

# Engaging in self-study to support collaboration between two-year colleges and universities

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Physics faculty at three two-year colleges (TYCs) and a public, comprehensive four-year university (FYU) have been collaborating for over five years. The collaboration began with the implementation and refinement of novel instructional tools for use with diverse student populations and now includes a Learning Assistant program. To improve the collaboration, illuminate elements of TYC/FYU partnerships, and develop successful strategies for this type of collaboration, a qualitative self-study was conducted using a lens of structure and agency. The focus of this paper is the intersection between whether the partners are consumers or producers within the partnership and if the focus of the partnership is specific curricular products or the process of collaboration. The study has implications for methods of initiation and continued development of TYC/FYU partnerships.

## I. INTRODUCTION

Faculty at teaching intensive institutions, such as comprehensive universities and two-year colleges (TYCs) have experience in pedagogy and curriculum development, but often little time for researching student understanding. Faculty at these institutions often rely on student learning research and instructional materials from research universities where the populations are often quite different. It is therefore imperative for researchers to engage in education research at more diverse institutions such as non-traditional colleges and universities that serve underrepresented students [1,2]. Research collaborations between four year universities [FYU] and TYCs can have a profound effect on understanding and addressing the specific needs of diverse students [1,3]. This necessitates the development of partnership structures to allow collaboration and establish environments where faculty at these institutions can lead education reform efforts.

Research indicates that collaborations between TYCs and FYUs can have a positive impact on STEM students at TYCs and that faculty collaborations and learning communities can have a number of positive impacts on TYC faculty [4,5,6]. While the literature speaks to the structure of TYC/FYU science partnerships in the service of providing early science research experiences and facilitating student transfer from a TYC to a FYU, little attention has been paid to TYC/FYU collaborations that focus on curricula and pedagogy improvement [7,8]. This study illustrates the development and evolution of a collaboration between TYC and FYU science faculty centered on innovative curricula and classroom practices.

Over the course of the collaboration several conceptual tensions arose. The tension regarding the role of TYC faculty agentically choosing to be consumers or producers within the partnership and how that impacted their broader role within the science education community is explored.

Physics faculty at three public TYCs in Chicago, Harold Washington College (HWC), Olive Harvey College (OHC), and Malcolm X College (MXC), and a comprehensive, public FYU, Chicago State University (CSU) have been collaborating for over five years. All four schools are minority serving institutions (MSIs), with OHC, MXC, and CSU with majority African American populations and HWC with equal populations of African American and Hispanic students. All four schools serve commuter students and a high percentage of non-traditional students. The collaboration began with the implementation of novel instructional tools for introductory physics courses and then incorporated Learning Assistant (LA) programs in all four sites, where undergraduate students learn about pedagogy and assist faculty in classes to support student learning [9].

## II. RESEARCH DESIGN

To improve the collaboration and determine what structural elements may be transferable to other institutions and contexts, the partner faculty are engaged in an ongoing self-study [10]. The broad research question guiding this study is “How does a multi-institutional collaboration develop and evolve?” The goal of this study was not to reach generalizable conclusions, but to explore the development and evolution of this specific collaboration,

implications of which may inform how to create and sustain collaborations amongst other institutions [11].

A theoretical lens of structure and agency was used in this study [12]. Structures, which are the principles that pattern social action, are informed by schemas and resources. Schemas, or generalizable procedures, are ways of acting that can be used in a variety of locations and situations, while resources are actual human or nonhuman objects or attributes that can be used to enhance or maintain power [12]. Agency refers to an individual's ability to act within structures either consciously or unconsciously [12]. Structure influences an individual's agency in action or inaction, while at the same time individual agency can support or change the existing social structures. In this study participant agency is influenced in part by the structures of their individual departments and institutions as well as the broader contexts of academia.

In this study the bounded system being explored is the collaboration between CSU and the three TYCs [11]. Included in the case are the actions, interactions, relationships, projects, personnel, and resources that exist as a part of the collaboration. Only items that cross the institutional boundaries and the people that are engaged in cross-institutional talk are included with the recognition that larger contexts, such as institutional norms, will impact cross-institutional talk. Two physics instructors, Escudro and Millan were new faculty at HWC when they joined the collaboration. Physics instructor Zoller is at OHC and physics instructor Oladipo is at MXC. Physics education specialist Sabella and chemistry education specialist Van Duzor from CSU are also involved as is former Master of Arts in Teaching (MAT) student researcher Geiss. Physics teacher educator and administrator Cochran is external to the institutional collaboration and provides critical feedback to the partnership self-reflection. All participants have given permission for their names to be used.

In order to present an in-depth understanding of the collaboration in this study multiple sources of data were collected, including semi-structured interviews with all faculty partners and direct observations. Direct observations of outcomes, such as curriculum implementation and workshops, were used to support information from the semi-structured interviews and develop the timeline of interactions and projects that were a part of the collaboration. Codes were initially derived from the interviews based on points of contradiction and agreement between participants discussing the same events and ideas, such as the original purpose of the collaborative. Emergent patterns were then compared to the other data sources.

