

Localization of a Global Technology Entrepreneurship Challenge for Girls

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Abstract

Non-profit organizations are rising to the challenge of tackling global issues. However, the role and design of local, embedded chapters within international non-profits is not well understood. This article addresses that gap by examining localization of the Technovation Girls competition. Through a multi-case study, we identify adaptation processes used by local Technovation chapters to recontextualize the competition. We contribute a novel theoretical linkage between glocalization and design mechanisms. Scholars from both disciplines benefit from this integration: they are provided with new vocabulary and constructs to describe their respective phenomena. Managers of international non-profits can learn from an exemplar case of achieving global outcomes through local, specialized activities.

Introduction

Spanning geographical, cultural, and even institutional boundaries, global non-profits face unique and complex challenges. [Technovation](#), which hosts the world's largest technology entrepreneurship challenge for girls ("Technovation Girls"), is one such organization. Incorporated in the United States and operating in more than 50 countries worldwide, they run an annual design competition that empowers thousands of students to solve problems in their own communities. The objective of this research was to examine Technovation and its local chapters in order to (1) describe how these chapters localize the global competition process, and (2) describe localization processes using design constructs.

This research employed a multi-level embedded case study approach. The cases comprised six Technovation chapters (three in Canada, and three in Mexico). Data collection included interviews with key case stakeholders, direct observation and participation by the primary researcher at several Technovation Girls events, and a variety of archival sources.

The theoretical foundation for this research is *glocalization*, often presented as a counter-perspective to globalization; and *design rules*, a construct describing enforced parameters within a system's hierarchy. The comparative analysis conducted in this research sought to explain how the global non-profit maintains a degree of standardization while enabling local chapters to specialize the Technovation program. Thus our emphasis here was the *localization* portion of the glocalization cycle moving from global to local (i.e., construction of equivalency, and adaptation and enactment), rather than the portions of glocalization cycle moving from local to global (i.e., rebound, and abstraction through theorization).

The two major findings reported here from this research are as follows. First, the Technovation Girls program was adapted using 9 different processes. Second, the mechanisms underlying glocalization can be represented by the analogous principles of modularity and design rules. The remainder of this paper is organized in four sections. The literature review provides readers with a theoretical foundation. The methodology section describes our approach for conducting this research. The results section presents key findings, and the conclusion elaborates on the significance of the findings.

Literature Review

Glocalization

Globalization is “one of the most profound and sweeping processes of our time” [1], impacting how we work, think, and communicate. Scholars of globalization initially debated between its incessant compression of locality, and its unstoppable expansion of diversity. Roland Robertson introduced the term *glocalization* as a counter-perspective to this dichotomy. He argued that these two forces co-exist and impact one another. From a product development perspective, glocalization can be considered as “the tailoring and advertising of goods and services on a global or near-global basis to increasingly differentiated local and particular markets” [2]. For organizations, glocalization can be used as a strategic tool – building products that both cater to and can be customized by audiences around the world.

Glocalization can be characterized by three dimensions: *what*, *who*, and *how*. “What” concerns the item or subject of glocalization: “ideas, structure, and practices” [1]. In the organizational setting, this could be a strategy, policy, or managerial structure. The “who” are “agents of glocalization” [3] operating at the interface between the global and local. As mediating actors, they navigate the paradox of standardization and particularization to satisfy global and local stakeholders, respectively. These individuals enact the glocalization process by “[formulating] local distinctiveness in terms acceptable to global norms, and at the same time, help reorganize local cultural and political arrangements to be ... within the boundaries of proper global acceptability” [3]. Lastly, “how” refers to the underlying mechanisms. As a process, glocalization involves the travel of an item across the global-local dimension [1]. Through its journey, this item is subject to “translation, adaptation, re-contextualization, or otherwise modification” [1]. Re-contextualization implies that “items cannot be transported ‘wholesale’ from one cultural context to another. Instead, they have to pass through a powerful filter of local cultural and structural constraints to also gain legitimacy in their new local context” [4].

There are several processes that facilitate the re-contextualization of a global idea. Boxenbaum & Gond defined three “micro-strategies”. First is *filtering*, which “serves to eliminate ... features that may block the adoption of a foreign concept or business practice” [5]. Second, *reframing* “assigns a new rationale to a global concept” to align it with “local values and beliefs” [5]. Lastly, *bricolage* involves combining local practices with the “globalized concept to make it more useful, familiar, or legitimate” [5]. *Layering* is another re-contextualization method that superimposes “new structural or cultural elements and rules” on top of existing concepts [6].

Furthermore, from a strategic perspective, discursive tools such as *accounts* are used to “achieve fit between the ‘foreign’ and the ‘indigenous’” [4]. They develop a common frame of reference for actors to evaluate global ideas. Meyer describes different types of accounts that satisfy two objectives of glocalization: “mobilizing consent” and “neutralizing dissent”. Another tool that facilitates the translation of ideas is *storytelling*. This tool serves communication, knowledge sharing, and marketing purposes when applied in the organizational setting [7].

