Chapter 3: Methodology

3.a. Method of Inquiry - An Overview

The Professional Education Unit (PEU) investigates the quality and effectiveness of CMU’s educator preparation programs for initial certification at multiple time points during teacher candidates’ enrollment at CMU using various measures (see Figure-3.a.). These measures include (a) quantitative evidence examining performance outcomes from direct and indirect metrics; (b) qualitative tools of inquiry investigating subjective responses from surveys, and (c) longitudinal evaluation of sub-populations of candidates assessed at different levels of preparation. Sources for the metrics are from: (a) in-house measures developed and established by CMU over time, and (b) data/measures provided by the State of Michigan Department of Education (MDE).

The measures used to assess CMU teacher preparation programs can be classified as input, process, and output measures. These measures range from quality of admitted candidates to the effectiveness of program completers. The measures were estimated using the entire candidate population without any sampling or focus group categorization. Output measures gauge the performance of candidates nearing program completion and after program completion. Output measures include four direct measures (i.e. Pre-Student Teaching Final Evaluations, Student Teaching Final Evaluations, MDE University Supervisor Survey, and MTTC pass rates) and four indirect measures (i.e. MDE Teacher Exit Survey, MDE Year-Out-Survey, CMU Alumni Survey, and CMU Principal Survey). Data from the output measures were derived from at least three time periods, with the exception of the MDE Year-Out-Survey which was established a year ago. Output measures included the entire population of the teacher candidates/completers specified over the respective time periods. Similarly, data from input and process measures were also collected for the entire pool of candidates in teacher preparation programs. Every effort has been made to include the trend data from multiple years. The evidence obtained from these measures were disaggregated to individual licensure areas and other subcategories to make meaningful inferences and improvement plans.

In order to perform longitudinal evaluation, a subpopulation of 80 candidates who graduated in fall 2012 were selected for detailed analyses. A purposeful sampling method was employed to sample completers for whom the Teacher Effectiveness Labels from the State are available. The sample of candidates were evaluated at various time points and associated performance outcomes were collected and analyzed to examine the quality of the measures used to evaluate the program. Further, longitudinal data were analyzed to explicate various program characteristics and preparation process details.

CMU maintains seamless integration of various data repositories across the campus. Several in-house data sources were mined from these repositories using ad-hoc queries. The schematic shown in Figure-3.b. provides a snap-shot of available internal and external data resources available to CMU that were accessed to derive input, process, and output measures.
Figure 3.a. General Structure of CMU’s Teacher Preparation Curriculum and Common Assessments
Figure-3.b. Schematic of the Internal and External Data Resources for CMU

3.b. Measured Evidence and Evaluative Attributes

CMU’s educator preparation program have been building an evidence-based system centered on continuous improvement and published body of literature and proven methodologies in the field of educator preparation as well as other clinically-oriented programs, such as health-care provider preparation (Feuer, 2013; Gansle, Noell and Burns, 2012; Johnson and Pintz, 2013; Meyer, Pyatigorsky, Rice, and
Winter, 2013). Guided by the relevant research and the CAEP standards, the key attributes identified that are related to teacher preparation program quality are:

**Input attributes** –
Candidate admission requirements including both academic and non-academic factors, and diversity of incoming candidates.

**Process attributes** –
Quality and substance of curriculum and instruction, quality of clinical experience, faculty and clinical educator qualifications.

**Output attributes** –
Content knowledge, pedagogical knowledge, instructional practice, professional responsibility, higher-order academic skills (i.e. problem solving, critical thinking, etc.), ability to use research and evidence, ability to model and apply technology standards, impact on P-12 student learning and development, completers hiring and job retention rates.

**Table 3.a. Attributes Related to Program Quality and Candidate/Completer Effectiveness and Evidence Used to Measure Them**

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Evidences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT Attributes</strong></td>
<td></td>
</tr>
<tr>
<td>Admission criteria</td>
<td>Standardized Test Scores (PRE/ACT/MME)</td>
</tr>
<tr>
<td></td>
<td>GPA of incoming candidates</td>
</tr>
<tr>
<td></td>
<td>Specific course grades</td>
</tr>
<tr>
<td></td>
<td>Teaching Promise interview metrics</td>
</tr>
<tr>
<td>Recruitment criteria</td>
<td>Percentage of minority students in the incoming class</td>
</tr>
<tr>
<td></td>
<td>Number of candidates in the high-need subject areas</td>
</tr>
<tr>
<td><strong>PROCESS Attributes</strong></td>
<td></td>
</tr>
<tr>
<td>Quality and substance of curriculum and instruction</td>
<td>Course syllabus</td>
</tr>
<tr>
<td></td>
<td>Textbooks</td>
</tr>
<tr>
<td></td>
<td>Course offerings and required hours</td>
</tr>
<tr>
<td></td>
<td>Required courses</td>
</tr>
<tr>
<td>Quality of clinical experience</td>
<td>Clinical work policies and required hours</td>
</tr>
<tr>
<td></td>
<td>Qualifications of clinical educators</td>
</tr>
<tr>
<td></td>
<td>Survey of candidates</td>
</tr>
</tbody>
</table>
OUTPUT Attributes