Data from the sites were analyzed and compared using the constant comparative method of qualitative coding [13]. Graphical connections of codes were made to visualize interactions between codes. To establish the credibility of the results, the researchers engaged in member checking where participants review the research findings [11,13]. All TYC faculty were asked if they would

like to contribute to the analysis and writing of this paper. Citing time constraints all declined, however Escudro and Millan provided editorial feedback.

### III. FINDINGS

Data analysis highlighted conceptual tensions in the development of the collaboration that provided opportunities for collaborative efforts to suffer or to grow. Four tensions emerged: (1) how partners balance flexibility and formality in instituting programs, (2) whether the partners are individuals or institutions, (3) if the partners are consumers or producers within the partnership, and (4) whether the focus of the partnership is on specific curricular products or the process of collaboration. The intersection of the latter two tensions is the focus of this paper.

#### A. TYC and FYU Faculty Roles in Partnership

The TYCs originally viewed themselves as consumers of professional development (PD) and material resources. This mirrors the common structure of PD where one group (in this case, CSU) with specific experience with a pedagogical resource or technique and access to educational research provides services and training for another group looking to make changes in their practice (in this case the TYCs). The PD centered on supporting use of new curricular materials at the TYCs and then introducing the Learning Assistant (LA) Model. When focused on curricula resources, TYC faculty typically casted themselves in the role of consumer. Escudro explained that when he and Millan first started teaching at HWC, they “hadn't had a lot of background in seeing what kind of new curricular materials were out there or thinking about lab equipment we would want to invest in. And so, Mel [Sabella] and the collaboration [were] very useful in that, you know, 'here are the materials we are using, and we think it would be a good fit for you'.” When Zoller originally joined the collaboration, he “definitely needed lab equipment,” and the original grant provided extensive lab and computer equipment “so it was a no brainer” to become a partner. The TYC partners felt that that the partnership fulfilled the goals of PD increasing pedagogical skills. Oladipo detailed that the PD was effective saying that the collaboration “has increased my reach for best practices...Inquiry teaching is something I've been able to bring into my teaching practice.”

When perceiving themselves as consumers in the collaboration, the TYC faculty were not passive in the collaboration. Escudro stated that he and Millan “were very motivated to try to do new things, and get ... outside expertise” precisely because they wanted to “shape the department.” As agents within structures of their department and academic science, they adopted and adapted resources, including curricula and programs, to better serve their students. Similarly, Zoller had a novel solution for

implementing the LA program when typical assignments could not be made due to course offerings. Instead he “came up with the idea of having them revise labs,” which is very different from the tenants in a typical LA program, but serves the goals of providing an introduction to teaching, and reflecting on teaching [9].

Based on schemas of power differentials between FYUs and TYCs, the TYCs instructors assumed that CSU was involved with the partnership as a means to have more attractive grant applications or, as Millan mentions, that it gives CSU an opportunity “to explore or to push doors into... different student populations that are covered by the different city colleges’ campuses” and “helps to show CSU they have a large range of influence in the region.” From the beginning, Sabella rejected the standard position in PD of the FYU as only the “provider” in the collaboration. He identified that a primary benefit of working with TYC instructors is that it “has really helped us have a decent sized group that is ... thinking about these same issues,” which does not fit the perceived producer/consumer structure. Initially, without an explicit discussion of roles, the TYC and FYU faculty perceived these roles differently.

As the partnership progressed, the perceived producer/consumer structure changed for the partners at HWC and MXC. Escuadro explains how the relationship between HWC and CSU changed over time: “We started this ... as one of the ... consumers of a lot of the curriculum. We would provide feedback on behalf of ourselves and our students ... we would partner with [instructors at the FYU], as opposed to more just kind of like a user.” The change in perception over time appears to be related to the partners’ belief in the goals of the partnership. As the partnership progressed with an emphasis on critical reflection and dissemination, the TYC partners became more aware of their potential contributions to the science education community. TYC faculty partners have attended several national and regional conferences and have been either lead or co-authors on six posters and presentations. This has helped them view the importance of their unique voices in informing the science education community around issues of diversity and helped them perceive themselves in the role of producers within the collaboration.

