

## Contextualizing Perceptions of STEM Curriculum among Secondary Educators in Nepal

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### ABSTRACT

*Science, Technology, Engineering, Mathematics (STEM) education programs are currently being introduced and expanded across Nepal. However, a paucity of research has explored perceptions of STEM curriculum among educators – those who actually implement these programs. This study explores how Nepali secondary educators relate to and understand the STEM curriculum within the context of a U.S. funded STEM education program. Through analysis of interviews, focus groups, and observations at participating public schools in Pokhara, the paper considers how educators compare the STEM curriculum to Nepali curriculum and pedagogy. The study then aims to provide an initial contextualization of educator perceptions within the complex processes of development, class, and modernity in Nepal.*

**KEYWORDS:** STEM curriculum, secondary education in Nepal, globalization, pedagogy

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### INTRODUCTION

Science, Technology, Engineering, Mathematics (STEM) education programs are currently being introduced and expanded across Nepal. However, a dearth of research has explored the perceptions of STEM curriculum among educators themselves – those who actually implement these programs. Drawing on the literature of STEM research and the field of curriculum studies, this article explores how Nepali educators relate to the STEM curriculum. In particular, the paper considers how educators compare STEM to the government-sponsored curriculum and pedagogy in Nepal within the context of a U.S. funded STEM education program.

The paper begins with a brief history of STEM education before presenting a survey of the literature of STEM research in the Global North and South. Next, the paper describes the U.S. STEM program that took place in Nepal, situating it within the literature review from the field of curriculum studies. After presenting the study's methodology, the article moves to an analysis of empirical data collected at public schools in Pokhara. Finally, the study concludes with a discussion that aims to contextualize educator perceptions within the processes of development, class, and modernity in Nepal.

### A BRIEF HISTORY OF STEM EDUCATION

STEM education has its roots in the Industrial Revolution of Western societies. Before the United States was a nation, Benjamin Franklin called for a place to educate young minds in studies of the sciences and modern machines of the late 1740s. George Washington echoed the honor of early STEM education in his first address to the Congress in 1790. His call did not go without mention of national security (Washington, 1790). In fact, it may have

been due to scientific knowledge that the continental troops and its allies were able to defeat the Royal Navy in the Revolutionary War (Mackesy, 1964).

Until the turn of the 20<sup>th</sup> century, *technology* referred to the industrial arts like architecture, agriculture, and skilled crafts. At the turn of the 20<sup>th</sup> century, the newest trends in technology were viewed as the sum total of mechanical systems supporting a civilization (Nye, 2006). However, this new definition reframed the context of technology by excluding women from technology jobs and education. In the latter part of the 19<sup>th</sup> century, although women made some progress in the political realm, they were pushed out of higher education and industry. As the United States was entering into the industrial revolution, a gender gap kept women from equally participating as innovators.

In 1957, the Soviet Union launched the first artificial Earth satellite creating surprise, delight, fear, and jealousy around the world. Less than a year later, the National Aeronautics and Space Administration was created. This American desire for the integration of technology and the sciences, spurred on by the competition with the Soviet Union, has continued beyond the Cold War era. In the 1990s, the National Science Foundation (NSF) began to fund research projects that integrated the disciplines of science, math, engineering, and technology. To capture the integration, the NSF used a new term to encapsulate the new discipline called “SMET.” Judith Ramaley, the former assistant director for education at NSF, soon changed the acronym, in large part because she did not like the sound of “SMET.” Instead, “STEM” was a catchier name and shifted technology and engineering to the center. With “T” and “E” in the center, Ramaley emphasized the need to incorporate the disciplines between science and math as ways to interact with the universe (as cited in Cristenson, 2011).

The current state of STEM education has yielded repeated calls for further integration. Nevertheless, inequalities in STEM fields remain in the United States and around the world. According to the United States Department of Commerce Economics and Statistics Administration, in 2011, Hispanic and Black Americans made up 12%, with women at only 24%, of the STEM workforce in the United States (McKittrick et al., 2011). In recent years, there has been a push for women and under-represented minorities to enroll in college STEM programs, since that is the gateway to these types of careers. Addressing these inequalities is a major challenge for the burgeoning and popular educational approach in the coming years.

