

Chapter 2

Multi-skill Foundation Course in India: The Head, Heart, and Hands of 21st Century Learning



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Abstract This chapter examines the Multi-Skill Foundation Course (MSFC), a vocational course conceived by grassroots NGO Vigyan Ashram, and further developed, replicated, and scaled up by Lend-A-Hand India (LAHI) since 2005. In collaboration with the State Government of Maharashtra, the course has been recognized under the National Skills Qualification Framework (NSQF) and adopted by more than 600 secondary schools across India. The purpose of MSFC is to promote employability, enhance student retention and increase the appreciation for vocational skills by uniquely intersecting vocational skills with 21st century skills in an experiential learning-based pedagogy. Our in-depth analysis of the MSFC includes an overview of vocational education in India, an explanation of the theory of change, and the effect of this niche reform in building 21st century skills. To understand the impact of the reform. We interviewed different actors and surveyed 111 students enrolled in the MSFC. In addition, we organized Focus Discussion Groups (FDGs) comprised of over 20 students from vocational courses, the MSFC, and non-vocational tracks. This analysis reveals that MSFC is having a positive impact on students and their communities by cultivating 21st century skills,

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enhancing employability, and improving gender inclusion through quality vocational education. The final section of the chapter identifies areas of consideration to further strengthen this niche reform and key takeaways from the MSFC.

In this chapter, we examine a secondary vocational program called the Multi-Skill Foundation Course (MSFC), administered by Lend-A-Hand India (LAHI). The MSFC balances the head, heart, and hands of 21st century education as it aims to equip students with a breadth of vocational skills and 21st century skills, through a hands-on student-centered pedagogy. This course empowers students to apply their skills to real world projects in collaborative settings. A study of the theory of action indicates a two-fold path to achieve the goals of the MSFC: *Project Swadheen* (Independence), the creation and implementation of the MSFC curriculum, and *Project Catalyst*, a mechanism to ensure the MSFC is scaling across India through private–public partnerships. However, this chapter focuses specifically on the impact of the course in cultivating 21st century skills in participants. This MSFC is unique because of its intentional integration of 21st century skills into vocational education, and in leveraging the mechanism of private–public partnerships to reach scale in India.

We begin our analysis by first contextualizing the social and political landscape of 21st century skills and vocational education in India. We then describe the methodology of our research and describe the MSFC theory of change. Lastly, we give a detailed description and assessment of the reform and conclude with key lessons learned from this analysis.

2.1 Context

2.1.1 Vocational Skill Development in India

By 2030, one third of the world’s working age population will hail from India, with the majority requiring skills the country’s existing system is not equipped to provide. The vocational training sector in India (also referred to as Technical and Vocational Education and Training, or TVET) is relatively small. Only 2% of students enrolled in vocational institutions and 4.69% of India’s workforce is considered skilled (British Council, 2016). India’s fast-growing economy and rapidly expanding workforce requires a strong push for vocational and 21st century skill development.

The National Policy on Skill Development and Entrepreneurship set out to “(1) create a demand for skill development across the country, (2) align skill development with required competencies, (3) connect the supply of skilled resources with national/global demand, and (4) foster entrepreneurship including women’s

entrepreneurship” (British Council, 2016, p. 20). Noting this, the *Skill India* initiative was launched in 2015 with the aim to train more than 400 million people in different skills by 2022. As a result, India has established different governmental organization in support of skill development; its aim is to introduce vocational education at the general secondary level.

Schools in rural areas that offer vocational education are contributing to the accessibility of skills training for all students. Introducing vocational skills in secondary school has its own challenges, as schools lack adequate financial resources, teacher training, and assessment methods to provide quality vocational courses. However, vocational education in secondary schools has a positive impact on school enrollment and high school graduation rates (UNESCO, 2013). In India, the “Vocationalisation of Secondary Education” reform aims to (1) enhance the employability of youth (2) maintain their competitiveness through provisions of multi-entry, multi-exit, learning opportunities and vertical mobility (3) fill the gap between educated and employable, and (4) increase school retention at the secondary level (World Bank, 2015).

