned credential (if applicable), ACT and SAT scores (best composite and by subject), COMPASS exam scores, date of birth, gender, race/ethnicity, Pell status, enrollment status, and student type. For the purpose of this evaluation flag is used in the student information system to indicate if a student was required to take learning support courses.

The archival student data provided from TBR was initially checked for missing data and outliers, and then normality, linearity, and multicollinearity. Overall, there was much

less than 5% missing data; in some of the demographic categories, data was missing for just 30 students out of 87780.

Logic Model Development

Evaluation is the "social practice of making judgments of quality about an intervention or a program implemented in particular contexts, based on data from social science methods and criteria of quality stipulated by someone or ones" (Greene, 2013, p. 72). Thus, evaluation practice is more than just predicting theoretical situations but "incorporates context, judgment, values, and interests, commonly representing a diversity of program stakeholders" (Greene, 2013, p.72). In the evaluation field, program theory and logic models are used interchangeably (W.K. Kellogg Foundation, 2004). The W.K. Kellogg Foundation utilizes logic models in providing funding to nonprofit organizations and states that "logic models can alternatively be referred to as theory because they describe how a program works and to what end" (W.K. Kellogg Foundation, 2004, p. 2).

A logic model is a visual representation of a program's theory of change (Fretchling, 2015); they provide a "way of clarifying how a series of activities is expected to lead to a set of desired outcomes, but do not prescribe a specific strategy for assessing whether the theory is correct" (p. 303). Put another way, the logic model is "a systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan, and the changes or results you hope to achieve" (W.K. Kellogg Foundation, 2004, p. 1). When used as part of an evaluation study, a logic model can provide the foundation for looking at implementation, as well as outcomes (Fretchling, 2015). Logic models provide many benefits for an evaluation such as: make explicit the theory underlying a project and why certain actions should be expected to lead to specific outcomes, identify gaps in a project's structure or logic, provide a tool for management and monitoring, and identify questions that should be addressed (Fretchling, 2015, p. 304).

A basic logic model contains a minimum of six components: inputs, activities, outputs, short term and intermediate outcomes, and long-term impacts within a specific context (Fretchling, 2015). Inputs are the resources used to conduct a program and can include staff, budget, organization, and community contributions. Activities are how the program utilizes resources. "Activities are the processes, tools, events, technology, and

actions that are an intentional part of the program implementation" (W.K. Kellogg Foundation, 2004, p. 2). The resulting product of activities are considered the program outputs. Outcomes and impacts are the "specific changes in program participants' behavior, knowledge, skills, status and level of functioning" (W.K. Kellogg Foundation, 2004, p. 2). Many logic models include short-term, intermediate, and long-term/impact outcomes. Typically, short-term outcomes are attainable within one to three years and impacts within seven to ten years.

Logic models have a range of uses and are beneficial for developing program design, identifying and developing program performance measures, supporting strategic planning, and assisting in communicating priorities of the program (Smith, 2010). Additionally, logic models used for program evaluation can improve three main areas: program goals and accomplishment of objectives, identification of successful activities and those that need improvement, and determination if allocated resources are yielding the greatest benefit (Smith, 2010).

The overall purpose of a logic model is to provide a visual map linking need, resources, activities, and outcomes. "Mapping a proposed program helps to visualize and understand how resource investments can contribute to achieving intended program goals and lead to program improvements" (W.K. Kellogg Foundation, 2004, p. 3). Data collected through participant surveys and historical student data were used to develop a logic model to determine if the premise behind the corequisite learning support delivery model performs as anticipated.

Development of Logic Model Using Study Results

As an evaluator, it is vital to bring the recommendations back to stakeholders; and a logic model format assists in maintaining focus on process of program improvement from starting point to end. Themes emerged from responses to open-ended learning questions on the support coordinators and faculty surveys. Survey questions contributing specific areas identified as opportunities for programmatic change included:

- What other resources should be available for learning support students?
- What challenges have you experienced in implementing learning support courses?

- What recommendations do you have to improve delivery of learning support courses on your campus?
- Is there anything else you would like to share with me regarding learning support on your campus?
- What are the strengths of your learning support program?
- What challenges do you see with how your learning support program is implemented?
- How would you recommend addressing the challenges, if any?
- What is your opinion of how students respond to learning support courses?
- How do you think other faculty feel about the learning support courses?