| Content knowledge, pedagogical knowledge, instructional practice, professional responsibility, higher-order academic skills, ability to use research and evidence, ability to model and apply technology standards |
| CMU Pre-Student Teaching Final Evaluations |
| CMU Student Teaching Final Evaluations |
| CMU Alumni survey |
| CMU Principal survey |
| CMU Common Rubric for a Lesson Plan |
| CMU e-Portfolio Evaluations |
| GPA of major and minor |
| MTTC pass rates |
| MDE Teacher Exit Survey |
| MDE University supervisor survey |
| MDE Year-Out Survey |

| Success in preparing high-quality teachers |
| Teacher Effectiveness Ratings of completers by principals (i.e. effectiveness labels) |
| P-12 student growth data |
| Survey of principals Survey of completer |
| Indicators of teaching effectiveness |

| Effectiveness in preparing new teachers who are employable and stay in the field |
| Teacher Effectiveness Ratings of completers by principals (i.e. effectiveness labels) |
| Pass rates on licensure tests (i.e. MTTC) |
| Hiring and retention rates |
| Rate of completers pursuing advanced studies |

As CMU transitions towards a system of evidence-based practices through the addition of new elements of program and student evaluation, the types and characteristics of evaluation measures have also been revised to meet new expectations. A schematic of the teacher preparation curriculum and the relevant evidence sources/measures is shown in Figure-3.a. The input, process, and output measures evaluate corresponding relevant attributes, i.e., output measures are linked to output attributes (see Table-3.a.). Additionally, the frequencies of these measures vary depending on their applicability to the program. For example, the input attributes measuring the quality of incoming candidates are measured once at the time of candidate entry into the teacher education program. On the other hand, output attributes, such as candidates’ teaching skills, professional dispositions, etc., are measured at multiple points of candidate’s progress in the program to ensure consistent learning and growth. Program level measures occur at a frequency of 1-5 years. Detailed description of the evidence sources and their quality are explained in the subsequent sections.

For the purpose of clarity, the characteristics of each of the measures are determined according to the definitions provided in Table 3.b.

Table 3.b. Characteristics of Measures
Construct Validity | What extent does the evidence measure what it claims to measure?
---|---
Content Validity | Extent to which the evidence measures all facets of a given construct?
Face Validity | Is a measure subjectively viewed as being important and relevant to assessing the intended attribute?
Measurement Vectors | Time when the measure is used, event at which the measure is used, and person/object evaluating the attribute.
Predictive Validity | Is there evidence that teachers graduating from highly rated TPPs prove more effective in the classroom?
Convergent validity | Measures of constructs that theoretically should be related to each other are, in fact, observed to be related to each other

3.1.b.1. Input Measures

a. Standardized Exam Scores (ACT/MME/PRE) and Course Grades (CAEP Standard 3.2)

**Academic ability** of incoming candidates is measured using their ACT or MME (Michigan Merit Exam) or PRE (Professional Readiness Exam) scores, cumulative GPA during admission, and course grades for English Writing Composition (ENG 101 or 201) and Introduction to Teaching (EDU 107). Candidates must meet the following minimum criteria to satisfy the entry requirements for teacher preparation programs.

- A minimum of 45 semester hours of university credit, including transfer credit, successfully completed
- A minimum grade point average (GPA) of 3.00 (implemented fall 2015)
- Completion of English 101 (or one of its approved equivalencies) OR English 201, with a minimum grade of “B-” (2.70)
- Completion of EDU 107 Introduction to Teaching with a minimum grade of ‘B’ (3.00) or an approved equivalency
- Meeting or exceeding the state requirement for Student Teaching by achieving a qualifying score on the ACT/MME or the Professional Readiness Exam (PRE) #096.

**Construct/Content Validity**

Reading, writing and mathematics abilities of incoming candidates are measured by standardized tests such as ACT, PRE and MME. State and national norming of MME/PRE and ACT scores verify content and construct validity thus rendering these assessments as appropriate measures of candidate academic ability. Additionally, cumulative GPA of college credits and specific course grades are used as sources of evidence to measure candidates’ academic strength. Though the
Course grade distributions are monitored at the department level, grades periodically demonstrate gradual inflation due to various latent factors. However, course grades remain one of the commonly used measures in the student learning assessment. The utilization of multiple measures ensures the appropriate quantifying of candidate academic ability.

