IMSA
Illinois Mathematics and Science Academy

STEM Equity Program Evaluation Rubric
Center for Teaching and Learning (CTL)
Summary of Findings
January 19 – February 5, 2021

Executive Summary

The STEM Equity Program Evaluation Rubric is designed to help program administrators, designers, implementers and funders identify the critical attributes of a STEM program to determine the degree to which it is inclusive and supports access and success for students who historically have not engaged in STEM. Serving "all students" does not ensure equity, so considering how each of these attributes impacts underrepresented students in STEM and addressing those barriers will create a STEM learning environment where every student can succeed (NAPE, 2019).

Six members of IMSA's Center for Teaching and Learning completed the rubric from Tuesday, January 19, 2021 through Friday, February 5, 2021. Below is a summary of the results.

Summary of Findings

- The two highest rated attributes among CTLs programs are "STEM Content" and "Instruction," as indicated by the six members completing the rubric.

- Based on the rubric findings from six members of CTL, the two attributes that have the most potential for future growth are "Career Connection" and "Professional Development."

- The ratings of the remaining four attributes were mixed and tended to hover around the developing category.

Next Steps

The results from the STEM Equity Program Evaluation Rubric will inform members of the Center for Teaching and Learning how well their programs meet the standards of equity in STEM education and guide their team to design strategies to grow toward "accomplished" in each of the eight attributes.

Findings

Equity Focus

Clearly stated equity in STEM mission and vision, need statement, and history of positive outcomes that explicitly impact underrepresented groups.
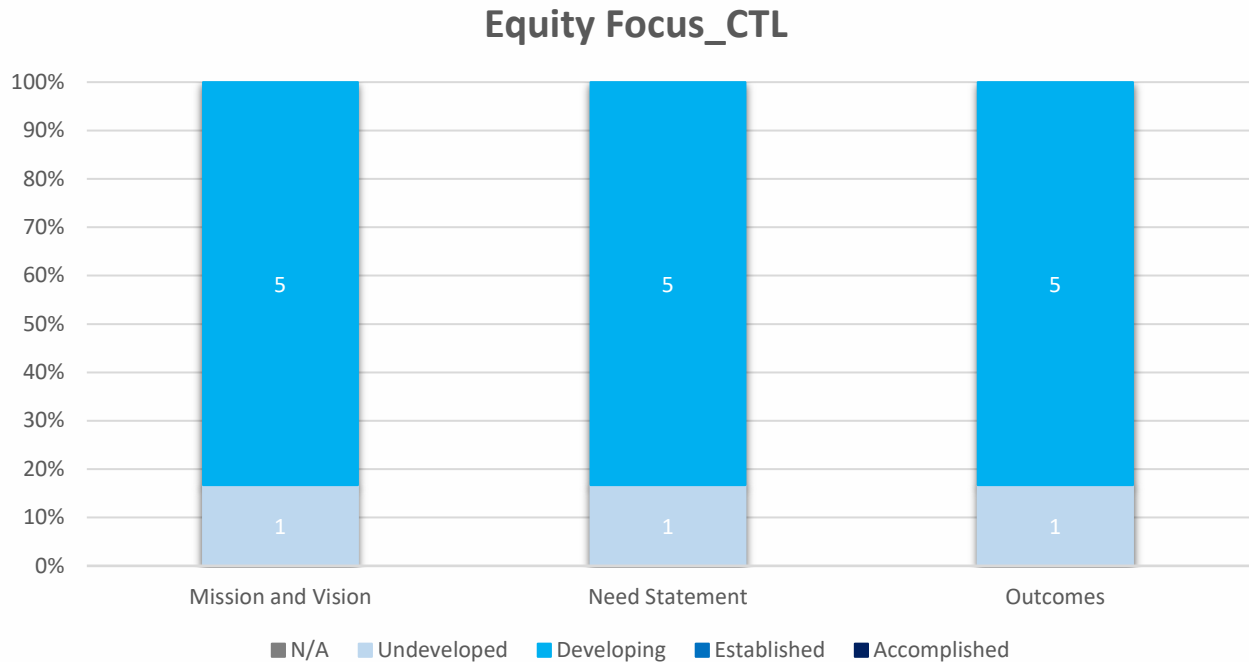
Equity Focus_CTL

- A majority of the CTL members completing the rubric felt that they are currently developing in all subareas of Equity Focus.
  - Developing "Mission and Vision" – Equity focus is offered within the system and incorporated in some strategies with inconsistent review for improvement.

  - Developing "Need Statement" – Equity focus of the target population is identified and needs are not validated through analysis.

