

COMPETENCY BASED EDUCATION

ENGINEERING SCHOOLS

A blueprint for planning, executing,
measuring, and scaling a student
competency assessment infrastructure.



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BUILDING A CBE HOME

It's an exciting time to be involved with the education and mentorship of our next generation of graduates. Rethinking the way we engage with students and how we measure success is paramount especially when incorporating a competency based assessment initiative. Having a strong partner and concise plan can take what may seem like an overwhelming task, and make you feel at home.

A good analogy to establishing and executing a competency based education (CBE) initiative is the process of building a home, so we will use this analogy throughout the CBE Blueprint.

Every home is different, and so is every institution. The following CBE Blueprint is a simple, flexible, and scalable framework that can be easily modified and customized to accommodate the CBE requirements and vision of your institution.

To ensure success, an experienced partner (architect) is needed to provide the technology, guidance, training, examples/templates, and best practices. CORE Higher Education Group provides not only the technology platform (CORE CompMS™), but also the guidance and proven examples to execute a complete CBE initiative. CORE's CompMS software has the flexibility to accommodate the unique needs of an individual program, and has the scalability to accommodate the needs and requirements of an entire university.



GOAL ALIGNMENT

The goals of this CBE Blueprint and the CompMS software are to:

1. Improve the learning experience for students
2. Measure student and cohort achievement with respect to individual competencies
3. Map competencies to courses for curriculum gap identification
4. Collect, organize, store, and retrieve actionable student competency data for:
 - Accreditation needs
 - Measurement of outcomes achievement
 - Curriculum adjustment (influence positive change)
 - Institutional marketing (student recruitment)
 - Student presentation (externship & employment interviews)
5. Establish a scalable infrastructure and a flexible plan for inevitable growth, change, and potential inclusion of additional outcomes.

Establishing clear goals and communicating these goals to all stakeholders is critical when starting a CBE program. If the goals of your program align with the goals listed above, CORE Higher Education Group can be a great partner to help you design, launch, and support your CBE initiative.



CBE BLUEPRINT

(THE 7 STEPS)



CORE Higher Education Group's CBE Blueprint is comprised of seven steps, and the CORE Implementation Team provides support through every step in the process.

The Blueprint is built upon the industry-leading technology platform (CORE CompMS), and offers customizable templates, examples, training, and best practices learned from ten years of working with our partner schools.

The Seven Steps:

- ① Establish Goals
- ② Plan & Prepare
- ③ Technology Platform
- ④ Build-Out
 - Outcomes & Competencies List
 - Curriculum Mapping
 - Competency Assessment Execution Plan (CAEP)
 - LMS Integration
 - Beta Test
- ⑤ Execution
- ⑥ Report & Review
- ⑦ Improve



STEP 1: ESTABLISH GOALS (NEEDS ASSESSMENT)



The first step in building a home is to establish high-level goals such as budget, location, and style. For a CBE initiative, the assessment committee must establish high-level goals to properly plan for the execution of the CBE initiative.

- *What will be the benefits and takeaways for your students?*
- *What are the accreditation needs and requirements?*
- *What will be the overall timeline for implementation?*
- *What will be the level of student involvement?*
- *What will be the level of faculty involvement?*
- *Do the goals of your program align with the goals of the university?*

Templates Provided



BLUEPRINT
CHECKLIST



BLUEPRINT
IMPLEMENTATION
QUESTIONNAIRE

STEP 2: PLAN & PREPARE (THE BLUEPRINTS)



The second step in your CBE initiative is the planning and preparation phase; blueprints will be needed. Planning your CBE initiative will require building blocks such as the establishment of communication plans, defining roles and responsibilities, and the development of annual benchmarks.

Preparatory building blocks include:

- Establishment of an assessment committee
- Determination of responsibilities and roles within the committee
- Development of a “key terms” list
- Establishment of a communication plan for students, faculty, and other stakeholders
- Establishment of reasonable and attainable goals for successive years:
 - Year 1?** (e.g. Preparation and establishment of the framework)
 - Year 2?** (e.g. Launch with limited student engagement)
 - Year 3?** (e.g. Full student engagement and limited faculty engagement)
 - Year 4?** (e.g. Full student and full faculty engagement)
- Definition of student cohorts
- Establishment of likert scales and corresponding rubrics
- Development of training and instructional resources

Templates Provided



DOCUMENT
TEMPLATE LIST



STAKEHOLDER
REGISTRY & ROLES



COMMUNICATION
PLAN



KEY TERMS LIST



TRAINING
RESOURCES

STEP 3: TECHNOLOGY PLATFORM (THE LAND)



The program is going to need “land” for the CBE initiative; essentially the platform upon which everything is built. CORE’s Competency Management System (CompMS) is the technology platform supporting the CBE initiative. Among other functions, CompMS serves to collect, aggregate, and report on the micro and macro student competency assessment data collected throughout the curriculum.