## **STEM RESEARCH IN THE GLOBAL NORTH**

STEM education in the United States and the Global North has developed steadily over the last 15 years. Educational research on STEM has attracted increased attention, leading to a flood of research within the past one to three years. Scholars initially sought to elucidate the very concept of STEM, first addressing the basic question, what is STEM education (Bybee, 2010)? Following these initial articulations, STEM research has fragmented into several different directions. Some scholars have concerned themselves with the development of a teacher workforce capable of teaching STEM (Gillespie, 2015; Aydin, 2015). Developing effective STEM professional development programs has recently become a new field in its own right (Avery et al., 2015). Still, others have focused on tying STEM programs and pedagogy to specific outcomes for students (Hudson et al., 2015). Exploring the links between pedagogical knowledge practices and student outcomes in STEM education has focused on teachers’ perceptions (Bell, 2016) and even enabled researchers to evaluate satisfaction with teaching on STEM vs. non-STEM programs (Pawson, 2012).

Student interest in STEM has been assessed in terms of exposure at younger ages (Kurz et al., 2014). This study sought to identify the impacts exposure to STEM at a young age can have on a student’s career choice. The study found that student perception and interest is not directly correlated. For the most part, students have a higher perception than interest in STEM. This may be due to pedagogical or curricular aspects, which make interest in STEM lower than it could be given student perception of the topics. Future iterations of

STEM programs could use this finding as motivation to raise interest in STEM given the pre-existing perception. Another study on student interest focuses on priorities and choices in STEM studies (Elster, 2014). This study, which reports findings from Germany and Austria, indicates that experiences in the secondary school and good teachers are important in choosing a STEM field of study. To prevent drop-outs, key factors are the relevance of the study choice for a student's own life, social and academic integration of STEM programs, and supportive mentoring systems.

### **STEM RESEARCH IN THE GLOBAL SOUTH**

Despite a rise in the prominence of STEM as an educational program, few studies have addressed STEM in developing nations. Perspectives on Australian, Indian, and Malaysian approaches to STEM education have been compared, revealing similarities and overlap due to the internationalization of STEM curriculum while highlighting national and local divergences (Thomas et al., 2015). The most prominent call in the literature on developing nations has been the call for more and higher quality STEM education. For example, the need has been identified to reform education policies in Turkey in accordance with the need to develop STEM knowledge and skills (Baran et al., 2016).

The most comprehensive study conducted in this category analyzes the need for an effective collaboration across STEM fields for meaningful technological development in Nigeria (Haruna, 2015). Haruna (2015) describes the need to facilitate collaboration across STEM fields in program development. This development is critical to providing a strong educational foundation to all learners in STEM education in Nigeria. The synergistic effort among educators and professionals across STEM fields aims to enable effective knowledge sharing in Nigerian STEM program development. The authors argue that leadership and knowledge sharing among collaborators in STEM program development, including collaboration across STEM fields, is crucial to Nigeria's success in STEM education. Beyond studies in Nigeria, a dearth of research has analyzed STEM in developing nations, let alone addressed issues of gender imbalance.

### **GIRLS GET STEM SKILLS (GGSS)**

This study explores the perceptions of educators in Nepal who participated in the Girls Get STEM Skills (GGSS) program. The GGSS program was funded through the U.S. Department of State for 2015/2016. The GGSS introduced girls aged 12-16 to an extracurricular program aimed at building confidence in foundational STEM skills. Empowering Women Nepal (EWN), a Nepali organization founded and run by Nepali women, implemented the GGSS. The 8-month program reached 254 girls and at three government schools in Pokhara, Nepal. The program provided 30 laptops (10 per school) for use at Navin Higher Secondary School, Janapriya Higher Secondary School, and Sheetaladevi Higher Secondary School. Teachers were paid 600 rupees an hour, equivalent to six U.S. dollars, and were also provided a typical afternoon snack each lesson, such as chow mien or samosas.

While many women's empowerment based programs focus on providing skill training to women already on the job market, the GGSS sought to take a more proactive approach that aimed to stop the problem before it started. The GGSS hoped to ensure that women's low representation in high skill jobs does not become an inter-generational deficit by fostering retention in schools at the primary education level and creating a new generation of young women prepared to lead in STEM fields.

