What are promising scale-up strategies for DRK-12 projects?

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Purpose of This Session

- For today's session, scaling up means having many users
- Andy and Susan Courey presented a session about scaling up in 2012
- The SmartGraphs project has grappled with scaling up since 2012
- We want to hear from you: your experiences and ideas about scaling up

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SmartGraphs

Today's Agenda

1. Introductions: Who is here and why?
2. Experience of the SmartGraphs project
3. Review of NSF product types
4. Quick review of nine big ideas for scaling up
5. Sharing of other Scale Up strategies

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SmartGraphs: 'Normal' Dissemination

- Website – smartgraphs.org (includes activities, research results)
- Conferences - NCTM, iNACOL, NSTA, ISTE, BLC, NARST, AERA
- Newsletter articles – featured cover page
- Peer-reviewed article - *Journal of Science Education and Technology*

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SmartGraphs Scaling Up Attempts

- Business plan – Studied the 'Freemium' model
- SmartGraphs - tri-fold
- Competition – Teacher storyboard/authoring
- Discussions with publishers – Discovery Education, HMH, and Pearson
- App for iPad and Android tablets

  ~ free Biology app

  ~ 19 Algebra activities app - $0.99/download

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Product Types

Product Type	Description	Examples	Measures of scale	Comments
1. Commercial curricular product	Distributed by a for-profit partner	Connected Mathematics; Geometer's Sketchpad	Sales, market share	For-profit provides an income stream for marketing, updating, etc. However, the market does not always respond positively even to the best innovations.
2. Free curricular product	Distribution via Internet or other "free" access	PhET; Nat'l Library of Virtual Manipulatives	Quantity distributed (e.g., number of downloads), no. of users	Free is an appealing price to end-users! Rapid scale up can happen (e.g. PhET). However, sustainability is an issue, and PD may be lacking. Income stream often absent.
3. Research (knowledge)	Findings and/or data from research	Wait time I and II; NAEP; TIMSS; uses of student misconceptions	Frequency of use (e.g., no. of citations), importance to policy makers	Use of knowledge by practitioners may or may not correlate with volume of citations in the research literature.
4. Models and practices	Powerful ideas that spread, with or without obvious attribution	Development and use of probes & sensors for science education (R. Tinker's work)	Spread of idea to practitioners (e.g. percent of teachers or schools)	"Inside knowledge" may be needed to trace the influence of particular models and practices back to their sources.
5. Support tools	Scales, instruments, and other products used for STEM R&D, assessment, etc.	RTOP observation protocol; force concept inventory	Numbers of users; importance of uses; influence on next set of tools	Although not as visible to the public as curricula, tools are essential for progress in the R&D field.
6. Standards, issue briefs, policy doc's	Documents intended to guide practice	Project 2061 Benchmarks; NSES; AERA Research Points	Copies distributed; knowledge among policymakers	Although little research or evaluation about the impact of these documents is supported, they may be very influential.

Nine Big Ideas

1. For today's purposes, scaling up means having many users
2. NSF funds multiple types of projects, so scale-up measures vary
3. Most NSF grantees do not choose to, and are not funded to, scale up
4. Scaling up requires understanding one's "customers"
5. Scaling up requires business mindset: marketing, revenue, support, etc.
6. Rogers says five criteria increase potential for "diffusion"
7. The "value proposition" for the innovation is one key to scaling up
8. There are multiple approaches to scaling up
9. Approaches and goals of the host organization and of the innovation itself should be aligned

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How do you Scale Up?

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Big Idea #6

Rogers says five characteristics increase potential for "diffusion"

1. The relative advantage of the innovation compared to existing products or practices
2. Compatibility with people/environment where used
3. Complexity of the innovation (inverse relationship)
4. "Trialability"
5. "Observability"
6. *Capacity for re-invention (to local circumstances)*

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* Source: Rogers, E.M. (2003). *Diffusion of innovations* (Fifth edition). NY: Free Press.

References

SmartGraphs: www.concord.org/smartgraphs (be sure to look at all three "tabs")

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Carlson, C. R., & Wilmot, W. W. (2006). *Innovation: The five disciplines for creating what customers want*. New York: Crown Business.

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The End

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