

Durable STEM education programs: Evidence from diverse fields

Summary of literature review

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The challenge:

Address a gap in understanding of what factors could help STEM education programs sustain their impact and be more durable over time.

The review:

- analysed 25 studies from diverse fields: education, environment, health, social science & sustainability
- focused on specific projects or programs where the approach is relevant to STEM education
- identified **248 factors** that influence program durability, **simplified into 10 categories across three major themes**
- used a weighted scoring system to assess evidence quality, ranging from durability factor mentions in discussions/documents to peer-reviewed evidence.

Categorisation of program durability factors:

Theme: Program dynamics



Program design & implementation

Factors relating to the planning & execution of a plan to create a robust foundation & adaptable framework for long-term success.



Monitoring, evaluation & learning

Implementing processes to track progress, assess results, & apply learnings to improve program performance/durability.



Adaptability & responsiveness

Adjusting to changing conditions & respond to new challenges/opportunities in a way that maintains relevance & effectiveness.

Theme: Community & resource dimensions



Financial & resource management

Mentions of the efficient & effective use of financial resources/other assets to support program objectives & long-term viability.



Stakeholder engagement & partnerships

Key individuals/organisations with an interest in the program and/or mentions of fostering collaboration & support.



Community & societal factors

The program's societal and cultural context, including community needs, values, & behaviours that influence program durability.

Theme: Program dynamics



Leadership & governance

References to the role of leaders/governing bodies in guiding the program, ensuring accountability, & making decisions to promote durability.



Organisational capacity

The internal capabilities of an organisation, including staff skills, management systems & physical infrastructure, which support durability.



Privacy & legislative support

The program's alignment with relevant policies & legislation that provide a supportive framework for its ongoing activities.



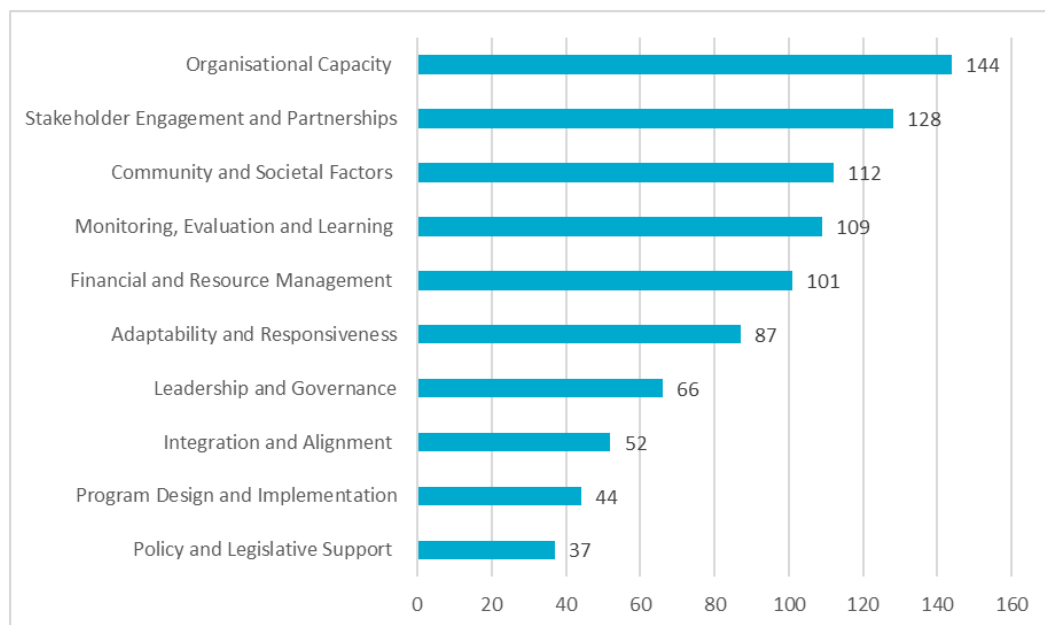
Integration & alignment

Integrating program activities/goals with other initiatives, aligned with broader strategic objectives to create synergies/enhance durability.

Evidence weightings:

Using the evidence scoring system and the 248 factors, the 10 categories were assessed for their evidence weighting. Organisational capacity, stakeholder engagement and partnerships, and community and societal factors were the most highly weighted.

This should not diminish the potential significance of factors with lower evidence scores. Their apparent lesser importance may reflect an underrepresentation in the literature or measurement challenges, not lack of impact.



Program durability categories ranked by strength weighting, which is a sum of the scores given to each factor mentioned in each publication.

Conclusion:

- The potential durability of STEM education programs is not influenced by a single element.
- Long-term success hinges on a complex interplay of factors, including organisational capacity, stakeholder engagement, and adaptability.
- STEM education programs should consider creating a strategic, clear vision with durability and scalability in mind. This should be supported by long-term planning, monitoring, and evaluation.
- Inclusive and collaborative structures that foster partnerships at various levels are important. As is establishing strategic foundations that align the program's vision and values with organisational and community needs. Effective leadership and program champions are key to this success.
- The durability of STEM education programs is critically important. The review calls for an even broader understanding of how programs can apply insights from other fields for greater durability, impact and sustainability.

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