The GGSS curriculum was adapted by the project team from an award winning STEM program for middle-school girls designed by the U.S. non-profit TechBridge. The team adapted the TechBridge curriculum to better fit the Nepali context. These changes included adjusting the resource type and quantities used in experiments, inserting names of

local geographical landmarks, and removing unnecessary technical words in English. The GGSS curriculum consisted of 20 lessons aimed at improving girls' skills in key areas of STEM. Lessons 1-16 focus exclusively on building STEM skills. Lessons 17-20 focus on building computer literacy. The curriculum was designed to best teach Nepali students skills deemed necessary for a rapidly globalizing world.

### **EDUCATION AND GLOBALIZATION**

It is essential that the GGSS program be understood in the context of the changes in education under globalization. In his article "Curriculum and Teaching Face Globalization," David Geoffrey-Smith (2009) argues that, in fact, there have been three forms of globalization. In Globalization One, the dominant form, he posits a revival of radical liberalism, or neoliberalism, reminiscent of Thatcher and Reagan's policies from the 1980s. In Globalization Two, Geoffrey-Smith documents the myriad ways in which people are accommodating or resisting Globalization One. In Globalization Three, he describes the conditions that are emerging for a new dialogue regarding sustainable human practices.

In his discussion of Globalization Three, Geoffrey-Smith (2009) addresses ways in which mutual understanding can be enhanced in the age of globalization through education. He explains, "successful study is oriented to peace [...] true learning means breaking the barriers and chains of ignorance and entering a new world in such a way that I and the Other become understood as One, as participating in a reality whose commonness transcends us" (p. 371). In this sense, the curriculum can become a multitude of entities, including another person, a tradition, even an enemy. Geoffrey-Smith continues, "Learning to share a life together involves acknowledging and accepting that the work of this sharing, and the labor of coming to a mutual understanding of it, is never over, always ongoing, and sustainable only under the shadow of love" (p. 371). By positing Globalization Three, Geoffrey-Smith's work supports programs such as GGSS, in which the education of students anywhere should be the concern of educators everywhere.

### **CURRICULUM AND GLOBALIZATION**

Likewise, the STEM curriculum of the GGSS program needs to be properly positioned with the backdrop of globalization. In "Globalization and Curriculum," Kathryn M. Anderson-Levitt (2007) begins with the question of what a good international or global curriculum would consist of. However, she points out that in order to address this question appropriately, first it is needed to consider three pre-questions. First, how are curriculum and instruction actually organized around the globe? Second, are curriculum and instruction becoming more similar around the world? Third, why do educators teach and learn what we do? The author believes that only after answers to these questions could educators ever consider whether there might be one proper curriculum for a global age.

In addressing her questions, Anderson-Levitt (2007) believes educators have converged towards a common cultural dialogue, which could also be viewed as a common cultural debate. This dialogue holds certain ideas in common, such as the core academic subjects, which the author believes reflects an increased homogenization of curriculum after colonization rather than during it. Anderson-Levitt (2007) writes, "Besides sharing a roughly common and converging curriculum countries around the world also arguably engage in the same dialogue about how curriculum and pedagogy should be reformed" (p. 354). She continues, "There has been convergence toward a common elementary core. This has happened even when colonies gained their independence, when one might have expected increased divergence" (p. 354). At a very broad level, there are common patterns in the actual enactment of schooling around the world. Nevertheless, Anderson-Levitt (2007) carefully points out the differences in national patterns, as well as dissimilarities within nations. The

divergences, and commonalities, curriculum in a globalized world frame this study's approach to STEM education in Nepal.

## **METHODOLOGY**

The methodological approach of this study was qualitative and utilized a thematic analysis design. The research questions asked, 1) how do Nepali secondary educators understand the STEM curriculum within the context of a U.S. funded STEM education program? and 2) how do these educators relate to the GGSS STEM curriculum as compared to the Nepali curriculum? Participants were selected purposefully from educators in Nepal who taught or implemented the Girls Get STEM Skills (GGSS) program. Participants were recruited from an existing Empowering Women of Nepal (EWN) list of educators working with the GGSS program. The EWN facilitated introductions between the researcher and GGSS educators. Participants were teachers and administrators from Navin Higher Secondary School, Janapriya Higher Secondary School, and Sheetaladevi Higher Secondary School. All three schools are located in the surrounding area of Pokhara valley.