  - Developing "Outcomes Impact Targeted Underrepresented Groups" – Equity focus reflects unexpected outcomes when an intervention is applied.

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Capacity

Capacity to be sustainable, replicable, and scalable with diverse students in diverse communities.
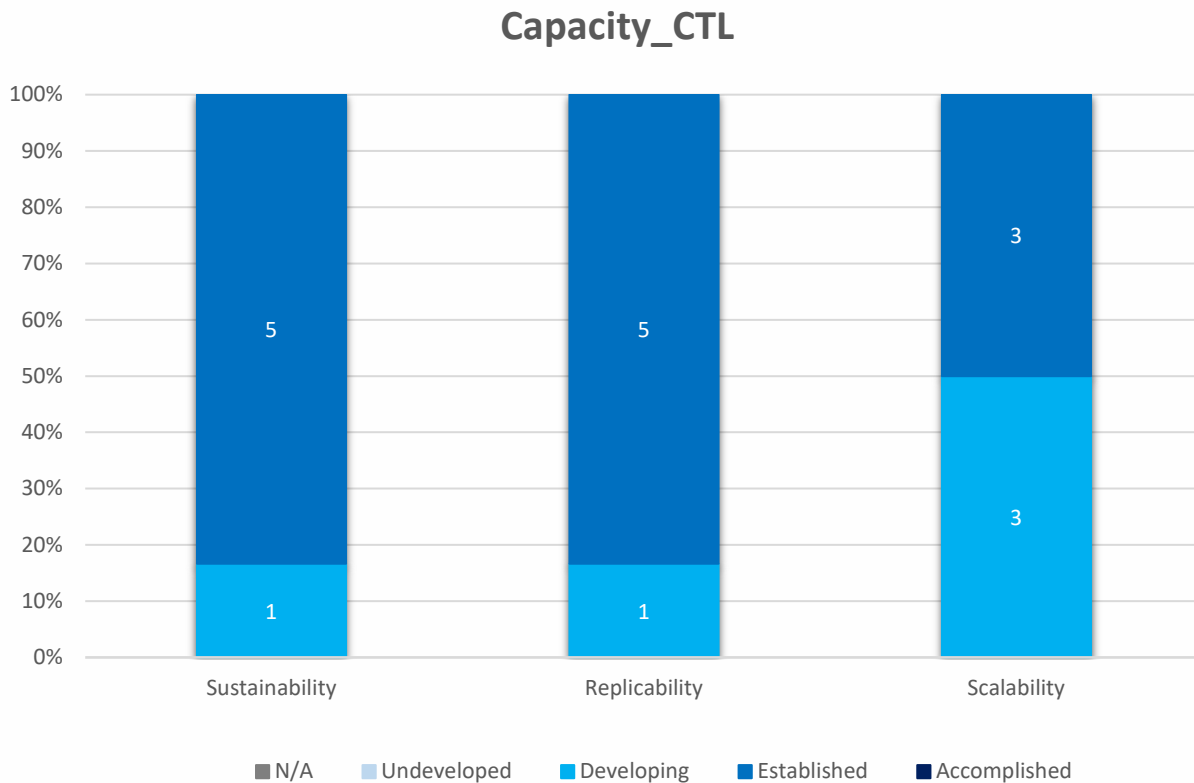
Capacity_CTL

- Many of the CTL members completing the rubric agreed that they are established in the subareas of "sustainability" and "replicability."
  - Established "Sustainability" – Program has a steady source of income from an external source and has some internal revenue generating capacity.

  - Established "Replicability" – Program has the potential to be replicated and has some support for those wanting to implement. Fidelity of implementation is unproven especially in diverse communities.

- For the subarea of "scalability", the members of CTL were split evenly between developing and established.
  - Developing "Scalability" – A process for scaling the program is offered but it is not well documented.

  - Established "Scalability" – Most elements of the program are well documented and some tools and resources are available at a low cost.

Career Connection

Students are connected to their future college and career goals and engage with business, industry who provide diverse STEM role models and work-based learning opportunities.