In the university ranking field setting, Pallas & Wedlin defined three processes of translation: *simplification*, as its name suggests, employs quantifiable information such as metrics to enable comparability and reduce complexity. *Standardization* involves creating a systemic set of information – typically inputs and outputs. In the university context, a standard system involves common measures which can be used to evaluate an institution. Lastly is *popularization*, which leverages standardization to “provide easily accessible and comprehensible hierarchical orderings” [8], thus increasing their potential for global adoption.

Negotiated legitimation helps organizational actors “exposed to a constant need for local sense-making under the condition of institutional ambiguity” justify their decisions [9]. Through discussion, “legitimation will be expressed, assigned, and possibly denied”, allowing actors to either compromise or agree on their implementation of a global concept.

Non-profit organizations and glocalization

In the face of global issues such as climate change, gender inequity, and pandemics, organizations outside of the private and public sectors are rising to the challenge – in particular, non-profit organizations and social enterprises. We focus this short literature overview on non-profits – the primary unit of analysis in this paper – and their purpose and place in globalization scholarship.

Non-profit organizations (NPOs) strive “to maximize utility” [10] in order to support “a given cause that is the target of all income” [11]. To achieve their social goals, NPOs rely heavily on individual volunteering, “a transfer of time and energy to the benefit of society” [11]. Partnerships with for-profit businesses, academic institutions, and government agencies are another vital source of time, energy, and even funding. Efficiently converting these precious resources into social impact is critical for NPOs.

Non-profits are both impacted by and have an impact on the international business landscape. For example, in their exploration of strategic issues facing NPOs in Australia, Jo Barraket states that “global restructuring of industries and rapid advances in information and communications technologies have placed pressure on some parts of the sector to professionalise, in order to maintain a viable presence among for-profit competitors” [12]. Conversely, Bahmani et al. showed that NPOs indirectly contribute to economic growth, through “entrepreneurship-investment and human capital” [10]. In the United States, NPOs “were responsible for 5.5 percent of the GDP” [13].

The study of NPOs and globalization highlights diffusion from the for-profit sector to the third sector. This diffusion, also termed “borrowing of practices”, occurs along the *horizontal*

dimension of glocalization [14]. However, for this article we focus on the *vertical dimension*, i.e. diffusion within an organization, whereby ideas traverse multiple, nested layers.

Design

Social, technical, and other complex systems are created through *design*. Design is the process of creating a form which aligns with its context or environment [15]. The alignment between context and form is also called *fitness*. A system has an *architecture*: the organization of its components to perform necessary functions. *Hierarchy* is an architectural property which yields a nested configuration of components [16]. When components are arranged independently of each other, the system is *modular* [17]. Components may also be referred to as modules. In a hierarchic system, modules may be visible or hidden. Visible modules, or *design rules*, are enforced design parameters, because they impose certain functional requirements on lower-level (hidden) modules.

Modular operators are actions that produce changes to the system design. Baldwin & Clark [17] define six operators. *Splitting* severs interdependency within a component by creating new sub-components, governed by design rules. This is the prerequisite step for all other operators. *Substituting* is the swapping of a module design for another and is mainly invoked for economic benefits. *Augmenting* is the addition of a new module to a design; meanwhile *excluding* is the removal of a module. *Inversion* occurs when an aspect of a design is taken from a lower level module and converted into a design rule, such that it now governs several modules. Lastly, *porting* is the translation of an existing module to another system, subject to different design rules.

Methodology

The objective of this paper is to explain the localization of a global non-profit organization by its regional chapters. Our research was conducted using the case study method described by Yin [18]. The case design was an embedded, multilevel study comprised of six cases (Technovation chapters) in Canada and Mexico. We selected these countries for theoretical replication, as their cultural and socioeconomic landscape varied significantly.

Data was collected over a four-month period by the primary researcher through participation in Technovation events, 26 interviews, and review of archival data for each of the six chapters (news articles, research papers, and social media postings). Using this data, case reports were developed to capture the key actors and components of each Technovation chapter.

Building upon previous work by Shaw [19], and Shaw & Muegge [20], we compare their Technovation process platform steps across each chapter to identify regional differences. Interviews with key informants revealed the adaptation methods that led to these differences. They were then traced to a corresponding glocalization process, if applicable. Finally, glocalization processes specified in the literature were compared against the modular operators to identify similarities or gaps in the underlying adaptation mechanisms.

Results

The localization of Technovation involved the three dimensions of what, who, and how. The subject of glocalization was the process platform. The 4-step process comprised of *recruitment, participation, competition, and engagement* was translated to the local chapters. Its

implementation varied based on local and national factors. For recruitment, chapters varied in terms of the target student demographic (e.g. public vs. private schools); the volunteer base (e.g. technology professionals vs. university students); and partnerships (e.g. community/volunteer organizations vs. tech companies). Participation involved execution of the program itself. Local chapters adapted the duration, workshop frequency and location, and sequencing of the curriculum lessons. For the competition phase, some chapters held pitch events with live judging, whereas others did not. Lastly, the engagement step was an optional feedback loop in which some chapters focused on retaining and building the community beyond a single season, through the Technovation alumni (student ambassador) program, for example.