The resulting themes from the qualitative analysis were placement, communication, curriculum, professional development, and academic student supports.

Placement of students is the first area identified for further investigation. Two main concerns emerged, the overplacement of students and lack of a benchmark for student scoring on low end of ACT spectrum. Based on the TBR guidelines of ACT and COMPASS scores, some students may be placed unnecessarily. An analysis of ACT and COMPASS scores revealed that 2% of Math, 12.2% of Writing, and 27.5% of Reading Learning Support students were above the required threshold. Ngo and Melguizo (2016) state that when placement is not accurate, this negatively affects likelihood that students will be successful and meet long term academic goals. The trend nationally has shown that students are not placing above readiness benchmarks, in fact, only 25% of students met the ACT readiness benchmark in all four areas in 2012 (Bautsch, 2013). If students are scoring higher than the benchmark, an assumption could be that the students should not be in the course. Further, overplacement could cause students not to take the learning support course seriously, a concern notated by multiple faculty members in open-ended response. Additional data showed that some students earned a passing grade in the college-level course component yet failed the learning support course, which validated the expressed faculty concern. Belfield and Crosta (2012) recommended using high school GPA to place students as this could cut over placement error in half.

Another consideration with the placement of students is the development of a lower threshold. More than 1/3 of all learning support students scored a 15 or lower on the ACT composite. One faculty member shared, "We do not have a threshold. For instance, a student with an ACT English score of 10 can enroll in my English Composition I course. Not surprisingly, this student struggles to write college-level essays and gives up or fails." Faculty members and coordinators further commented that students with these low scores are overwhelmed and not able to grasp necessary concepts to progress. Policy makers should determine the specific point alternative methods that will be provided to bring students up to necessary level to fully understand and complete learning support competencies. The one size fits all strategy was concerning to faculty members in general, but one felt that it was "especially damaging to for low socio-economic status, first generation, and part-time students." Low-income and first generation students strive to overcome multiple challenges to be successful in college. Data from the fall 2015 cohort indicates that the majority of learning support students are low-income and have ACT scores below 20. These factors combined may warrant investigation into placement methods and alternative delivery models for students below a certain benchmark.

Communication was another area to review, in all aspects, including communication with students, between faculty members, and within leadership and program coordinators, and from the system office. More than one faculty member commented that some students did not understand why they had to take two classes together. Another part of the problem could be that students do not understand the placement process or the concept of developmental education. Bautsch (2013) stated that students are "unaware of what the college assessment and placement process entails; students may not know [that] the placement tests determine the classes they're allowed to take, so they do not take the test seriously" (p. 2). If students are not aware of the purpose of placement tests, then they may also not understand the purpose of learning support courses. Widespread dissemination to incoming students of the scores that are required to take college-level courses and the steps to take if they fall below the mark is essential.

Communication between the learning support faculty member and the college-level course faculty member was another area identified as a challenge. Increased communication and collaboration could help ensure that students sense the connection

between the two courses and understand the importance of attending both components. However, this responsibility should not fall solely on the shoulders of faculty. Administrators should provide time and resources to align the connection between the two courses. New faculty members should be onboarded immediately to ensure consistency of delivery.

Coordinators also indicated that there was a committee providing oversight of the learning support delivery and the committee met as needed. One way to facilitate communication would be to facilitate the utility of the committee by allowing larger membership to include representation from all learning support subjects and have a standing meeting to discuss challenges or implement quick professional development "tips of the month." Meeting on a regular basis creates a chain of communication that encourages building relationships and proactive planning rather than waiting until a problem needs to be addressed. Centralized governance can provide common thread for the learning support program rallying support when necessary. Strong coordination is crucial; within effective developmental programs, administrators, deans, faculty, and staff share awareness of program goals and strategies and reinforce the system through collective practice (Neuburger, Goosen, & Barry, 2013).

