

English Language Learners and a Home-grown STEM Workforce: Teacher Education, Effective Instruction, and Student Learning

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Preparing Teachers OF STEM FOR ELLs: The Challenge of “Best Practices”

Variations to consider:

- Pre-service teacher preparation vs. in-service teacher professional development
- Longstanding ELL populations vs. large numbers of newcomers
- Elementary vs. secondary education
- Policy context regarding ELL placement and linguistic and cultural support

One size doesn't fit all – but there are still some useful recommendations.



Focus On Robust STEM Inquiry

In teacher education:

- Multiple inquiry models, not one “scientific method”
- Inquiry as more than hands-on
- Inquiry using actual standards/ curriculum

As instructional strategies:

- Integration of inquiry goals and content goals
- Frequent connections to real-world life and work skills and to on-going academics

To support ELLs' learning:

- Inquiry used to support ongoing, interdisciplinary academic engagement
- Inquiry that supports multimodal communication skills



Focus On Academic Language Development

In teacher education:

- Increased focus on content area language (all 6 language arts)
- Theory and practice of 1st and 2nd language acquisition for all content area teachers

As instructional strategies:

- Explicit language goals as part of all STEM lessons
- Focus on academic vocabulary – increased emphasis on type 2 vocabulary
- Focus on academic language of STEM – characteristics such as abstract, depersonalized, and dense language

To support ELLs' learning:

- Availability of multilingual resources
- Wide range of techniques to assess communication skills and academic learning



Focus On Coordinating Multiple Resources

In teacher education:

- **STEM education as a team effort – strategies for partnership building**
- **Connection of pre-service and in-service teacher education**

As instructional strategies:

- **Explicit focus on opportunities in the STEM workforce – school-college and school-business partnerships**
- **Community and family funds of knowledge – school-community partnerships**

To support ELLs' learning:

- **Teachers engage with students beyond the STEM class period**
- **Students work on extended projects for authentic purposes and audiences**



Take Home Message

How best to support a home-grown STEM workforce that includes ELLs?

- **Focus on robust science inquiry, academic language development, and coordination of multiple resources**
- **All of these help teachers focus on how students think and learn**
- **All of these help students see the value of STEM learning and careers**
- **All of these help link teacher education, effective instructional practices, and student learning**