**Measurement Vectors**

These measures are used at the time of admission to a teacher education program and evaluate candidates’ academic quality and college and career readiness. Coursework completed during this stage demonstrate the candidates’ achievement of writing, mathematics and quantitative reasoning, and oral English competencies as well as their orientation to the teaching profession.

**b. Teaching Promise Evaluation - Interview Metrics**

(CAEP Standard 3.3, Diversity)

In order to measure non-academic abilities that demonstrate teaching promise, such as ability to motivate others, the participation in positive and influencing human interactions, affective skills, leadership abilities, grit, sociocultural awareness, etc., CMU is currently conducting a study on a candidate interview process to include non-academic selection criteria in the admission processes. During the initial year of the research study (AY 2015-16), investigators are (a) testing the interview process crafted from existing research work (Ingles, 2013), (b) concurrently conducting a teacher education expert survey to rank the face validity of the selection criteria and (c) refining the evaluation instrument to measure prospective candidate’s non-academic abilities based on their findings. The research team includes members from P-12 partnerships who are prospective employers of program completers; qualified university faculty and clinical educators. Interviewers/evaluators received training on administering the interview instrument. The candidates participating in the pilot interview process will be monitored for three consecutive years during their program of study to assess their teaching effectiveness and estimate further establish validity of the evaluation method. Upon full implementation of a measurement tool assessing candidate non-academic abilities, further validity of the refined instrument will be established. Each test-study candidate will be monitored over subsequent years to establish further validity for the instrument. Given the lack of any proven research in this area, the current efforts in CMU represent a pioneering contribution and can possibly be utilized by other institutions.

**Construct/Content Validity**

The content validity of the method adopted from the existing research may not be adequate since the results were based on a non-experimental study with 31 samples evaluated by cooperating teachers. There is no evidence longitudinally that a population selected via Ingels (2013) Dispositions and Proficiencies (DAP) method yielded teachers who are effective. The supporting results show that DAP has a correlation (R-square) of 0.16 while GPA has a correlation of 0.03 (Ingels, 2013). This may be partially attributed to a biased sample population. The sample population was not heterogeneous in the sense it was not sampled from lower to higher ranked universities, and there was no control sample to assess the validity
of DAP. Hence, CMU is planning to make significant modifications to the adopted model so that its validity and reliability can be adequately established.

**Measurement Vectors**

When fully implemented, interview metrics will be used at the time of candidate admission into a teacher preparation program.

c. **Incoming Candidate Profiles**  
(CAEP Standard 3.1, Diversity)

Diversity of incoming candidates and graduating program completers were extracted from CMU’s data system that details student demographics, socio-economic status, and other background (rural/urban schooling, first generation) information. CMU is committed to increasing multicultural diversity over the next five years. The percentage of incoming minority students has increased from 7.96% in 2009 to 12.6% in 2014. University-wide plans are focused on increasing this to 20% by the year 2020. This percentage target is congruent with the percentage of minority students represented in the state’s P-12 student population. The distribution of minority students in the teacher education program and the number of candidates in the high-need subject areas were analyzed, and a program level disaggregation is under analysis to design future recruitment plans.

3.b.2. **Process Measures**

a. **The Curricular Path – Content and Quality Assurance**  
(CAEP Standards 5.1, 5.2, Technology, Diversity)

Quality and substance of curriculum and instruction are ensured by several requirements such as mandated coursework, master course syllabi, textbooks, minimum requisite credit hours, rigorous course offerings, etc. At CMU, the curricular content, credit hour designation, and course level rationale of every course syllabus is subjected to a multi-tier evaluation process involving the disciplinary department, the resident college, the Professional Education Curriculum Committee (PECC), the Professional Education Executive Board (PEEB), other respective senate committees, and ultimately presented to the Michigan Department of Education for endorsement and approval. During the program approval process, a curriculum mapping process aligns student learning outcomes forwarded in state, national and local standards with program course objectives to ensure the substance and quality of the curriculum.

Teacher preparation courses are designed to provide candidates with (a) comprehensive knowledge, understandings, evaluative skills, critical inquiry and structure of the content; (b) understandings of how learners grow and develop, recognizing the pattern of learning and development, individual difference and diverse cultures to ensure inclusive learning environments; (c) ability to design, teach, and assess content instruction for diverse learners and utilize innovative technology in accordance with state and national standards; (d) knowledge and practice to utilize appropriate assessment tools and implementation strategies to improve instruction, student growth and curriculum planning; (e) knowledge of current research and best practices in the content area education and opportunities
to develop the dispositions and characteristics of a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professional in the learning community) and who actively seeks opportunities to grow professionally; and (f) opportunities to develop and demonstrate application of the technology competencies to assist student learning and development as guided by the state/national technology standards.