The last area of communication is the component coming down from the system level. Several faulty commented that the system is responsible for policy mandates with very little time for planning or input from the institution. The way change was described, it almost seemed like a double-edged sword. For example, some institutions had been running pilot models, but then TBR required implementation of the corequisite model without reviewing pilot data. Although mandating a particular model, some latitude was given for customization. Allowing for individualized models poses challenges for the evaluation and comparison of programs across the state. Clear definition of model components or a standardized implementation plan, would allow for easier communication and understanding by all parties responsible for learning support delivery.

Several items falling under the general topic of curriculum were identified during the course of the current study. Tightening up the connection between the paired courses is just a small part of curriculum review. Several faculty members indicated that students did not understand the reason for two courses, and there was not a clear link between the two.

Furthermore, the learning support curriculum should be connected to the program goals and outcomes. In at least one instance, goals of the course were not clear to a faculty member. Another respondent shared, "Specific guidelines for course materials were not provided and each instructor was left to design the course. Therefore, much confusion ensued, as instructors attempted to model courses that fit the needs of their concurrent class."

Although there is a committee that reviews curriculum and implements best practices, some felt faculty input should also be considered. Collaboration was discussed as taking place in a one to one instructor situation, where the faculty members initiated on their own, but not at a program level. Faculty input would go a long way for building buy-in and creating clear programmatic structure. All of these factors should be considered when redesigning an individual course, much less when redesigning at the program level. Although each subject area has been able to develop their own version of the corequisite model, it may be time to consider putting all learning support under one program. Non-learning support students in this study were much more successful in all disciplines than learning support students, even after the learning support intervention. National pass rates hover around 75% (Tennessee Higher Education Commission, 2010) and non-learning support study students performed in that range, from 68%-82%. Learning support students from the Tennessee Community Colleges, on the other hand, did not reach that standard and even had pass rates as low as 37%. Housed under one area, not only could learning support resources be consolidated, but also the organization of delivery could be streamlined. Faculty members from all subjects could develop goals and outcomes of learning support courses, collaborate to link course context between both course components, work through design issues, and facilitate learning within the group.

Kolodner (2016) states that while remediation reform is scrutinized on all levels, a key factor frequently overlooked is the teaching itself. In most cases, instructors hired to teach pre-college English and Math have little experience or training. Of the faculty respondents, 66.1% reported holding a Master's Degree and 21.5% a Doctoral Degree, demonstrating the learning support faculty across the state are more educated and experienced than the national norm. This study asked learning support coordinators about professional development opportunities, and the majority who responded indicated that no

additional professional development was necessary. However, the four coordinators responding have been teaching for over 20 years. Open-ended responses by faculty indicated that more training, especially for new faculty, was important and missing in some cases.

A commonly accepted tenet of Tinto's work is that retention is strongly correlated to a student's interaction with faculty (Hutto, 2017). Forty-seven percent of the faculty responding to this study were adjunct faculty. Adjunct faculty not assimilated into an institution can adversely affect student learning through reduced instructional quality, lack of curricular cohesion, and weak advising (Jacoby, 2006). Neuburger, Goosen, and Barry (2013) outlined several components to effective developmental education programs: a) hire appropriately credentialed, trained, educated, and experienced faculty and professional staff; b) provide continued support and sufficient funding for research and professional development; c) investigate and design practices based on research and theory from a broad perspective; and d) push for advanced credentialing. Adjunct faculty are usually left out of professional development opportunities. One interesting suggestion included developing a specially trained cohort of faculty that would team teach a set of student sections. This approach could help also bring adjunct faculty into the fold.

The first four main implications of the study have been focused on institutional process, policy, and procedure. The last implication concerns direct student services. During the study, many types of academic and student support services were identified as being available to learning support students in an attempt to enhance their success. In one study conducted by Carr (2012) connecting students to effective support services greatly impacted student success. Most faculty indicated that the variety of academic services provided was more than sufficient. However, the under-utilization of, inability to use, or lack of access to available services were identified as another area of concern. Since this study did not focus on student services, more research is necessary. Further evaluation of student needs, services offered, and when services are most utilized would help identify if provided services are enhancing the instruction for targeted students.