Career Connection_CTL
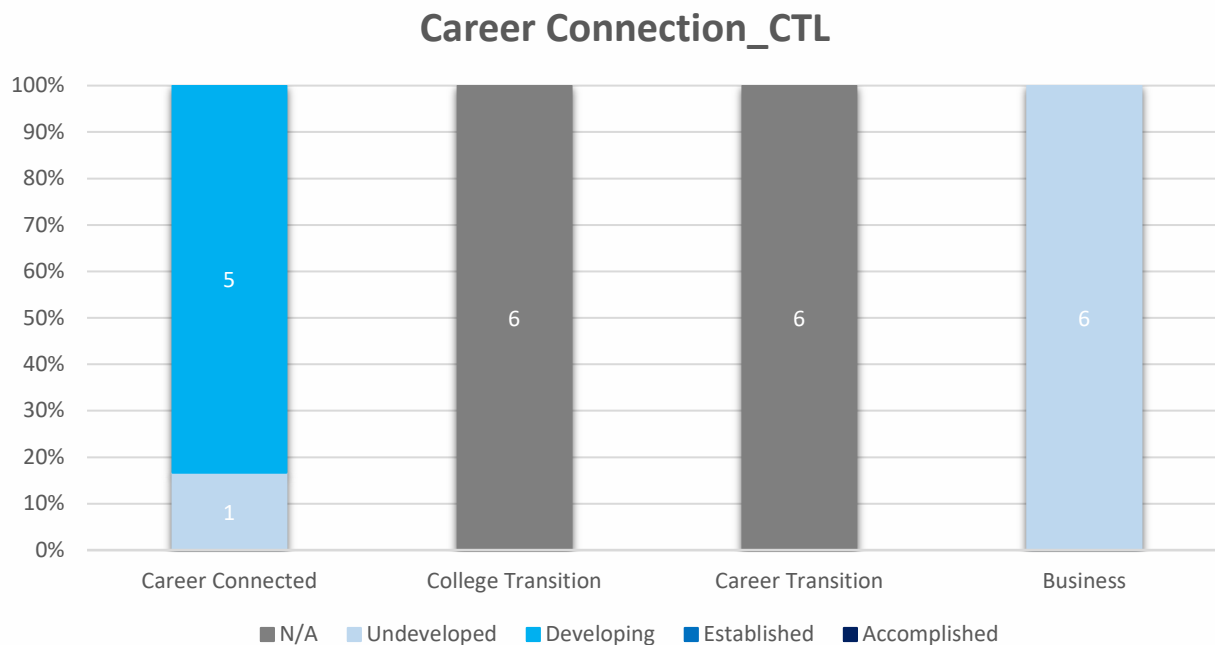
- A large majority of the CTL members completing the rubric felt that they are developing in the subarea of "career connected learning."
  - Developing "Career Connected Learning" – Student learning is linked to STEM careers during special events or STEM career days. Career connections often make mention of underrepresented groups in STEM careers but profiles lack depth or mainly focus on examples from traditional groups. Teachers understand and explain that people from all backgrounds succeed in each industry. School staff make information about STEM education pathways to careers available.

- It was reported that the areas of "college transition" and "career transition" were not applicable for the programs of CTL.

- The members of CTL unanimously indicated that they are undeveloped in the subarea of "business, industry engagement."
  - Undeveloped "Business, Industry Engagement" – The business and industry engagement plan is not equity focused. The school does not provide opportunities for students to interact with diverse role models. Showcasing diversity in STEM is not a focus of the school's work-based learning program and not a factor in employer recruitment or student placement.

STEM Content

Challenging and relevant STEM content aligned with standards, integrated in the formal curriculum, accessible by diverse students and leads to college and career transition in STEM.