The interview protocol, based on the research questions, was semi-structured and open ended. At the end of the interview, the researcher asked participants if they wanted to add to or change any of their responses. Participants were given an open opportunity to relay any additional information or opinions related to the topics not addressed in interview questions. A total of 18 Nepali educators were interviewed, including 10 individual interviews, and two focus groups consisting of six and two educators each. In addition to individual interviews, the researcher conducted two focus group interviews, observed two academic classes, and wrote daily field notes.

The opportunities for the focus groups and observations occurred in the natural context of conducting interviews at the research sites. At Shree Janapriya Higher Secondary School, the largest government school in Pokhara, the researcher was invited to meet with teachers in the Principal's office. Due to time restraints and space limits, the researcher chose to conduct a focus groups with all eight participants, rather than attempting to interview each participant individually. Similarly, the researcher chose to conduct a focus group with the EWN staff due to the preference of the participants.

Observations of classes took place at Shree Navin Higher Secondary School. These observations were conducted at the invitation of the teachers to visit their classrooms. The researcher observed an eighth grade science class and a tenth grade education class, and took copious notes throughout. In addition, at the invitation of the participants, the researcher was shown the science and computer labs at Shree Navin Higher Secondary School, where the researcher was permitted to take photographs. Lastly, upon returning to the hotel after each field visit, the researcher took field notes in a confidential journal. These notes were larger a stream of consciousness to capture impressions, initial thoughts, and reactions, and to assist with data analysis and reporting of the findings.

Upon returning from Nepal to the United States, the researcher transcribed the data recorded. The researcher typed all audio-recorded data, interview notes, observation notes, and field notes. The researcher also revisited all photographs taken while in Nepal. The thematic analysis approach was chosen in order to arrive at a more nuanced understanding of the social phenomena of the GGSS program and educators in Nepal through understanding the process and perceptions involved (Glesne, 1992).

Analysis was carried out in an iterative process. The researcher initially read the data and jotted down initial codes. Next, the researcher employed the technique of coding to discern themes, patterns, processes, and make comparisons. Coding was approached not just as a labeling technique, but a way of linking thoughts and actions across bits of data. This enabled the researcher to abstract code words and capture special words used by participants. The researcher made a catalog of codes in a codebook, listing major codes with subcodes

underneath to capture both the occurrence and prominence of themes present in the data. Through a progressive process of sorting and defining scraps of collected data, the researcher arrived at the findings, presented below. All names are self-selected pseudonyms.

## FINDINGS

Educators largely related to the GGSS STEM curriculum by recalling its superiority in curricular and material terms. One of the major themes of the interviews as a whole was that teachers perceived themselves as teaching practically when they used materials. When asked to compare the programs, Devi (personal communication, August 5, 2016) responded,

Very different. In that program, teachers use materials. EWN supported materials so we use materials. So students are learning skills. In regular class in our school, we did not use many materials. (p. 1)

The use of a practical curriculum led to teachers comparing the amount of materials they typically use with the amount they used in the GGSS program. For example, Devi (personal communication, August 5, 2016) said, “And also for the STEM, we had these materials to use and we had enough materials” (p. 2). Educators (personal communication, August 5, 2016) acknowledged the increased engagement and excitement among students with the GGSS curriculum and materials, “When we started such program in our school, students were very excited because they have the chance to play with the materials and to be taught with the materials” (p. 3). The use of materials ties in with other themes discussed above, such as perceptions of Nepal as an underdeveloped nation in need of development.

Teachers favored the STEM curriculum because of the practical orientation of the curriculum. The benefit of a practical curriculum was viewed in terms of the opportunity to use and manipulate materials. One GGSS educator (personal communication, August 4, 2016) observed, “When we started such program in our school, students were very excited because they have the chance to play with the materials and to be learned with the materials practically” (p. 1). There was a marked emphasis on the programs ability to engage the students in a fun manner through the use of materials. Abhishek (personal communication, August 5, 2016) reiterated,

This program is more practical and the more materials the girls were using the more they were learning and they were having more fun and it was more like learning through fun. He felt they were having great time and learning more doing this practical way. (p. 2)

Due to the use of materials, the GGSS educators felt the program the program was a more effective curriculum as compared to the Nepali curriculum.