How Institutions Can Utilize the Logic Model

The intent of developing and sharing a logic model based on triangulated study results is to empower institutions to conduct their own internal evaluation, without having

to recreate a new instrument. The logic model is contained in Table 1 and contains inputs, outputs, outcomes, performance measures, and evaluation questions based on results from this study. A space for individualized assumptions and external factors has also been included as each institution's specific environment should be carefully considered as it varies depending on factors such as location, community support, student characteristics, and political influence. The suggested evaluation questions provide a framework to further guide the process while the performance measures outline specific methods to consider for quantification of program inputs, outputs, and outcomes. While envisioned to assess the learning support program holistically, it is not required to measure all aspects of the program at one time. The logic model format enables documentation of a baseline status of the program beneficial for future comparisons. Inputs are grouped together to enable institutions to look at factors individually and will also yield actionable results in areas such as aligning pedagogy, enhancing course delivery, improving student learning outcome (SLO) assessment, and understanding use of student support services.

Pairing the professional development and staff resources inputs together is an important step in facilitating cohesiveness in learning support for pedagogical strategies and can lead to a unified curriculum. All faculty, including adjuncts and staff instructors, should be familiar with the method of course content delivery for their subject and also other learning support subjects on campus. Investigating the number of trainings provided on best practices and technology usage as well as attendance statistics, can illustrate gaps in professional development. Regular review of the curriculum with instructional faculty can lead to better alignment of curriculum between the learning support course and college level course. Stronger alignment of the paired courses could also foster clearly articulated outcomes and expectations for student demonstration of competencies leading to increased ability to measure SLOs. Lastly, the academic support services available to students can provide answers to another piece of the learning support program. While many academic supports are available, little has been done to understand when and how students use the service.

Conclusions

Educating underprepared students will continue to strain resources in higher education, especially in the face of mounting pressure to graduate more students in shorter

amounts of time. The corequisite model seems to have gained ground in Tennessee as one method of combating this issue. However, systematic and continuous evaluation is necessary to continue to understand learning support delivery and make programmatic changes. Utilizing the logic model, which was based on results from a recent statewide study, can assist institutions in conducting their own internal evaluation. In addition to providing baseline metrics, the evaluation using a logic model can yield actionable results in areas such as aligning pedagogy, enhancing course delivery, improving student learning outcome (SLO) assessment, and understanding use of student support services.
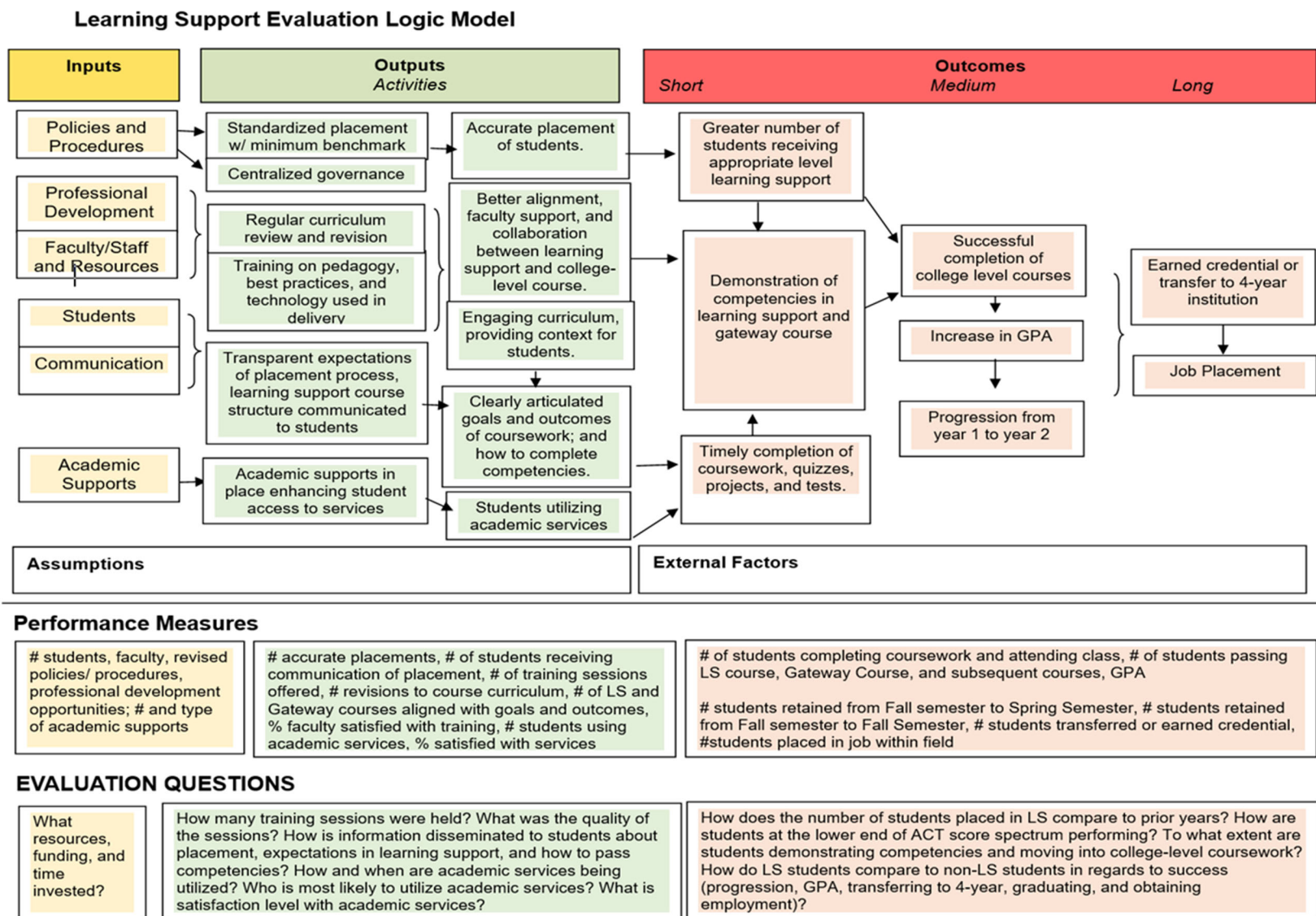
Table 1: Learning Support Evaluation Logic Model