STEM Content_CTL
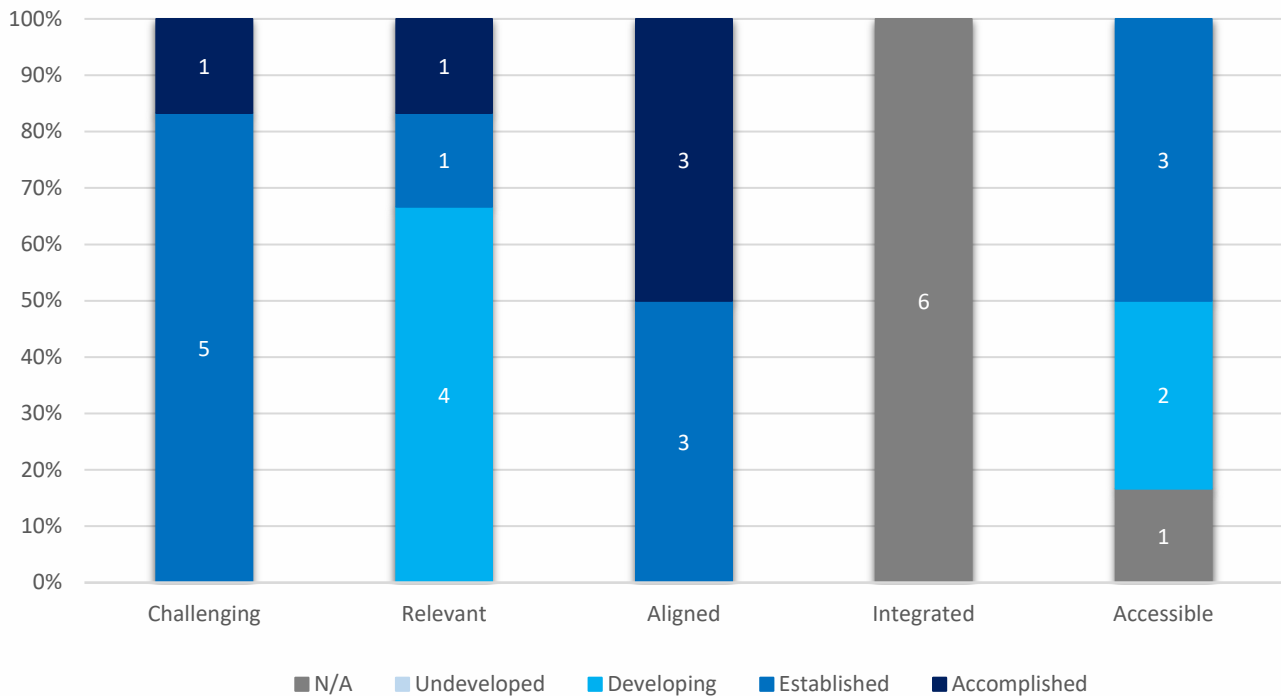
- A large majority of CTL members completing the rubric agreed that they are established in the subarea of "challenging STEM content."
  - o Established "Challenging STEM Content" – STEM content is rigorous for all students with varied differentiation of pathways to pursue STEM learning.

- Some members of CTL felt that the program is still developing in the subarea of "relevant STEM content." Two other members felt that the program's relevant STEM content was either established or accomplished.
  - o Developing "Relevant STEM Content" – STEM content is the same for most students with some cultural relevance used inconsistently across levels."

- With regard to STEM content that is "aligned with standards," the members of CTL were split evenly between established and accomplished.
  - o Established "Aligned with Standards" – Program-wide efforts are being made to align all STEM content with state and federal standards with inconsistent implementation. Equity gaps in assessments exist for some student groups.

  - o Accomplished "Aligned with Standards" – STEM content is aligned with state and federal standards that support rigorous and comprehensive knowledge and skill development as shown by no equity gaps in student performance on state assessments.

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- All members of CTL reported that the subarea of "integrated in the formal curriculum" was not applicable for their programs.

- Members of CTL completing the rubric indicated that "accessible" STEM content is still developing, while others indicated that it is established. One member felt that this subarea was not applicable to the CTL programs.
  - Developing "Accessible" – Upper level STEM courses are inconsistently available. Algebra 1 is available in the 8th grade only. STEM related CTE pathways are limited at the middle and high school level. Few modifications or support services are available for special population students.

  - Established "Accessible" – Upper level STEM courses are available in most high schools and Algebra 1 is available in most middle schools at the 7th and 8th grade. Some student access certifications, endorsements, examinations, and licensures with few supports from the program/school. Modifications and limited support services are available for special population students.