2.1.2 21st Century Skill Education in India

Vocational and 21st century skill education is vital to India’s strategy for developing its knowledge economy. Dahlman and Utz (2005) identified a key lever in the progression toward a knowledge economy that is supported by the MSFC: increasing enrollment in tertiary vocational education. The authors make a compelling case for the necessity of educated and skilled workers, but stress that the key area that sets participants apart in the knowledge economy is the development of 21st century skills.

21st century skills can also be referred to as “life skills,” “soft skills,” “transversal skills,” “social emotional learning,” and “critical skills,” and are used interchangeably despite some significant differences across a range of personal, professional, and cognitive realms (Joynes et al., 2019). Although LAHI uses the term “life skills” in their internal communication, in this chapter we will refer to this set of skills as “21st century skills” given the specific focus on skills that align with Pellegrino and Hilton’s (2012) framework of 21st century skills, and the growing prevalence of this term in the literature. Developed by the National Research Council, the Hilton-Pellegrino framework aligns a range of cognitive, interpersonal, and intrapersonal skills that are intended to promote higher order thinking, student-centered opportunities and deeper learning to holistically prepare students for their futures. Despite the compounding evidence of policy and curricula highlighting the importance of 21st century skills in academics, a dearth of literature on 21st century skill coverage in vocational programs remains (Reeve, 2016; Salleh & Puteh, 2017; Tam & Trzmiel, 2018; UNESCO, 2012).

The multi-skill approach in this program is rare among vocational programs. Most countries view vocational training as an entry pathway into the labor force,

focusing on a depth of single-vocation skills to build employability for the labor market. This is evident in a variety of contexts, including Germany, Poland, Malaysia, and Vietnam (UNESCO, 2014, 2015). The MSFC broadens the purpose of vocational education to reflect the breadth of skills required in the 21st century. UNESCO and the International Labor Organization argue that vocational education is preparation for an occupational field and therefore, students should have the generic knowledge of occupations to be able to transfer these skills throughout their careers. The report specifically defines the aim of vocational education to “provide scientific knowledge, technical versatility and a cluster of core competencies and generic skills required for rapid adaptation to new ideas and procedures and for steady career development” (UNESCO & ILO, 2002, p. 27). The type of tacit knowledge embedded in multidisciplinary skills training becomes more important in labor markets as they grow into knowledge economies (Olssen & Peters, 2005).

Employers in the 21st century are interested in skills such as problem solving, working in a team-based environment, and effective communication. All told, the literature on context and best practices in 21st century and vocational education, and the projections of India’s labor force previously mentioned create a compelling case for a study of the MSFC. The following sections illustrate how the MSFC targets students’ development of these competencies: setting students up for success, whether that is measured by moving on to tertiary vocational education, higher education, entrepreneurship, or into the global business world.

2.2 Research Methodology

For our research, qualitative tools were employed to understand this niche reform, along with a quantitative survey to understand the self-reported impacts of the reform on students. The focus of our research was on the MSFC in the state of Maharashtra, as the course is well established there. In contrast, it has only reached scale across other Indian states very recently, making these states less relevant to our study. Our qualitative approach included analysis of secondary sources, such as the NSQF Policy Frameworks and documents, MSFC and other vocational courses’ teacher and student resources, teacher training intervention plans, evaluation rubrics, news articles, the websites of civil society organizations and the Hilton-Pellegrino framework to better understand 21st century skills. In addition to the secondary sources, we conducted fifteen interviews with various actors responsible for implementation and instructor training (Appendix A; Appendix E).