Pedagogical knowledge, assessment skills, tenets of reflective practice and other professional responsibilities are introduced, reinforced and emphasized within the coursework of the professional education sequence common to all teacher education candidates and also in methods courses in the contents areas. Content knowledge, research, inquiry and best practices in the content area are introduced, reinforced and emphasized in the respective major/minor courses.

**Measurement Vectors**

Candidates’ performance outcomes resulting from preparation are measured using both program-specific assessments and common assessment measures. These include course grades, performance evaluations, capstone research project evaluations, licensure examination pass rates, completer/employer satisfaction and other effectiveness measures. For details of the output measures, please refer to section 3.b.3. later in this chapter.

**b. Quality of Clinical Experiences**  
(CAEP Standards 2.1, 2.3, 5.2, Technology, Diversity)

The quality of clinical experiences is monitored and ensured via clinical coursework, required hours of practice, type of clinical experience, quality of clinical educators, partnerships and practices. Clinical experiences represent the heart of educator preparation program and provide a wide array of opportunities for teacher candidates to practice teaching (e.g. lesson planning, instruction, assessment, classroom management, communication with parents, individualized education program meetings, staff meetings), mentored and monitored by the cooperating teachers and university supervisors. Clinical experiences begin with observations and gradually moves the candidate towards becoming a student teacher. The Center for Clinical Experience (CCE) and the Clinical Partnership and Practice Committee (CPPC) ensure and maintain the quality of clinical experiences through strong PK-16 partnerships, planning and implementing current research and best practices in exemplary teacher preparation, such as co-teaching models, selection, training, and evaluation of clinical educators and organizing professional development activities for university supervisors and teacher candidates.

The Center for Clinical Experience at CMU is currently involved with two levels of partnerships: (a) affiliation agreements involving nearly 400 out of the 550 school districts across the State of Michigan. Affiliation agreements are designed to detail the general agreement between the school district and CMU as related to student teaching, pre-student teaching and other course-related clinical placements in the PEU; and (b) unique working partnerships between CMU and local school
districts that support joint ventures of clinical experiences for CMU students and curricular innovation for the students and instructors in local school districts. These partnerships include STEM partnerships (including technology-based collaborations), global field experiences, and other community-based partnerships. Each of these partnerships provides unique clinical experience opportunities to teacher candidates increasing opportunities to work with diverse students, and explores education STEM fields and the community.

The quality of clinical experiences is assured through candidate surveys i.e. MDE Teacher Exit Survey, MDE Year-Out Survey and CMU Alumni Survey and feedback from faculty, university supervisors, and P-12 partners. The quality and other details of these evidences are explained in the next section of this chapter.

There are a number of other process attributes involved in shaping teacher preparation programs, such as student support services and program facilities and resources.

3.b.3. Output Measures

a. Pre-student Teaching Final Evaluation

(CAEP Standard 1.1, 1.3, 3.4, Technology, Diversity)

CMU’s Pre-Student Teaching Final Evaluation measures candidates’ level of competency in the areas of learning environment, communication skills and professionalism in the school environment. These measures correspond to: (a) The Learner and Learning, Instructional Practice, and Professional Responsibilities areas of InTASC standards; (b) Professional Standards for Michigan Teachers; (c) CMU’s CLeaR Conceptual Model, and (d) the Common Core Standards. The intended use of this evaluation is to record the progress of development of the candidate and provide an opportunity for the candidate to receive corrective feedback on his/her instructional development to encourage reflection and growth.

The Pre-Student Teaching Final Evaluation was jointly developed by university professionals and P-12 representatives (i.e. cooperating teachers). The instrument was initially piloted by a select group of P-12 cooperating teachers to analyze the items for quality and consistency. After subsequent revisions involving all stakeholders, the Pre-Student Teaching Final Evaluation was fully implemented during the 2012 fall semester.

Revisions

In summer 2015, the PEU revised and realigned common assessments to improve the quality of instruments and ensure correlation to the new CAEP standards using the CAEP assessment rubric as a guide. Also, efforts have been made to align the Pre-Student Teaching Final Evaluation with the metrics and methods used in Michigan schools to evaluate new teachers. The field testing of the revised Pre-Student Teaching Final Evaluation is scheduled for spring 2016. The field testing cycle includes training, evaluation, and feedback.
Construct/Content Validity
The revised Pre-Student Teaching Final Evaluation incorporates the content standards from InTASC and the evaluation criteria of the Danielson Model of Teacher Evaluation since the Danielson Model of Teacher Evaluation has been approved by Michigan Department of Education as an option for teacher evaluation and is currently the most commonly used teacher evaluation tool in Michigan (Vaugh, 2012). The revised Pre-Student Teaching Final Evaluation also elicits input from candidates thus engaging them in developmentally appropriate self-evaluation (Danielson, 2011).