Instruction

STEM instruction that integrates technology, utilizes multiple instructional strategies that are culturally relevant, experiential, results in the closing of equity gaps and inspires students to pursue more STEM course work or careers in STEM.
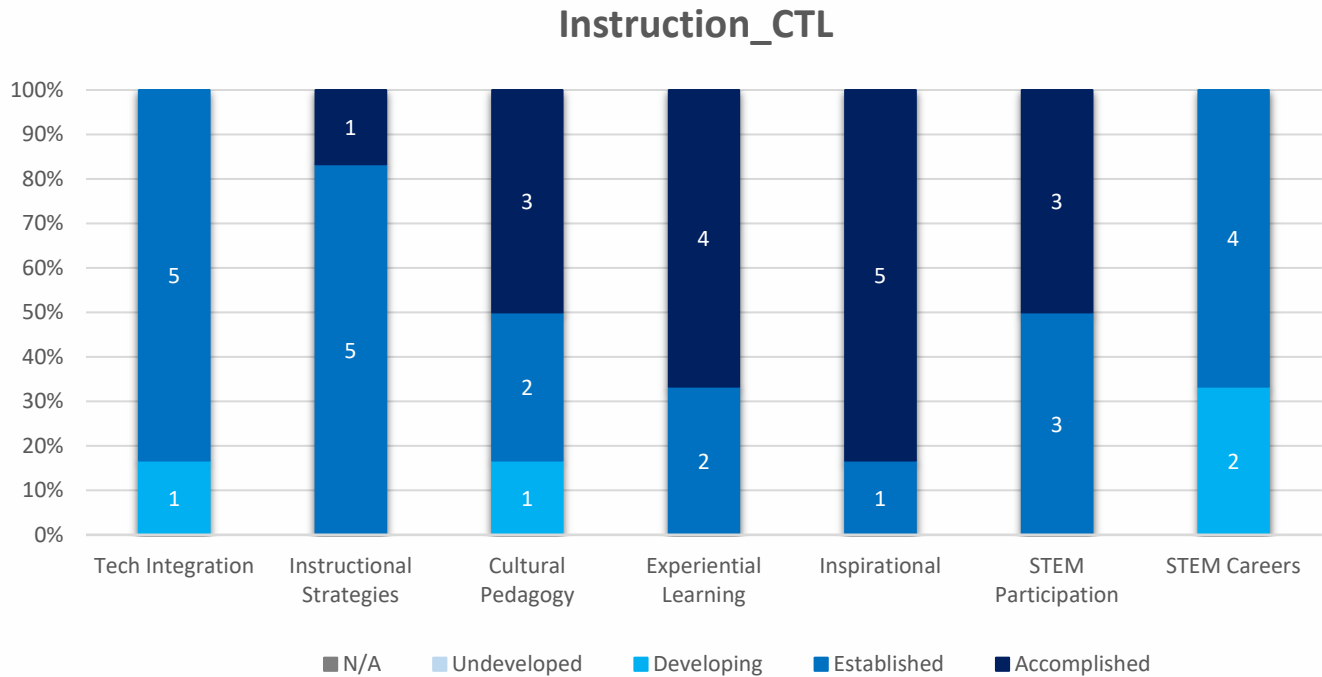
Instruction_CTL

- A majority of the CTL members completing the rubric agreed that their programs are established in the subareas of "technology integration" and "instructional strategies."
  - Established "Technology Integration" – Instruction includes some access to devices, broadband, and teachers who are qualified to facilitate technical opportunities to meet the diverse needs of students.

  - Established "Instructional Strategies" – Instruction mostly supports meaningful learning that includes critical thinking, problem solving, and higher-order exercises. Instruction utilizes some differentiation techniques to meet the needs of groups of diverse learners.

- For the STEM instruction subarea of "culturally relevant pedagogy," CTL members indicated a mix of responses ranging from developing to accomplished.
  - Developing "Culturally Relevant Pedagogy" – Instruction focuses pedagogy to support academic achievement (learning and rigor) and does not build on the students' prior learning.

  - Established "Culturally Relevant Pedagogy" – Instruction often focuses pedagogy to support academic achievement (learning and rigor) expectations which build on the students' prior learning.

  - Accomplished "Culturally Relevant Pedagogy" – Instruction focuses pedagogy to support academic achievement (learning and rigor) expectations which build on the students' prior learning.

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- Responses for the subareas of "experiential learning" and "inspirational and innovative" were similar as most CTL members agreed that these subareas are accomplished, with some CTL members indicating that these subareas are established.
  - Established "Experiential Learning" – Students apply learning through meaningful experiences.

  - Accomplished "Experiential Learning" – Students critically construct knowledge and apply learning through meaningful experiences.

  - Established "Inspirational and Innovative" – Instruction encourages student creativity and innovation.

  - Accomplished "Inspirational and Innovative" – Instruction encourages students to create new and imaginative solutions to problem solving that inspires them to want to learn more in STEM.

- The members of CTL were split evenly between established and accomplished for the subarea of "STEM course participation."
  - Established "STEM Course Participation" – Instruction prepares students to test solutions and recognize learning potential.

  - Accomplished "STEM Course Participation" – Instruction prepares students to develop new strategies to leverage and apply analytical learning through testing solutions.

- In the subarea of "STEM majors and career trajectory," CTL members were divided among the categories of developing and established.
  - Developing "STEM Majors and Career Trajectory" – Instruction includes limited introduction to what is required in a STEM major or career.

  - Established "STEM Majors and Career Trajectory" – Instruction introduces students to diverse STEM careers and provides information about what is needed to pursue further education in a STEM major.

Professional Development

Integrated and inclusive professional development that ensures faculty and staff STEM proficiency and equity, implicit bias, and cultural competency in program design and pedagogy.