CompMS manages all aspects of competency assessment and data including:

- Management of Students
- Management of Faculty
- Communication Tools
- Competency Library Management
- Curriculum Mapping
- Competency Observation Collection, Aggregation, and Reporting
- Generation of Competency Certificates and Competency Transcripts
- Analytics and Reporting
- Document and Resource Libraries

Templates Provided



OUTCOMES &
COMPETENCIES LIST



CompMS
ADMINISTRATOR
LIST



LIKERT SCALE &
RUBRICS



FACULTY LIST



STUDENT LIST



STEP 4: BUILD-OUT (CONSTRUCTION)



Now that high-level goals have been established, preliminary planning completed, and a technology platform decided upon, it is time to construct the CBE initiative. The build-out is divided into FIVE components:

Step 4a - Outcomes & Competencies (The Foundation)

Step 4b - Curriculum Mapping (The Framing)

Step 4c - CAEP (The Plumbing)

Step 4d - LMS Integration (The Wiring)

Step 4e - Beta Test (The Walk-Through)

STEP 4a:

OUTCOMES & COMPETENCIES (THE FOUNDATION)



It is now time to construct the foundation of the CBE initiative, with the development of an Outcomes and Competencies List.

The Assessment Committee must guide the development of an Outcomes and Competencies List. Programmatic outcomes are identified, and individual competencies established under each outcome. Demonstrated achievement of each competency under a particular outcome will indicate the student's attainment of the outcome.

Individual outcomes and underlying competencies are primarily guided by the following factors:

- Programmatic mission
- Institutional mission
- Employer and market needs
- Accreditation requirements

Once established, the Outcomes and Competencies List is loaded into CompMS by the CORE Implementation Team, creating a "Competency Library" within the application.

Templates Provided



OUTCOMES &
COMPETENCIES LIST



STEP 4b:

CURRICULUM MAPPING (THE FRAMING)



Now that a Competency Library has been established in your CompMS, it is time for the framing, or mapping, of your competencies to your course curriculum, and to national Standard Competencies.

A Curriculum Mapping Key must be established to provide guidance to faculty for mapping purposes. The key provides instructions, and defines mapping criteria for your faculty. Mapping criteria may include standard, as well as custom criteria, including:

- *Degree of Association (strong, moderate, weak)*
- *Where Demonstrated (clinical, externship, etc)*
- *Assessment Setting (didactic, experiential)*
- *Assessment Type (formative, summative)*
- *Pedagogy (lecture, writing, etc)*

Mapping competencies to individual courses achieves the following:

- Identification of gaps in the curriculum as it relates to competencies

STEP 4b: CURRICULUM MAPPING (THE FRAMING)



- Identification of course-to-competency relationships
- Establishment of a roadmap to the build-out of your CAEP (Competency Assessment Execution Plan)

Mapping competencies to individual Outcomes achieves the following:

- Identification of gaps in the curriculum as it relates to Outcomes & Standards

Templates Provided



COURSE LIST



ACCREDITOR
OUTCOMES LIST



CURRICULUM
MAPPING KEY



CURRICULUM MAPPING
SHARED SPREADSHEET

STEP 4c: CAEP (THE PLUMBING)



Now that competencies have been mapped to individual courses, the next step is the plumbing, which is the development of the Competency Assessment Execution Plan (CAEP), and ties the CBE initiative together.

- *How will students know when to perform self-assessment observations for particular competencies?*
- *What is the expectation of a particular assessment observation?*
- *How will faculty advisors know when to perform assessment/observations for a particular cohort of students?*

Determined through the curricular mapping process, the CAEP associates specific competencies with specific courses, and guides the stakeholders (students, faculty, faculty advisors) on timelines and expectations relating to the various competency assessments they will perform throughout the year. Scaling up the CAEP is how a program will scale up the CBE initiative over time. The CAEP establishes and communicates the “Where,” “What,” “Who,” “How,” and “When” as they relate to individual competency assessment observations.

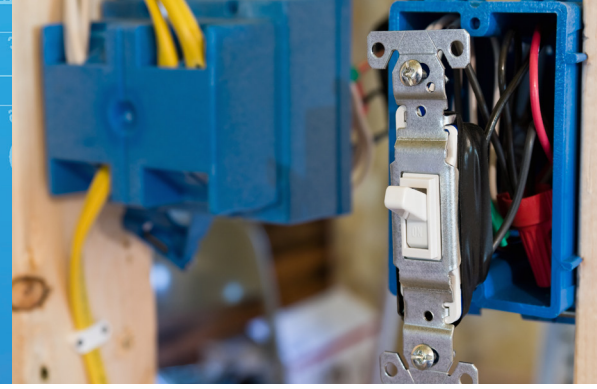
- **Where** *is the competency observation to take place (course)?*
- **What** *is the specific competency to be addressed?*
- **Who** *will be making the competency observation?*
- **How** *is the observation going to be assessed (expectation)?*
- **When** *will the competency observation take place?*

Templates Provided



CAEP

STEP 4d: LMS INTEGRATION (THE WIRING)



The CAEP has now been established and your CompMS technology platform implemented. Next comes the wiring – the potential integration of CompMS with your LMS (Learning Management System).