Measurement Vectors
During the pre-student teaching experience, candidates are placed with a P-12 cooperating teacher in their content major area. This experience typically occurs during the candidate’s third year in the B.S. in Education program. Candidates attend their placements one to two times per week. The Pre-Student Teaching Final Evaluation is completed by the cooperating teachers and is collected at the end of the pre-student teaching clinical experience which occurs at the end of the 16 week semester. Supervision of the process is facilitated by the Center for Clinical Experiences and Professional Education Faculty who teach courses associated with the pre-student teaching experience. Currently, the evaluations are paper-based and are scheduled to be migrated to the newly implemented Taskstream® system in fall 2016. The new system will enable computer-based evaluations.

Reliability and Face Validity
Training related to completing the form and scoring the competency categories for the Pre-Student Teaching Final Evaluation is conducted by the Center for Clinical Experience’s Director of Pre-Student Teaching. Each semester, the Director of Pre-Student Teaching facilitates information sessions with P-12 cooperating teachers regarding the pre-student teaching experience and the final evaluation. Directions for completing the Pre-Student Teaching Final Evaluation are also included in the Clinical Handbook which is provided to all P-12 cooperating teachers. All Pre-Student Teaching Final Evaluations are reviewed by the Director of Pre-Student Teaching.

b. Student Teaching Final Evaluation
(CAEP Standard 1.1, 1.2, 1.3, 1.4, 1.5, 3.5, 3.6, Technology, Diversity)
The Student Teaching Final Evaluation measures candidate’s level of competency in six domains: (a) planning skills; (b) teaching skills; (c) learning environment; (d) assessment skills; (e) professionalism; and (f) communication skills. These measures correspond directly with the InTASC standards related to the use of research and evidence, the ability to teach College and Career Ready standards, and with the technology standards articulated in CAEP. The instrument is also aligned with Professional Standards for Michigan Teachers and CMU’s CLeaR Conceptual Model. The intended use of the Student Teaching Final Evaluation is to record the progress of the candidate’s development and provide an opportunity for candidates to receive corrective feedback concerning their instructional practice to encourage reflection and growth.
The instrument was developed through discussion and reflection among multiple key stakeholders including the P-12 cooperating teachers, candidates, faculty, and clinical experience supervisors. The involvement of the candidates in the development of the Final Student Teaching Evaluation supports validity and promotes the concept of self-reflection allowing candidates a formal venue to verbalize their thoughts on improving their professional practice and elevating the quality of their work. Pilot studies were completed using a draft of the Final Student Teaching Evaluation during which university faculty, P-12 cooperating teachers, clinical experience supervisors and candidates were provided opportunities to provide feedback and suggestions for modification were incorporated in fall, 2012.

Revisions
In summer 2015, the PEU revised and realigned common assessments to improve the quality of instruments ensure correlation to the new CAEP standards using the CAEP assessment rubric as a guide. Also, efforts have been made to align the Student Teaching Final Evaluation with the metrics and methods used in Michigan schools to evaluate new teachers. The field testing of the revised Student Teaching Final Evaluation is scheduled for spring 2016. The field testing cycle includes training, evaluation, and feedback. Currently, the evaluation is completed by cooperating teachers and endorsed by the university supervisors. In the revised system, the evaluation will be completed independently by the university supervisors, cooperating teachers and candidates.

Construct/Content Validity
The revised Student Teaching Final Evaluation incorporates the content standards from InTASC and the evaluation criteria of the Danielson Model of Teacher Evaluation since the Danielson Model of Teacher Evaluation has been approved by Michigan Department of Education as an option for teacher evaluation and is currently the most commonly used teacher evaluation tool in Michigan (Vaugh, 2012). The revised Student Teaching Final Evaluation also elicits input from candidates thus engaging them in developmentally appropriate self-evaluation (Danielson, 2011).

Measurement Vector
The Student Teaching Final Evaluation is completed at the end of a candidate’s 16 week student teaching clinical experience by the cooperating teachers. The Student Teaching Final Evaluation represents a comprehensive evaluation of candidate’s performance during the student teaching clinical experience. Currently, the evaluations are web-based and will be migrated to the newly implemented Taskstream® system during the fall 2016 semester.