Educators frequently contrasted the GGSS curriculum to the Nepali curriculum. In their minds, the GGSS program was practical, while the Nepali curriculum is theoretical. Chandrakanta (personal communication, August 5, 2016) explained,

When we start this program, we are very excited, we were very excited, not only us, but also the students have been excited mostly. Because it is one of the new technique: experiments. We have taught not practically but theoretically because of lacking the materials in our schools. In our teaching methods also, which is given by the government. When we started such program in our school, students were very excited because they have got the chance to play with the materials and to be learned with the materials practically. (p. 3)

The theoretical nature of the Nepali curriculum was largely judged to be because of a lack of materials. Thus, teachers could only explain what would “theoretically” happen in varying situations for their various subjects. In this curriculum, Nepali students were required to use their imagination. In the GGSS program, in contrast, students and teachers could conduct experiments to witness with their own eyes the concepts they were learning. This notion, of

experiments, brought a whole range of positive emotions to GGSS educators and participants, from excitement to enjoyment. Ijan (personal communication, August 5, 2016) explained clearly:

To be honest, most of the Nepalese are poor economically but in imagination we are rich. We would imagine, if we are teaching students some kind of sphere, to calculate the volume of the sphere, to calculate the total surface area, then we make them learn to visualize. They can learn to visualize, they can close their eyes and visualize one ball, we close our eyes and visualize one ball. So, that is how we learn, learned in past, but by this program we got real experience of such equipment, so it was not so hard and it was familiar although in mind already, although this time we did practically. (p. 2)

The difference between having materials, equipment, or resources meant, in part, the difference between the practical GGSS curriculum and theoretical Nepali programs.

Another important part of the GGSS program which educators judged to be superior was the pedagogy. A practical program meant not only that there were resources, but that students would learn primarily on their own volition. Instead of the knowledge being based with the teacher, the lesson revolved around the materials, experiments, and the learner. Sriya (personal communication, August 5, 2016) observed,

This program is more practical oriented. We get enough resources to participate each and every girl in the practical classes. But in our courses in Nepal, our course is theoretically based, but we follow lecture method. Teacher speaks and he speaks, and most of the times teacher speaks and they listen. That's passive method. But this, last time what we did in STEM program, it is more practical program and students get more encouraged. But in Nepal, our education system is lecture oriented and we follow the textbooks almost 90% and we don't have enough resources to enroll our students in practical classes, because economically we are a little back. (p. 3)

Students could engage in work with the materials, and each other, to gain knowledge. The approach was judge by GGSS educators to be more effective because it was collaborative and driven by the bottom up (the students) rather than top down (the teacher). Shyam (personal communication, August 5, 2016) stated,

We are very happy because they work together and to find the conclusion same. They enjoy with practical work. And gain knowledge. So this good. I think this good. They learn and excel and they found with practical the knowledge, not theory, the practical they learning procedure is practical based so that it is very good I think. The process is good. (p. 1)

With the GGSS approach, earning became a process of discovery with which student could engage in a tangible, hands on material.

Due to the judged superiority of the GGSS program, educators sought to incorporate aspects of the curriculum and pedagogy into their other classes. Using the STEM curriculum inspired teachers to try to incorporate new techniques into their own classroom. Deepak (personal communication, August 4, 2016) reflected, "After this STEM project, we are trying to improve the way we usually do and also do more practical in the regular ones. But then still there is a difference, there is a gap in between, because STEM is more practical way of learning" (p. 3). Ultimately, educators related to the material and practical orientation of the curriculum as a beneficial aspect of the GGSS program, which they sought to adopt and incorporate into their teaching style and curricula after the program had ended.