Professional Development_CTL
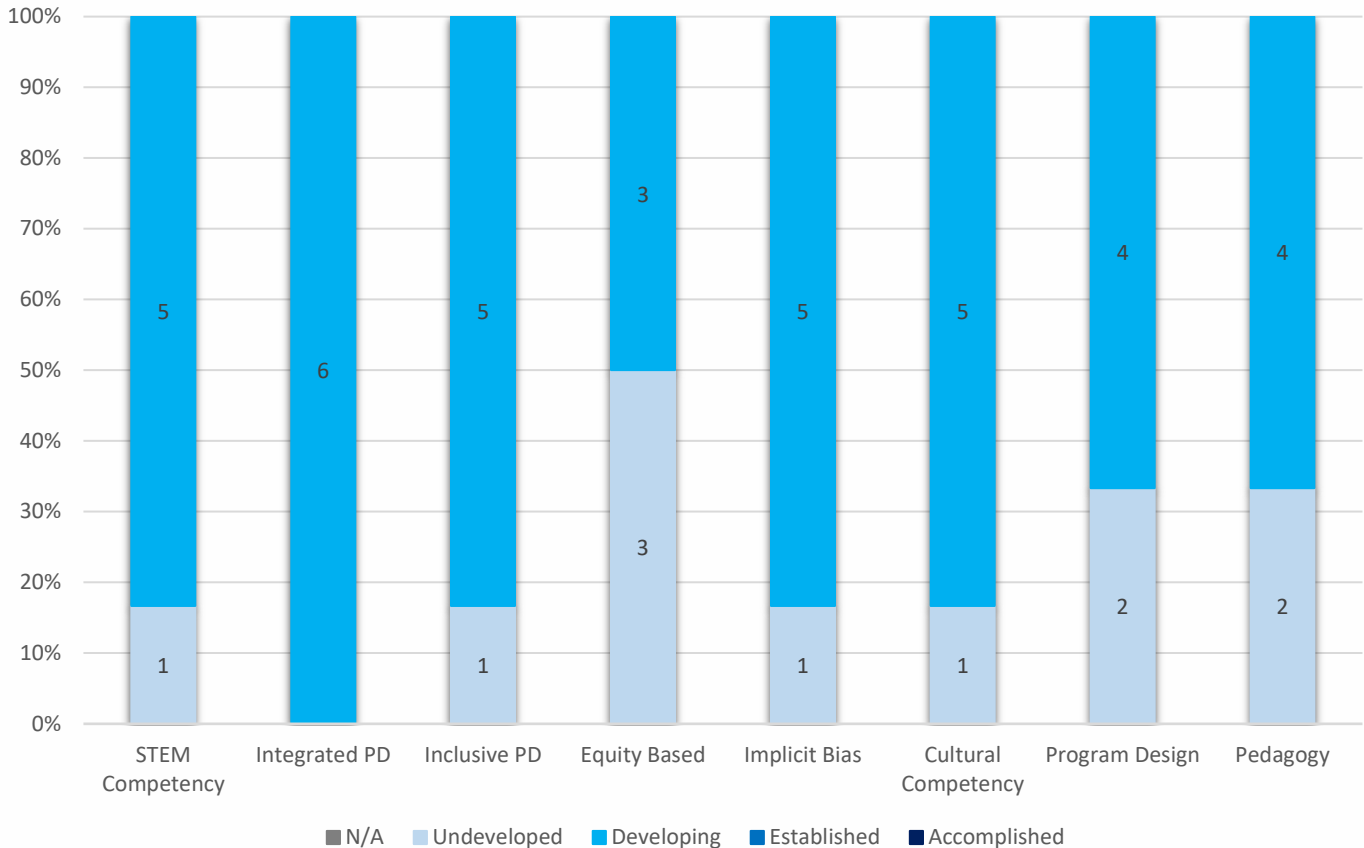
- A majority of the CTL members completing the rubric felt that the subareas of "STEM content competency" and "inclusive professional development" were developing within their programs, with one member reporting that these subareas were undeveloped.
  - Developing "STEM Content Competency" – PD on STEM content proficiency is offered occasionally for some faculty and staff and some STEM faculty participate.

  - Developing "Inclusive Professional Development" – Some PD includes a focus on inclusive practices to address diverse learners but is not available to all faculty and staff.

- The members of CTL unanimously reported that they are developing in the subarea of "integrated professional development."
  - Developing "Integrated Professional Development" – PD on equity and inclusion strategies is available as a separate PD offering only.

- In the subarea of "equity-based training", the members of CTL were split evenly between undeveloped and developing.
  - Undeveloped "Equity-based Training" – PD on strategies to engage underrepresented groups in STEM is not available or supported.