Evaluator Training
Clinical experience university supervisors are trained in the use of the Student Teaching Final Evaluation by a clinical experience center leader. Clinical experience supervisors review and discuss the implementation of the Final Student Teaching Evaluation with P-12 cooperating teachers each semester. Moreover, in
professional development sessions with the Director of Clinical Experiences, the Director facilitates understanding proper and consistent use of the Final Student Teaching Evaluation through guided practice. The PEU is currently developing an online training module for clinical educators to provide a standard reference for communication to insure homogeneity and alignment. The new training module is scheduled for release in fall 2016.

Reliability and Face Validity
A field test is in development to establish inter-rater reliability of the revised Student Teaching Final Evaluation. The testing protocol details the collection of evaluation ratings for the same student, at the same time period of evaluation, from various entities, i.e., university supervisors and cooperating teachers. The data will comprise evaluations from multiple raters that can be used to establish inter-rater reliability.

c. CMU Principal Survey
(CAEP Standard 1.1, 1.2, 1.3, 1.4, 1.5, Technology, Diversity)
Principal Survey data provide feedback from key employers of CMU teacher education alumni related to the on-the-job success of CMU graduates. The first part of survey is organized around six dimensions: (a) subject matter; (b) pedagogy; (c) diversity; (d) assessment; (e) technology; and (f) professionalism. Questions in this section are directed only at those principals who hired a new (that is, first time to teaching) CMU graduate in the previous year. In this section, respondents are asked to indicate how well they believe CMU prepares its graduates in each of the six dimensions. The second section of the Principal Survey poses four questions and is directed at those principals who have one or more CMU graduates on their staff. This section focuses on how well CMU alumni teachers are prepared to teach, the responding principal’s willingness to hire another CMU graduate, and an assessment of the strengths and the weaknesses of teachers who are CMU graduates. The survey was conducted by the Center for Applied Research and Rural Studies (CARRS) at CMU.

Construct/Content Validity
The Principal Survey has been validated in four ways. First, the format of the items is consistent with that used in numerous other surveys, including the BS in Education Alumni Survey used by CMU. Second, after the administration of the survey and the reporting of findings, the items were reviewed both by the Director in charge of accreditation and by the faculty members of Professional Education Assessment Committee (PEAC). Items have the endorsement of CMU professionals in the field of education. Third, there is also useful variance across items and response sets were minimal. Fourth, there is a possible triangulation between the responses to the closed-ended and open-ended questions within the survey, suggesting construct validity. For example, both the qualitative and the quantitative data suggest high principal satisfaction with CMU graduates.

Measurement Vectors
The Principal Survey is administered in the spring of each year. The targeted population for this survey is Michigan employers of program completers.
Reliability
Based on the data from 2014, 1590 principals were invited to complete the survey and data from 342 principals were collected and analyzed. The six dimensions were reduced to three factors using standard dimensionality-reduction techniques and assessed for the factor loadings. The factor loadings ranged between 0.35 and 0.87. The Cronbach alpha for all the items included in the six dimensions was estimated to be 0.92. Using multiple correlation analyses, each of the individual items under the six dimensions were correlated with a comprehensive rating (single overall preparedness), and the results ranged between 0.40 and 0.61.

d. CMU Alumni Survey
(CAEP Standard 1.1, 1.2, 1.3, 1.4, 1.5, Technology, Diversity)
The Alumni Survey data provide alumni self-reports on the extent to which key learning objectives have been achieved. In addition, the Alumni Survey provides faculty and staff with feedback on alumni views of the organization of the program and its support services. The Alumni Survey has three main substantive sections. The first section is organized around six dimensions: (a) subject matter; (b) pedagogy; (c) diversity; (d) assessment; (e) technology; and (f) professionalism. Respondents are asked to indicate how well the CMU teacher education program prepared them to teach. The second section poses a series of questions allowing respondents to indicate their views about 15 components of the teacher education program, divided into four key areas – advisement, resources, course work, and clinical experience. The third section asks respondents to report on their work history since receiving their BS in Education degree, with a focus on their teaching experiences. The Alumni Survey was conducted by the CARRS at CMU.

Measurement Vectors
The Alumni Survey is administered in the spring of each year. The Alumni Survey sample consists of all alumni who graduated with a BS in Education degree within one year and three years from the time of survey administration. Consequently, each graduate will receive an alumni survey at two points in time after their graduation.

Construct/Content Validity
The instrument has been validated in four ways. First, the format of the items is consistent with that used in numerous other alumni assessment surveys. Second, after the administration of the survey and review of findings, the items were reviewed both by the Director in charge of accreditation and by the faculty members of Professional Education Assessment Committee (PEAC). Items have the endorsement of CMU professionals in the field. Third, there is also useful variance across items and the response sets were minimal. Fourth, there is a possible triangulation between the responses to the closed-ended and open-ended questions within the survey, suggesting construct validity. For example, both the qualitative and the quantitative data suggest alumni satisfaction with field experiences.