To further understand the impact of the MSFC, we adopted a mixed-methods approach, combining quantitative data with qualitative information from our research (Weiss, 1998) as well as previous impact reports from Sattva Consulting (2019), Change Alliance (2019) and Tata Trust (2013). Our data collection tool was a Likert-scale survey adapted from the instrument developed by Reimers and Chung (2018) in his quasi-experimental analysis of Injaz Al-Arab’s Company program, as well as previous impact assessments, to reflect the context of the MSFC

(Appendix B). This tool was translated and verified in Hindi and English by team members and is intended to measure attitudinal and 21st century skill changes in students because of the MSFC. The tool was used to collect data from 121 participants in the MSFC. Participants in the study were from diverse demographics: 47% were rural, 53% were from urban settings, 61% identified as female, and 39% identified as male. Additionally, we conducted interviews with Focus Discussion Groups (FDGs) to better understand our tool as well as the results and implications of the MSFC (Appendix C). The FDGs comprised of over 20 students from the MSFC course (including alumni), non-vocational tracks and non-MSFC students enrolled in other vocational courses.

2.3 The Why Behind the MSFC

The Multi-Skill Foundation Course (MSFC) was designed to address the inadequacies of the education system in Maharashtra where there is a 62% dropout rate in middle school and a 76% dropout rate in high school in rural areas (ASER Centre, 2011). It is also intended to respond to the growing gap between the skills provided to youth and the skills needed to thrive in a fast-changing world. India will add roughly 300 million people in the working age group (15–25 years old) to the world by 2040. However, only 4.69% of the workforce in India has developed marketable formal skills, compared to 96% in South Korea, 75% in Germany, 52% in the USA, and 24% in China (Financial Express, 2019). Young people in India view factors like gender and caste-based discrimination, lack of practical education, and lack of mentorship opportunities as major barriers in gaining employability skills (UNICEF, 2018). In high school particularly, the emphasis on academic education is to memorize information for the purpose of getting a grade (Tata Trust, 2013).

This gap was first highlighted by Sunanda Mane, the co-founder of Lend-A-Hand India, during her work with international development projects. Her experience working on workforce enhancement and development across the world greatly influenced the design of the Multi-Skill Foundation Course, its pilot in Maharashtra, and its subsequent adoption by the government. To quote Ms. Mane, “Our schools have great curriculums, but it is critical how they are dispensed. Rote method of learning is rampantly used, which is killing student’s creativity, inquisitiveness, analytical and comprehension ability, and even interest in learning and in going to school. To make the learning process meaningful, useful and relevant, Lend-A-Hand India identified the Multi-Skill Foundation Course as a possible answer to this problem,” says Mane.

The MSFC scaled nationally, as the Maharashtra Department of Education advocated for adoption of the MSFC as part of the NSQF. In the context of the newly formed National Skill Development Corporation in 2008 and the Skill India

campaign by the Prime Minister of India in 2015, advocating for a skill-focused multidisciplinary program was not only relevant, but *essential*. The Government of Maharashtra Department of Education's application to get MSFC recognized as an NSQF compliant course for students nation-wide took five years, with the advocacy process beginning in 2013 and the formal adoption of the course concluding in 2018 (Fig. 2.1).

The recent formation of the National Skill Development Corporation (NSDC) and the Sector Skill Councils affiliated with it gave the MSFC the necessary certification and qualification, thus enabling it to scale. The NSDC was established to revolutionize the skills landscape of India, with a strong focus on building the sector from the ground-up (YourStory, 2019). NSDC was formed by the Ministry of Skill Development & Entrepreneurship, which also holds 49% shares in NSDC (NSDC India, n.d.). With Sector Skill Councils affiliated with NSDC undertaking assessment and certification of MSFC and subsequent approval by National Skill Development Agency (NSDA), MSFC was quickly recognized under the National Skill Qualification Framework.

2.4 Theory of Change

The underlying theory of change is established through three broad goals: (1) to promote employability, (2) to increase student retention, and (3) to promote dignity of labor.