Table 1. Localization processes applied to Technovation and their mapping to modular operators

Localization process	Examples within the Technovation context	Modular operator
Filtering	<ul style="list-style-type: none"> Many chapters removed elements of the curriculum (due to scheduling constraints, for example) 	Excluding
Layering	<ul style="list-style-type: none"> Calgary and Montréal: Added drop-in coding sessions on top of Technovation’s predefined workshop schedule 	Augmenting
Bricolage	<ul style="list-style-type: none"> Calgary: Incorporated the Technovation Girls program within an existing University infrastructure (i.e. with common resources, tools, and policies) Mérida: Incorporated the Technovation program within an existing organization, Women Who Code (i.e. combining curriculums and volunteer bases) 	-
Reframing	<ul style="list-style-type: none"> Calgary: Positioned the University as common ground for the Technovation program to reflect the city’s sense of unity 	-
Accounts	<ul style="list-style-type: none"> Mexico City: Leveraged a bridging account to promote learning English via the Technovation Girls curriculum 	-
Storytelling	<ul style="list-style-type: none"> Many chapters invited local entrepreneurs to share their experiences with participants, which anchored the curriculum in the “real world” 	-
-	<ul style="list-style-type: none"> Guadalajara: Imposed a local requirement where Technovation had not prescribed any detail: that male mentors be partnered with a female mentor 	Inversion
-	<ul style="list-style-type: none"> Ottawa: One partner organization leveraged the Technovation curriculum for other outreach programs 	Porting
-	<ul style="list-style-type: none"> Calgary: Replaced Thinkable/App Inventor with Java and Swift Montréal: Translated the curriculum to French Mexico: Translated the curriculum to Spanish 	Substituting

The agents of glocalization for Technovation were the global ambassador and regional ambassadors. The former is responsible for international growth and helps new chapters by connecting them with key stakeholders such as university deans, city mayors, and technology

companies. Because of their involvement early on in the chapter’s lifecycle, the global ambassador is often responsible for constructing equivalency – that is, creating a conceptual bridge between the global impact and purpose of Technovation, and the needs of the local community. They highlighted how this was carried out for the Montréal chapter:

That link with Silicon Valley was very important for her [Montréal regional ambassador] ... So the next time I went [to Montréal] during the pitch event ... I took my colleague from LinkedIn with me. And that really helped her cement the program. Because, I told you in the very beginning, it has to be a win-win in that very local environment. So for her to bring in people from Silicon Valley, for us to get a little bit of a, you know, media push, for her to be able to put it on the website really helped.

Meanwhile, the regional ambassador is responsible for managing the local program in its entirety. As such, they typically perform the “adoption and enactment” glocalization step. For Technovation, this involves making changes to the components of the platform process described above. In total, 9 different adaptation processes were identified, as shown in Table 1.

As can be seen in Table 1, at least two glocalization processes have an equivalent modular operator. Filtering and excluding both entail the removal of an element from the organization/system. Meanwhile layering and augmenting involve the addition of new elements. However, there are also gaps on either side – whereby an equivalent localization process or modular operator is not defined (per current literature).

Table 2. Linking between glocalization and design constructs

Dimension	Theoretical constructs	
	Glocalization	Design
What	Ideas, structures, practices	Modules
Who	Mediating agents	Module designers
How	Processes and mechanisms	Modular operators

In glocalization theory, an item or model is modified through adaptive processes. According to Baldwin & Clark, *modules* are “units in a larger system that are structurally independent of one another, but work together” (2000: p. 63). They are acted upon by *modular operators*, “actions that change existing structures into new structures” (p. 129), in the same way that glocalization processes modify an idea or concept as it travels from the global to local level. These changes are carried out by actors interfacing between both levels, just as a *module designer* “selects the design parameters of an artifact” (p. 33) to comply with interfaces specified by higher-level modules. The mapping between these constructs is shown in Table 2.

Conclusions and Implications

In this paper, we explored the localization of an international non-profit organization anchored by a technology entrepreneurship competition for girls. We developed an analytical model mapping the dimensions of glocalization – what, who, and how – to design constructs.

This novel perspective considers a localized entity as a module within a complex system. Through intentional modification, its form and function evolve. Ultimately, as with any design activity, the purpose of this adaptation is to achieve fitness between the local context (with unique cultural, socioeconomic, and environmental conditions) and the resultant organizational form.

We offer two primary avenues for future research. First is to further explore the localization of non-profit organizations. Particularly, identifying the factors that enable international growth and scaling of NPOs could be a highly practical contribution. Second is to build upon the linkage developed here between design and localization mechanisms. Examining the adaptation processes used by local entities may reveal new modular operators, which can then be borrowed by design scholarship.

Local chapters are the heart and soul of Technovation. They create tailored opportunities for young girls to interact with engineering and entrepreneurship in their local community, while simultaneously demonstrating the global impact of technology. To imbue deeper meaning into their respective organization, we encourage managers of non-profits to connect individual experiences with a broader shared purpose.

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