Convergent Validity
Subgroup analyses (for example, of alumni with elementary education versus special education degrees and alumni from 2010-12 versus 2012-13) yield findings which are expected (and consequently lead to views of instrument trustworthiness). Special education alumni tend to feel prepared in the area of diversity when compared to the elementary education alumni, and recent graduates are less likely than graduates “three years out” to be employed full-time as teachers.

**Reliability**
Based on the data from 2014, 962 alumni were invited to complete the survey and data from 304 respondents were collected and analyzed. The factor loadings ranged between 0.63 and 0.87. The Cronbach alpha for all the items included in the six dimensions was estimated to be 0.91. Using multiple correlation analyses, each of the individual items under the six dimensions were correlated with a comprehensive rating (single overall preparedness), and the results ranged between 0.39 and 0.53.

d. Common Rubric for a Lesson Plan
**(CAEP Standards 1.1, 3.4)**
The Common Rubric for a Lesson Plan is used to evaluate the lesson plans developed by the candidates during the program. The rubric aligns directly with CAEP Standard 1.1, which calls for teacher candidates to demonstrate an understanding of the 10 InTASC standards. The rubric measures seven out of 10 InTASC standards common to lesson plans across disciplines: (a) Standard #1: Learner development; (b) Standard #2: Learning differences; (c) Standard #4: Content knowledge; (d) Standard #5: Application of content; (e) Standard #6: Assessment; (f) Standard #7: Planning for instruction; and (g) Standard #8: Instructional strategies.

**Measurement Vectors**
The rubric can be employed at different course levels wherever pedagogical knowledge and lesson planning are addressed. Lesson plans are mostly evaluated by university faculty and supervisors at clinical and non-clinical settings.

**Validity**
The Common Rubric for a Lesson Plan was developed through a faculty-led process coordinated by PEAC and the Office of Planning & Research within the PEU. Professional Education Faculty developed a common rubric, rating system and language to evaluate candidate lesson plans. The rubric is currently being piloted in student teaching experiences. Clinical experience faculty have been trained on using this rubric, and the training consisted of gaining proficiency with the rubric content and expectations, simulation scoring of candidate lesson plans, and discussion of scoring inconsistencies. Simulation scoring was continued until inter-rater reliability was above 90%. Additional training and implementation will continue during the 2015-2016 academic year.

e. CMU e-Portfolio Evaluations
**(CAEP Standards 1.1, 3.4)**
Teacher preparation candidates develop a comprehensive e-Portfolio during their student teaching experience. CMU has a well-established e-Portfolio schema that has evolved over several years. Currently, the PEU is revising the rubrics of e-Portfolio to map with the new CAEP standards.

**g. Hiring and Retention Rates**  
*(CAEP Standards 4.3)*

The PEU tracks the employment status of teacher education program completers through one or more of the following: (a) an Alumni Survey administered both in-state and out-of-state (b) the Year-Out-Survey administered by the State tracking completers teaching in the state of Michigan 1 to 3 years after graduation and (c) the Registry of Educational Personnel (REP), a statewide database containing data about teachers employed in Michigan’s public K–12 schools. While these means may provide information on approximate employment and retention rates, problems associated with out-of-state tracking and low survey responses persist. For example, the maximum response rate for the alumni survey was 34.93% during the last three years, the MDE Year-Out-Survey completion rate by CMU graduates was 19.2% in 2014, and the statewide database assistance was limited to 47.46% of the CMU previous program completers. The resultant data may have statistical bias due to the low response rates.

**h. Rate of Completers Pursuing Advanced Studies**

The rate of completers pursuing advanced studies is tracked through the *StudentTracker* service available from National Student Clearing House (NSCH). The *StudentTracker* provides indirect access to nation-wide post-secondary enrollment and graduation data for the candidate groups. The service includes all type of post-secondary institutions: In-state, out-of-state, two-year, four-year, public, private and others.

**i. Completers’ Impact on P-12 students’ Learning and development**  
*(CAEP Standards 1.3, 4.1, 4.2, 5.1, 5.2, 5.4)*

Michigan currently does not have a data system that provides access to State P-12 student learning data, and hence CMU has initiated a teaching effectiveness case study to investigate completers’ impact on P-12 student learning and development and effective application of professional knowledge, skills and dispositions. The resulting data will inform the evidence-based system to develop new metrics and evaluation methods.