Students in the MSFC build a breadth of skills and knowledge across vocational sectors (Dasra, 2012; Government of Maharashtra, 2015). The skills that MSFC hopes to target include intrapersonal (self-efficacy, capacity for life-long learning, perseverance, self-management, confidence, and integrity), interpersonal (communication, time management, collaboration, and teamwork) and cognitive skills (problem solving, creativity, innovation, and critical thinking) (Lee, 2016; Pellegrino & Hilton, 2012; Reimers, 2020). Additionally, the MSFC's intended outcomes include practical and theoretical knowledge in four core sectors. These include Workshop & Engineering Techniques, Energy & Environment, Gardening, Nursery and Agriculture Techniques, Food Processing Techniques (9th grade) / Personal Health & Hygiene (10th grade) (Central Board of Secondary Education, 2020). Further, the MSFC aims to address gender stereotyping and roles among students by giving them opportunities to practice these interpersonal skills together, across the core sectors. These outcomes are collectively assessed by both schools and specific Sector Skill Councils which are affiliated with the National Skill Development Corporation.

Students enrolled in the MSFC can access these skills and experiences through a class that is integrated within their standard school day. Schools may opt for MSFC from a pool of 73 vocational courses under the National Skills Qualification Framework (NSQF) (Lend-A-Hand India, 2020).

The MSFC is facilitated by a trained external instructor. The government provides schools with a lab and required equipment for the four core sectors covered in the course. Students meet with the instructor in this lab once a week over 9th and 10th grade (Central Board of Secondary Education, 2020).

The implementation of MSFC has its foundation in the training of instructors and budgetary allocations by the government towards instructors' salaries and the MSFC lab equipment. Instructors from private vocational centers are selected to train with LAHI to facilitate the MSFC. These instructors are evaluated by LAHI and are remunerated by the state government for their services. Since these pivotal steps require government resource mobilization at various levels, LAHI deploys a Program Management Unit made up of experienced coordinators, program associates and training usually in the Samagra Shiksha department of the state.

2.5 Theory of Action

The Theory of Action of MSFC can be defined by two projects implemented by Lend-A Hand-India: *Project Swadheen* and *Project Catalyst*. The MSFC integrated skill-based education in two schools as the initial pilot project titled *Project Swadheen* before scaling to the national level through consistent advocacy and cooperation with the government through a project titled *Project Catalyst*. This section illustrates the mechanisms of implementation that various stakeholders, adopted from the pilot to the integration of the MSFC at a policy level.

2.5.1 *Project Swadheen*

Lend-A-Hand India's journey with MSFC began in 2005, with a pilot in two government-aided private schools in rural Maharashtra. Afterwards, the MSFC was integrated in the official curriculum and implemented in 100 schools across thirteen school districts in Maharashtra (Dasra, 2012). At this stage, LAHI would contribute 80% of the operational costs for the first three years, reduced by 10% every year after that. After a few years of implementation, schools would also charge a fee to parents towards covering the costs. Initially, instructors were selected from the local community, and included microentrepreneurs and homemakers. As the MSFC scaled, these local community members were replaced by staff with vocational certifications. Currently, the MSFC is implemented in 331 schools across Maharashtra and 18,210 students are enrolled in the course (Lend-A-Hand India, 2019; Pathak, 2019).

2.5.2 *Project Catalyst*

The Government of Maharashtra, through the Department of Education, took five years to introduce the MSFC as a course for students nation-wide, with the advocacy process beginning in 2013 and the formal adoption of the course concluding in 2018. As the MSFC was adopted nationally, LAHI deployed their team members in education bodies of 24 state governments across India, providing technical and project management support to scale up vocational education within the state, advocate for the MSFC and monitor the course in those states. This project is called *Project Catalyst* (Lend-A-Hand India, 2019). The strategy is to place qualified LAHI team members in government offices to provide domain expertise and work alongside government officials to ensure effective delivery of vocational education in the secondary and higher secondary school, and that the MSFC is implemented efficiently and with fidelity. Today, LAHI is supporting skill education in over 10,000 schools and reaching over a million students (Lend-A-Hand India, 2019).