## DISCUSSION

Educators' perceptions of the STEM education, in particular in terms of its curriculum and pedagogy, as superior to the traditional Nepali school curriculum due to its material and

practical benefits points to broader processes unfolding in Nepal: an emerging middle class, decades of international development programs, and modernity. In *Suitably Modern: Making Middle-Class Culture in a New Consumer Society*, Mark Liechty (2003) explains, “Class is never a thing that exists by itself. Class is a process rather than object” (p. 53). Interestingly, the GGSS educators’ perceptions of the STEM program illustrate the ways in which this process unfolding in Nepal. Liechty writes, “class practice makes class a reality in its production of cultural space” (p. 53). Through the GGSS program, educators understood STEM education through the relatively new cultural space of the middle class in Nepal.

The project of creating the middle class in Nepal has not been a straightforward project of creating something where nothing existed before. Instead, it has been carved out, reconstructed, and adjusted in order to verify itself. Liechty (2003) explains, “Middle class in Nepal is a domain of internally competing cultural strategies, systems of prestige and status, and forms of ‘capital’ that are not strictly speaking ‘economic’” (p. 55). As a result, the dynamic upheavals of class construction involve new forms of social relations between neighbors and fellow Nepalis. He observes, “the middle class emerges as a never ending cultural project, simultaneously at odds with itself and with its class others. The middle class is a constantly renegotiated cultural space of ideas, values, goods, practices, behaviors” (p. 55). Thus, the GGSS educators understood STEM education almost exclusively in terms of its materiality and practically, perhaps in order to produce and sustain their own middle-class social identities.

Development programs often involve real tangible benefits being given to Nepal. For example, the GGSS program provided 30 laptops to be split between three government schools. As a result, these benefits create a lure people want to be a part of, and have led to the production of the middle class. Pigg (1992) observes, “Development bureaucracy has become the main route of social mobility through salaried employment, and the mainstay of an emerging middle class” (p. 511). However, in reality, these benefits often go to relatively few of the intended recipient and instead, the tangible gains of development lie in becoming a regular employee for a project that involves a job. Thus, the impact of development projects may be greater in the creation of an industry and associated middle class jobs rather than the projects, such as STEM education or hydropower, themselves. This helps to explain the educators’ repeated emphasis on the materiality of STEM education – the new materials benefited teachers both tangibly and socially.

Secondly, the notion of the middle class project can be placed within a larger process of the unfolding of modernity in Nepal. An important part of the middle class is being modern, and being modern in Nepal, means understanding other places. This understanding is seen as having the practical value of enabling one to manage in a wider world of modernity. Pigg (1996) explains,

The key modern concepts are cosmopolitan concepts not just because for Nepalis they are associated with the rest of the world but because the concepts themselves are mobile. Being cosmopolitan in Nepal means being able to draw on and maneuver with these notions. Being modern advantageously distinguishes a person in Nepal from others in the same village or same country. At the same time it sparks distant alliances. The lingua franca of modernity allows one to move, to speak with more people, to establish far-reaching connections. To claim a modern consciousness in Nepal is to claim membership to a transnational community of modern people. (p. 193)

Thus, the GGSS educators frequently articulated the practical nature of the STEM curriculum. In some cases, this referred to the student-centered pedagogy or use of materials to conduct experiments. However, other times the GGSS program was simply touted for its practical nature without further explanation. For example, one educator stated, “So they have got more knowledge in such practical ways, rather than the theoretical ways we attend

previously” (personal communication, August 5, 2016, p. 3). These practical ways of learning meant learning STEM, including how to operate a computer, which would enable students (and teachers) to connect with other places in the world in a modern way. The GGSS educators viewed the STEM curriculum as effective, which may be related to their view of GGSS as a modern curriculum. Thus, by expressing the desire to “be practical,” the GGSS participants divulged their desire to be modern.

Modernity in Nepal is set up in opposition to the traditional way of being Nepali. The GGSS educators, as middle class and modern Nepalis, embody the role of bringing modernity to their students and community. Pigg (1996) writes, “Modern ideas do not come exclusively from outside the local community, but are expressed within it by the cosmopolitan people who are also local” (p. 192). As ambassadors of modernity, tradition, like the village, is set up in contrast in an almost adversarial role. She continues, “In the process, tradition itself emerges as an object of self-conscious attention. The local comes into being through engagement with wider systems of many beyond, local and cosmopolitan are socially constructed positions” (p. 192). Thus, when educators in urban Pokhara describe the benefits of STEM education, they are drawing a distinction between themselves and the “traditional” Nepali who live in the surrounding areas of the city.