  - Developing "Equity-based Training" – Some PD on strategies to engage underrepresented groups in STEM is offered but not available to all faculty and staff.

- Many of the CTL members completing the rubric agreed that they are developing in the subareas of "implicit bias training" and "cultural competency training," with one member indicating that these subareas are undeveloped.
  - Developing "Implicit Bias Training" – Some PD on implicit bias is available but it is cursory and not available to all faculty and staff. Programs have not been reviewed for bias.

  - Developing "Cultural Competency Training" – Some PD on cultural competency is available but it is cursory and not available to all faculty and staff. Programs have not been reviewed for cultural relevance.

- Responses for the subareas of "program design" and "pedagogy" were similar as most CTL members agreed that these subareas are developing, with some CTL members indicating that these subareas are undeveloped.
  - Undeveloped "Program Design" – PD is not available or supported by the organization.

  - Developing "Program Design" – PD on STEM equity is only available to certain faculty and staff and is available in only one delivery method.

  - Undeveloped "Pedagogy" – PD is not available on equitable instructional strategies and activity design.

  - Developing "Pedagogy" – PD on equitable pedagogy is only available to certain faculty and staff with no evaluation of its implementation or impact.

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Leadership

Commitment from organization top leadership reflected by program visibility, staff engagement, student engagement, financial investment, and systemic integration.
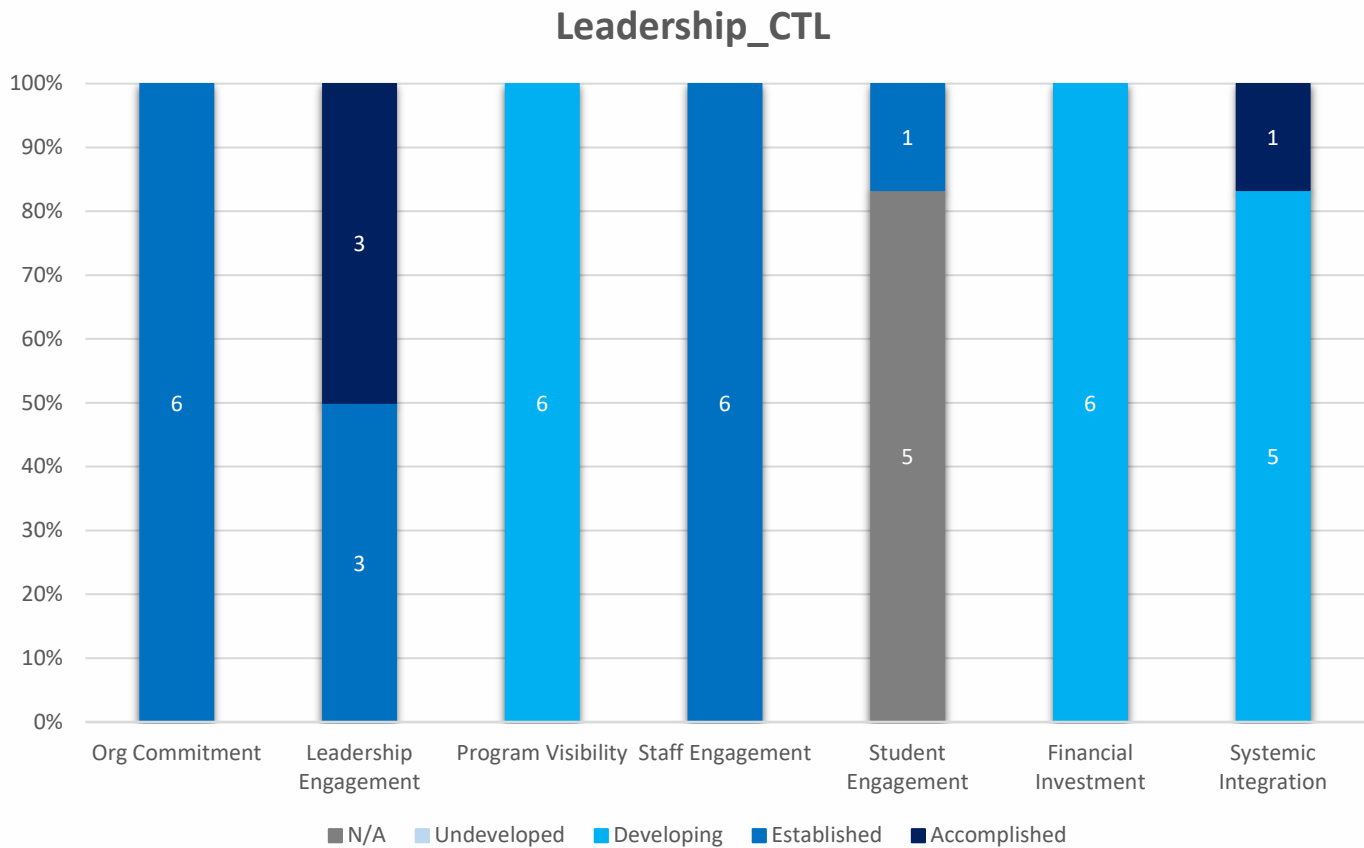