2.6 Program Description

2.6.1 *The Integration of 21st Century Skills in the MSFC Curriculum*

MSFC's theory of change is based on the integration of 21st century skills into multi-skill vocational training. Lend-A-Hand India focuses on a breadth of skills and vocational experiences across sectors as opposed to a limited area (Dasra, 2012; Government of Maharashtra, 2015). Although not traditionally a part of 21st century skill instruction, this course's focus on destigmatizing work that crosses traditional gender lines can be viewed as increasing self-awareness and critical thinking skills and, although not explicitly a part of the theory of change, is a notable goal of LAHI's leadership team.

2.6.2 *Curriculum*

The MSFC operates on a "learning by doing" model, which is designed to encourage employability through the cultivation of skills and project-based work. It is a skill-based curriculum that focuses on direct training in skills followed by real-world group projects where students can apply those skills within their communities. All groups are mixed gender and have 21st century skill instruction embedded in the work. In the curriculum there are various vocational skills included, such as carpentry, welding, basic wiring, gardening, food processing,

plumbing, and basic first aid (Lend-A-Hand India, n.d.a). Students have a regular instructor for the duration of the year and receive specialized instruction in specific technical skills (plumbing, for example) from guest lecturers, or through field visits. Whenever possible, the program tries to draw from the pool of parents in the class or school for these activities. Additionally, if there is a parent or guest lecturer available whose role does not reflect traditional gender norms (such as a female plumber or a male tailor), intentional efforts are made to work with those individuals, to reduce stereotypes associated with vocational trades. Systemization for how these guest lecturers and field visits prioritize destigmatizing gender roles is not clear.

2.6.3 Projects

Students work together, under the guidance of the instructors, to select group projects based on the needs of the community. The identification of these needs is an important skill that exemplifies the spirit of learning by doing that the MSFC is built on, and further demonstrates how the MSFC exemplifies 21st century learning, going beyond what is typical in vocational education.

One example of such a community project is in *Wazirabad*, where students applied their recently acquired plumbing knowledge to fix a broken pipe. This pipe had previously led to a dysfunctional water fountain in their school. This project served the community by both restoring the students' supply of drinking water and allowing this group to apply their newly taught skills. Other projects include making and selling goods, such as pickles or small wooden goods made in their food preservation and carpentry classes. Students use 21st century skills like communication, self-confidence, creativity, innovation, collaboration, teamwork, critical thinking, perseverance and problem-solving when they engage in their projects and the sale of their crafts.

2.6.4 Capstone

At the end of each year, there is a celebratory event called Swadheen Yatra. At this celebration, students present what they have learned over the duration of the course to teachers and students from their school (Lend-A-Hand India, n.d.a). The event is designed to expand community awareness of the course's impact on students, provide a chance for the community to support students' skill development, and give further chances for students to practice 21st century skills, such as leadership, communication, and presentation skills.

2.6.5 *Module A*

It is important to note that all students across the 18 National Skills Qualification Framework courses take the same 50-hour class in employability skills called Module A. There are five subjects covered: communication skills, self-management skills, ICT skills, entrepreneurial skills, and green skills (Central Board of Secondary Education, 2020). These skills are taught through a teacher-centered pedagogy and assessed using multiple choice assessment—which is distinct from the pedagogy of the MSFC (Central Board of Secondary Education, 2019).

2.6.6 *Instructor Capacity*

Instructors of MSFC classes are not typically career educators and have an engineering or a technical degree, often from one of the Industrial Training Institutes. There has been a focus within LAHI on the importance of pedagogy and training for instructors so that vocational and 21st century skill instruction occurs in an effective and student-centered manner. To support this goal LAHI has developed two programs: *Saksham*, a capacity building and mentorship program; and *ChalkLit*, a mobile application to support instructors vocational and pedagogical development.