The comparison between the STEM and Nepali curricula is really a false comparison. Pigg (1993) again explains, “Overall, the very terms on which the development paradigm rests mitigates against ever really putting local knowledge and practice on par with development expertise. The asymmetry is built in at the foundations” (p. 52). Under the influence of modernity, traditional Nepali forms of knowledge have little chance of gaining educators’ preference when compared to STEM education methods. Ultimately, the GGSS educators reflect the way in which modernity and the building of the middle class has played out in Nepal. By gaining education themselves, and earning a living through their education, the educators participate in new economic and social spheres. Pigg (1996) argues, “Being cosmopolitan, being a relatively ‘developed’ kind of person, is a form of cultural capital. It is both a requirement for entry into other economic spheres and a result of participation in them” (p. 173). The opportunities of STEM education amounted to tangible possibilities, such as a future career in technology or the chance to become modern in a social sense. The social salience educators’ perceptions of STEM in Nepal are striking. Secondary educators viewed STEM as holding a practical and material value, in that it enables one to manage in a wider world, juxtaposed with a theoretical, stagnant Nepali education.

## CONCLUSION

This study sketches the broader connection between the field of curriculum studies and the social sciences. The work of curricularist William Pinar is particularly useful here in situating this contribution within the broader landscape of social science research in Nepal. In his classic article “The Reconceptualization of Curriculum Studies,” Pinar (1977) points to the major shift within the original field of curriculum studies in the late 1970s. As he states, “Most curricularists at work in 1977 can be characterized as traditionalists” (p. 168). In this sense, Pinar means that traditional curriculum specialists are concerned with teachers in schools, and their work tends to be field based. Curricularists thus tend to be former school employees whose mindset is in alignment with school practitioners. This work is only theoretical in the sense that it can be abstract, although its intent is clearly to guide those in institutional positions related to curriculum. All work is done with the practitioner in mind, rather than exploring theoretical topics for their own interest or development.

However, Pinar (1977) also introduces readers to two other groups of emerging curriculum workers. It is important to note that the relationship between these groups and schools still exists, although it is different from the alliance witnessed in traditionalists. This second group Pinar calls “conceptual-empiricists” (p. 171). Their work employs conceptual

and empirical approach in the sense of related social science disciplines. As Pinar explains, “This work is concerned with developing hypotheses to be tested, and testing them in methodological ways characteristic of mainstream social science” (p. 171). This work, often presented at academic conferences, uses conceptual arguments to process “hard data” and draw conclusions in line with other social science disciplines such as sociology (p. 171).

The last group Pinar (1977) presents is whom he labels the “reconceptualists” (p. 172). This group is distinguishable from the work of conceptual-empiricists and traditionalists in that it often has political aims. The reconceptualists often acknowledge their own “value-laden” perspectives and also intend to present a perspective in their work with a political emancipatory intent (p. 172). This contrasts with social science approaches in that reconceptualists view research as inescapably political, whereas social scientists strive for objectivity in their data collection. Reconceptualists see social scientists as contributing to the contemporary socio-political order and thus mark their difference by trying to liberate not only the researcher and their subjects, but also those outside the academic subculture.

Pinar’s (1977) discussion of the threads of curriculum studies, in the final analysis, reveals numerous paths to pursue curricular issues within the social sciences. He states, “We are not faced with an exclusive choice: either the traditional wisdom of the field, or conceptual-empiricism, or the reconceptualization. Each is reliant upon the other” (p. 174). For the field of curricular studies, its internal dialectic is an important part of its vitality and significance to the social sciences. But it is when studies strives for synthesis between the approaches, studies that are at once empirical, interpretative, critical, emancipatory, when the field truly moves forward. It is in this sense, as a synthesis of current perspectives, which the present study seeks to bolster the field of curriculum studies as a part of the landscape of the social sciences in Nepal. It is through research undertaken in this vein, I argue, that both curricularists and social scientists may be able to better understand educational developments in Nepal while simultaneously make their findings relevant for practitioners and citizens.

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