The TYC faculty perceptions changed from consumer to producer in the collaboration as they shifted their attention from impacting only their own classroom community to also informing the broader science education community. Oladipo explains his change in perspective: “I’d just, ‘ok, teach my class, do my work, off I go.’ It’s gotten me more active, to have a voice on how education should be run properly.” These changes in perspective illustrate changes in agency within the structure of the collaboration. However, taking a role as an agentic producer can be difficult for TYC faculty because of the structures within the institution. TYCs typically reward classroom improvement and assessment, but do not actively promote research and dissemination. Escuadro outlines the role he

would like to have stating, “I think it would be nice if our role was expanded not just as the laboratories of curriculum reform but partly being responsible for some of that curriculum reform. Like, taking the results that we get from our students and thinking about, well, how might these results be unique to our population and what can we do that’s specific to us to improve the state of physics education. I think that part of the difficulty of that is that scholarship isn’t part of our job description.” TYC instructors have taken a more active role in directing project goals to fit the structures of their own institutions and impact those structures. With the success of the LA Model, Escuadro, during a sabbatical with the support of his administration was able to institutionalize the program at HWC by drawing on their existing tutoring program. HWC has expanded the LA program to chemistry and is providing PD for faculty. Oladipo is in the process of proposing his own college supported LA program at MXC. In 2016, HWC and CSU co-hosted one of six regional LA workshops, with sessions at both campuses and joint planning with each other and the LA Alliance. This was the first multi-institution hosted LA Workshop.

## **B. Developing Agency through the Collaboration**

The goals of informing the broader science education community and sharing how curricular reform works in TYCs with diverse students transitioned some of the TYC faculty from operating as consumers of PD in the collaboration to producers of resources who disseminate locally, at their colleges, and nationally at conferences and workshops. The time constraints and reward structures that are in place for TYC faculty can make producing resources challenging, but the collaboration provided scaffolding through access to research, grants, and a push for dissemination. As the partnership evolved, CSU faculty were able to incorporate TYC curricular feedback into their own classrooms and disseminate results more broadly. Sabella noted, “people pay attention to those folks maybe a little more than when there’s a single talk from this two-year college or from Chicago State ... I think if we want our ideas to be heard by other people, we need a presence.” Joining voices in partnership helps the voice of institutions with diverse populations be heard more clearly within the structures of the broader academic community.

However, not all faculty changed their role from consumer to producer. Zoller is passionate about helping his students learn physics and actively seeks resources to improve his teaching, and his focus is on his own classroom. He describes his role in the collaboration, “I use it [physics curricula]. I add it to myself... a bit like a vampire. I’m not producing any physics education.” He has chosen to engage with the collaboration within the context of his own professional development, rather than as a partnership to inform the science education community.

### C. Creating sustainable partnerships

Self-analysis of the collaboration raises questions about sustainability of the partnership and how partnerships can be directed toward collaboration. With regards to consumer and producer roles, consciously recognizing these tensions may enable partners to agentially act to support the growth of the collaboration and the collaborative goals. Member checks with some of the partners surrounding transitions between consumer only to producer and consumer revealed that TYC and FYU instructors' perceptions of partnership roles did not align. Based primarily on time constraints, it is possible the TYC faculty members' focus on resource production may curtail involvement with projects directly related to the collaboration. For instance, Escudro and Millan are individually leading a workshop for HWC based on a prior workshop that they collaboratively led with Sabella and Van Duzor. Their increased expertise in resource production has made them less reliant on the collaborative. Alternatively, resource production may enhance TYC faculty members role in the collaboration as was seen in the joint regional LA workshop and the International LA workshop in which Escudro co-led sessions and engaged in the planning.

An additional issue around sustainability is the question of whether the partners are individuals or institutions. While not the focus of this paper, institutional structure plays a strong role in the individual's agentic choices to improve their classroom practice and/or share their voice with the science education community. There were questions as to how to leverage institutional connections while remaining a faculty driven partnership. Oladipo explained this dilemma: "There is not any formalized MOU [Memorandum of Understanding] so I can't really push ... a formalized MOU ... might get the college more committed to see success, to see it as one of their programs."

These responses suggest that, while success of the collaboration is dependent on individual connections and faculty choosing their roles within the partnership, the partnership cannot thrive without institutional support. Attempts at formalizing institutional connections are hindered by changing individuals at an administrative level,

faculty reward structures, and the reliance on granting agencies for monetary support. While the collaboration is strong now, if key individuals at the partner institutions leave, it may not be sustainable.

### IV. IMPLICATIONS

The implications of understanding this type of multi-institutional collaboration is essential in developing effective collaborations and fostering leadership roles from diverse institutions with unique experiences. It is important to provide space to have explicit discussions regarding roles early on in the collaboration. The building and strengthening of collaboration requires ongoing communication and understanding of individual and institutional structures that influence roles and agency. Intentional consideration of these structures and resources are necessary to allow for agentic movement within the collaboration. Consideration must also be given to efforts to sustain the collaboration in the face of changing priorities and faculty within the institutions.

The analysis raises questions for multi-site partnerships including: How do you simultaneously support effective collaboration at the personal and institutional level? How do you support collective practices between partners with perceived differences in power? Is it beneficial for some partners to start as consumers and move toward producers? Supporting instructional collaborations between TYCs and FYUs is of particular importance for MSIs, which can offer important perspectives on working with diverse students and which support a substantial transfer student population.

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