2.6.6.1 **Setting Clear Expectations**

Instructors and supervisors use a rubric adapted from Teach for India's model to assess and drive future instructor growth. In addition to on-going professional development opportunities and quarterly external evaluations, the program sets clear expectations for instructors as recommended in the literature (Villegas-Reimers, 2003).

2.6.6.2 **Instructor Preparation and Ongoing Mentorship**

The *Saksham* capacity building program started in November 2018 and is focused on supporting instructors by equipping them with pedagogical tools and a support system through a team of coaches. LAHI demonstrated reflection and growth through their development of this program. Initially, the program targeted pre-service instructors, but as staff noticed that some of the tools were not being applied in classrooms, they expanded *Saksham* to include regular mentorship throughout the school year (Lend-A-Hand India, n.d.b).

2.6.6.3 Ongoing Just-In-Time Instructor Support

The *ChalkLit* app makes all content related materials easily accessible to instructors. Standards, lesson plans, and pedagogical tools, such as discussion prompts, are available for every subject. Additionally, there is support for developing vocational content area expertise. Given that instructors likely had expertise in one of the areas of the MSFC prior to becoming instructors, it is understandable that there may be gaps and limitations in their pedagogical capacities; for example, an engineer may need training in food processing, plumbing, or agriculture, to be a more effective educator (Lend-A-Hand India, n.d.c).

2.6.6.4 Instructor Monitoring and Ongoing Targeted Improvement

Instructors are evaluated using a rubric that covers competencies of planning, execution, and building classroom culture, adapted from the rubric Teach for India uses to support its fellows (Lend-A-Hand India, n.d.f). Instructors are introduced and trained in how to use the rubric in their preservice training, and then engage in regular observations with coaches throughout the year guided by the rubric. Instructors and coaches each assign a performance score within each category at four points throughout the year to track progress and to understand personalized priorities for development. This allows instructors to reach better results with their students (Lend-A-Hand India, n.d.e). Regular classroom observations are uncommon in India and typically occur after a problem has been identified. There has been a need to destigmatize observations and rubric evaluations so they are seen as tools for growth rather than as punitive measures.

2.7 Realized Outcomes and Analysis

Evaluating the MSFC is essential to help us understand how the course is fulfilling its vision. In the last ten years, there have been three major impact assessments, each of which help us understand MSFC's results in schools. In addition to these assessments, we analyzed MSFC's impact on students by conducting self-reported surveys with currently enrolled MSFC students ($n = 111$), along with four focus group discussions with samples from the following populations: current MSFC students, alumni of MSFC, non-MSFC students enrolled in other vocational programs and students enrolled in regular academic programs who do not receive any vocational training. Our analysis and the impact assessments conducted by Tata Trusts (2013), Change Alliance (2019) and Sattva Consulting (2019) reveal that MSFC is fulfilling the goals highlighted in the theory of change: (1) to promote employability, (2) to increase student retention, and (3) to promote dignity of labor.

2.7.1 Retention

2.7.1.1 Increased Student Retention and Performance

As the results demonstrate, the MSFC has had a direct impact on increasing student retention by improving attendance and students' attitudes towards school, thus leading to improvement in other disciplines. As a result of the MSFC, students have reported that they are more interested in attending school. Based on self-reported results from the student surveys we designed, 94% of students believed the MSFC inspired them to be more regular in school; 94% noticed an increased interest in their studies; and 82% felt they were more likely to participate in class. Instructors reflected those students are enthusiastic to learn and rarely miss an MSFC school day. It is important to note that specific attendance data was not available to us, and a comprehensive review of such data will illuminate insights into the true impact of the MSF on this parameter. Further, past analysis shows that the practical training provides MSFC students an advantage in theoretical subjects, as they learn to link abstract concepts to real-life projects. Students demonstrated 30% improvement in Science, 28% improvement in Environmental Science, 13% improvement in Language and 14% improvement in Math. Overall, students feel engaged in the MSFC and enthusiastically participated in all activities which appears to have had a ripple effect into their general studies.