**j. Michigan Test for Teacher Certification (MTTC)**  
*(CAEP Standard 1.1, 1.3, 1.4, 3.5, 5.1, 5.2, Technology, Diversity)*

The Michigan Test for Teacher Certification (MTTC) is a standardized criterion-referenced test managed by Pearson. This multiple choice licensure exam is designed to measure candidate professional readiness and content knowledge. Passing criteria is based on an established standard of performance related to the level of knowledge required for a candidate to be an effective entry-level educator in their area of specialization. The MTTC is administered in either a paper-based or computer-based format at MDE approved sites across Michigan.
candidates are assessed at the end of their program of study to measure content knowledge and pedagogical skills.

k. MDE Teacher Exit Survey and University Supervisor Survey
(CAEP Standard 1.1, 1.2, 1.3, 1.4, 1.5, Technology, Diversity)
The MDE Teacher Exit Survey and MDE University Supervisor Survey are aligned with the Professional Standards for Michigan Teachers (PSMTs) and the Michigan Interstate Teacher Assessment and Support Consortium (MI-InTASC) standards (MDE, 2015). Michigan Department of Education administers each survey biannually. Candidates complete the MDE Teacher Exit Survey electronically subsequent to finishing their final clinical experience. University clinical supervisors electronically complete the MDE University Supervisor Survey to assess their candidates as they complete their final clinical experience. MDE began administering a similar survey with cooperating teachers in 2014-15.

l. MDE Year-Out-Survey
(CAEP Standard 1.1, 1.2, 1.3, 1.4, 1.5, 4.4, 5.5, Technology, Diversity)
The MDE Year-Out Survey was newly developed in the year 2014. The survey presents perception data revealing how completers feel about their preparation as educators and assesses respondents’ perceptions related to content knowledge, pedagogy, diversity, technology and clinical experience. Completers teaching in the state of Michigan 1 to 3 years after graduation submit this survey electronically.

m. MDE Teacher Effectiveness Labels
(CAEP Standard 1.1, 1.2, 1.3, 1.4, 1.5, 5.3, 5.5)
According to Michigan’s legislation, teachers are annually evaluated and assigned teacher effectiveness labels, indicating whether teachers are considered “Highly Effective -1,” “Effective -2,” “Minimally Effective -3,” and “Ineffective -4” based to several factors, including P-12 student academic growth on statewide assessments. Once each year, MDE provides educator preparation institutions their completers’ teacher effectiveness labels which are captured by the Registry of Educational Personnel (REP), a statewide database containing data about teachers and other staff employed in Michigan’s public K–12 schools. The data include information about teacher assignment, certification validity and expiration, work site, and employment intensity status, and years of experience, among other details.

3.c. Longitudinal Study on the Effect of Attributes on Teacher Effectiveness
(CAEP Standards 4.2, 5.1, 5.2, 5.3, 5.5)
The two major metrics that can estimate the success of a teacher candidate are (a) the teacher effectiveness rating assessed by the principals of K-12/P-12 schools and (b) the measured positive influence of student growth in K-12/P-12 schools. In this longitudinal study, a subpopulation of 80 CMU alumni who were placed across Michigan schools were chosen to estimate the effect of their input/process/output attributes on their teaching effectiveness. The independent variables include high-school GPA, CMU GPA before admitting to the teacher education, final CMU GPA, Pre-Student Teaching Evaluation, Final Student
Teaching Evaluation by cooperating teachers and Final Student Teaching Evaluation by university supervisors. The dependent variables employed in this study were the MDE Teacher Effectiveness labels. A multinomial logistic regression model was employed to determine the influence of the independent variables in predicting the dependent variable, i.e., the teacher effectiveness. Figure 3.c. shows the characteristics of the individual variables and the six weights indicate the degree of predictive influence of each independent variable on the dependent variable.

**Figure 3.c. Characteristics of Variables and Degree of Predictive Influence**

![Graph showing characteristics of variables and degree of predictive influence](image)

**Construct Validity**
The model measures the relationship between the independent and dependent variables using standard mathematical techniques. The model captures linear relationships only. Additionally, applying the statistical model to a sample size was 80 indicates a statistically large sample. The surveys and effectiveness labels are skewed and may not present adequate dispersion.

**Content Validity**
The model does not include alumni surveys or any other self-reflective measures. However, since the dependent variable is a repeated performance measure, the model is adequate in its content.

**Convergent Validity**
The student teaching evaluations by the university supervisors demonstrated higher probability of predicting teacher effectiveness. This is expected as most university supervisors have previous experience as school principals and are experienced at evaluating teacher effectiveness on par with currently employed school principals.

**Reliability**
The data sample size is statistically adequate. The correlation between the input variables were very weak demonstrated by a value of <0.2.

**Predictive Validity**
The weights of the independent variables reflect the predictive validity of the six independent variables. High-school GPA demonstrated the least predictive influence on a candidate becoming an effective teacher and the Final Student Teaching Evaluations by the university supervisors presented the highest predictability on the teaching effectiveness.