Leadership_CTL

- The members of CTL completing the rubric unanimously reported that they are established in the leadership subareas of "organizational commitment" and "staff engagement."
  - Established "Organizational Commitment" – The organization explicitly promotes equity as an organizational priority and has operationalized it in some of its programs.

  - Established "Staff Engagement" – All staff participate in equity initiatives and are learning about equity in STEM education research. Some staff are knowledgeable of equity in STEM education research.

- For the subarea of "leadership engagement," the members of CTL were split evenly between the categories of established and accomplished.
  - Established "Leadership Engagement" – Organization leadership reflects diversity and some demonstrate commitment to equity by engaging in equity-related activities.

  - Accomplished "Leadership Engagement" – Organization leadership reflects diversity, demonstrates commitment to equity, and engages in specific equity-related activities.

- All CTL members completing the rubric agreed that they are still developing in the leadership subareas of "program visibility" and "financial investment."
    - Developing "Program Visibility" – Program is not well known in diverse communities due to the use of traditional outreach methods. Media outreach materials promote diverse participation.

    - Developing "Financial Investment" – The organization has created a separate budget priority for equity initiatives and professional development that supports the organization's limited equity agenda.

- A majority of the CTL members completing the rubric felt that the leadership subarea of "student engagement" was not applicable for CTL programs, while one member felt that this subarea was established.

- In the leadership subarea of "systemic integration," a large majority of the CTL members indicated that the CTL programs are developing, with one member indicating that this subarea was accomplished.
    - Developing "Systemic Integration" – Organization staff is not diverse. Equity is part of all planning processes and organizational evaluation efforts; however, the results of these efforts are not always implemented.

Community

Authentic community and family engagement of the target population being served.
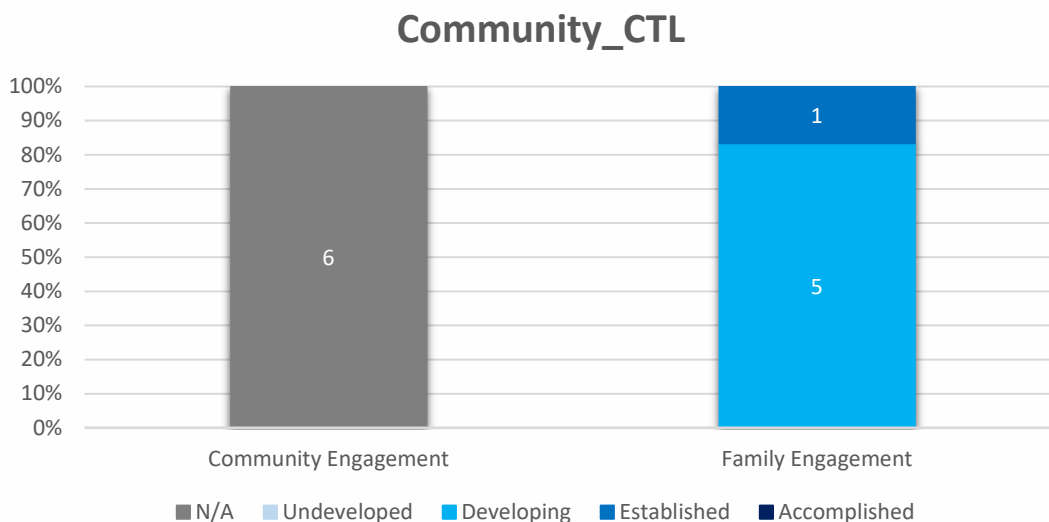
Community_CTL

- The members of CTL completing the rubric unanimously reported that the community subarea of "community engagement" was not applicable for their programs.

- A large majority of the CTL members completing the rubric felt that the community subarea of "family engagement" is developing, while one member felt that this subarea was established.
    - Developing "Family Engagement" – The school uses multiple means to transmit information to families. Information generally travels one-way. Families are aware their children do "STEM" at school, but may not know what it means. Some families attend school-wide "STEM nights" at the school.

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