Integrating with your LMS (e.g. Blackboard™, Canvas™, Moodle™, Sakai™, etc.) is optional, has pros and cons, and is dependent on the goals of your institution.

- *Does your program require single-sign-on by your students through your LMS, or will your students and faculty log into the CompMS directly?*
- *What data needs to be imported into your LMS, if any?*
- *What data needs to be exported from your LMS, if any?*

Templates Provided



INTEROPERABILITY
PLAN



STEP 4e: BETA TEST (THE WALK-THROUGH)



With the CBE framework now in place, it is time for the final walk-through prior to execution, the beta testing.

Prior to going live with students and faculty, the process should be beta tested with a handful of faculty or assessment committee members. Following an abbreviated CAEP, the beta-testers will experience the process as your students will experience it.

From data collected during the beta test phase, examples of student competency reports can be run and assessed. Final adjustments can be made to the CAEP and the overall process prior to going live with the first cohort of students.

Templates Provided



PRESENTATION
ePORTFOLIO
EXAMPLES

STEP 5: EXECUTION (MOVING IN)

With a CBE framework in place and beta tested, your school is ready to go live with students and faculty.

Following the Communication Plan, students and faculty are introduced to the CAEP. Formative and summative competency data is collected in the form of competency observation assessments throughout the year.



Competency Certificates are generated for students as observations/assessments are performed for individual competencies.



A Competency Transcript begins to develop for individual students containing their collection of individual Competency Certificates.



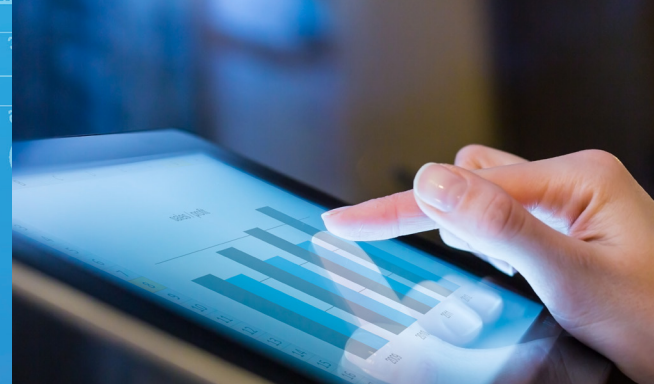
Students can selectively add Competency Certificates and the Competency Transcript to their “presentation” ePortfolio (MyCred) to share with employers, experiential educators, clients, and colleagues.

Templates Provided



PRESENTATION
ePORTFOLIO
EXAMPLES

STEP 6: REPORT & REVIEW (MEASURE SUCCESS)



A semester has now been spent executing the CAEP and collecting micro and macro student competency data via CompMS. Measuring success at both the student level and the programmatic level is now accomplished via the CompMS reporting suite. Qualitative and quantitative data collected from didactic and experiential observations can now be analyzed, presented, and acted upon.

- *How has a specific student cohort performed on a particular competency?*
- *How has a specific student performed on a particular competency?*
- *Which students may require intervention?*
- *What are the specific observation artifacts for a particular student on a specific competency?*
- *How many Competency Certificates have been generated for a particular cohort of students?*
- *What does the Competency Transcript look like for a particular student?*

Templates Provided



COMPETENCY
TRANSCRIPT

STEP 7: IMPROVE (ADD A POOL)

From the data collected, your institution may want to make improvements – perhaps add a pool to your CBE home.

The CBE framework constructed is both flexible and scalable, so making changes and improvements for future competency assessment will be simple and manageable. Scaling the CBE initiative can now be planned, communicated, executed, and measured with minimal burden to the faculty, students, and administration.

What are the goals for year two and beyond?

- *Incorporate additional competencies?*
- *Incorporate additional stakeholders and observers into the process?*
- *Apply additional assessment techniques (e.g. student peer review)?*
- *Fine-tune your CAEP?*
- *Require additional observations?*
- *Add additional rubric criteria?*
- *Account for additional accreditation requirements?*
- *Introduce particular competencies earlier in the curriculum?*

Templates Provided



CAEP



CONCLUSION

We hope our CBE Blueprint is helpful in explaining the high-level concepts of launching and managing a successful CBE initiative.

CORE Higher Education Group leverages ten years of experience in partnering with our schools to guide them through every step of the CBE process. Our industry-leading CompMS software, customizable templates, detailed checklists, training, and extensive knowledge of best practices make us the ideal partner. If your school is looking for a trusted partner that can provide the foundational technology and full CBE Blueprint for planning, executing, measuring, improving, and scaling your program's CBE program, CORE Higher Education Group is here to help.

To schedule an exploratory conversation and a demonstration of our CompMS software application, please contact a CORE representative at www.CoreHigherEd.com.