Learning Support Evaluation Logic Model

Inputs	Outputs Activities		Outcomes Short	Medium	Long
Policies and Procedures	Standardized placement w/ minimum benchmark	Accurate placement of students.	Greater number of students receiving appropriate level learning support	Successful completion of college level courses	Earned credential or transfer to 4-year institution
	Centralized governance				
Professional Development	Regular curriculum review and revision	Better alignment, faculty support, and collaboration between learning support and college-level course.	Demonstration of competencies in learning support and gateway course	Increase in GPA	Job Placement
Faculty/Staff and Resources	Training on pedagogy, best practices, and technology used in delivery	Engaging curriculum, providing context for students.			
Students	Transparent expectations of placement process, learning support course structure communicated to students	Clearly articulated goals and outcomes of coursework; and how to complete competencies.		Progression from year 1 to year 2	
Communication			Timely completion of coursework, quizzes, projects, and tests.		
Academic Supports	Academic supports in place enhancing student access to services	Students utilizing academic services			

Assumptions	External Factors

Performance Measures

# students, faculty, revised policies/ procedures, professional development opportunities; # and type of academic supports	# accurate placements, # of students receiving communication of placement, # of training sessions offered, # revisions to course curriculum, # of LS and Gateway courses aligned with goals and outcomes, % faculty satisfied with training, # students using academic services, % satisfied with services	# of students completing coursework and attending class, # of students passing LS course, Gateway Course, and subsequent courses, GPA # students retained from Fall semester to Spring Semester, # students retained from Fall semester to Fall Semester, # students transferred or earned credential, #students placed in job within field

EVALUATION QUESTIONS

What resources, funding, and time invested?	How many training sessions were held? What was the quality of the sessions? How is information disseminated to students about placement, expectations in learning support, and how to pass competencies? How and when are academic services being utilized? Who is most likely to utilize academic services? What is satisfaction level with academic services?	How does the number of students placed in LS compare to prior years? How are students at the lower end of ACT score spectrum performing? To what extent are students demonstrating competencies and moving into college-level coursework? How do LS students compare to non-LS students in regards to success (progression, GPA, transferring to 4-year, graduating, and obtaining employment)?

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