To magnify these impacts on retention and attitudes towards school, the MSFC should become more available to all students. Students who want to pursue a career in business felt that other courses, such as Retail, might be better suited to this. In some schools, MSFC is offered at the same time as a second language, and students feel that language should be a priority. Advocating for non-competing time slots, as well as sharing the story of the MSFC across various media platforms and hands-on learning days will persuade community members of the benefits of the MSFC (Bardach, 2019). Naturally, it is unrealistic to expect all students to partake in the MSFC when there are other well suited vocational courses. However, understanding why students are and are not choosing to participate, as well as sharing the power of the MSFC, will certainly allow more students to benefit from this course.

2.7.2 Employability

2.7.2.1 Employment and Future-Making

The MSFC has provided students with opportunities to explore a variety of careers, while providing them with 21st century skills required to thrive in our ever-evolving world. In our self-reported surveys, 83% of students indicated that the MSFC broadened their horizon for potential careers and inculcated an understanding of what is required to achieve goals.

Past studies show that, prior to MSFC enrollment, students thought that the only viable career options were medicine or law. However, 90% of students self-reported in our surveys that they felt the MSFC provided them with employability skills that will help them to secure a job in a variety of fields outside the “traditional” roles, as the course was highly relevant. In contrast, our recent FDGs revealed that non-MSFC students were aware of the skills required of them, mentioning self-confidence, perseverance, communication, self-discipline, goal setting, and collaboration. However, they elaborated that their regular school curriculum does not allow for such skills to be built.

The MSFC has enhanced the employability of students due to the exposure to basic vocational and 21st century skills. These effects are reflected in the reduction in the unemployment of MSFC students in past studies. For male MSFC students, the unemployment rate is 6%, and for female MSFC students it is 33%—just half of the national average (Shiksha, 2020). During our FDGs, one alumnus of the MSFC reflected on starting his own garden nursery (one of the skills taught in the MSFC). He believed that the MSFC had a direct influence on him, giving him the confidence to aspire to his dreams and providing him with the skills to engage in meaningful work.

2.7.2.2 21st Century Skills

In addition to the positive increase in employment associated with taking the MSFC, the course also seeks to build employability through the integration of 21st century skills.

21st Century Skills: Cognitive Skills Based on our FDGs, the MSFC students had a clear understanding of the skills they gained during the course. This is likely reflective of how intentional the course was in establishing its curriculum and building these skills in students through the capstone project, *Swadheen Yatra*. Through the “learning by doing” model of the MSFC, students cultivate the following cognitive skills: problem-solving, creativity, innovation, and critical thinking (Lee, 2016; Pellegrino & Hilton, 2012; Reimers, 2020). One project that highlights the use of these cognitive skills was when students responded to the needs of their community by repairing the pipes that supplied a water fountain, restoring water access to a portion of the school. Not only did they have to identify the issue in their community, but they also had to problem-solve to develop potential solutions. Due to the multi-skill nature of the course, students developed critical thinking skills as they worked through the design process, transferring their skills to new situations and taking initiative to learn new skills from experts in the community. Through this iterative problem-solving process, they were able to apply these cognitive skills to real-world contexts and address a need in their community. According to our self-reported surveys, 86% of students indicated the MSFC cultivated problem-solving skills, 84% of students reported being able to make connections between the MSFC and real-world contexts, projects, and coursework, and 76% of students agreed that the course inspired creativity as students have to

continually apply their knowledge to engender creative solutions and project ideas. In both our FDGs and in qualitative data collected by Sattva Consulting, students specifically mentioned that they were continually revising and adapting plans to make things work, applying what they had learned in the course (2019).

21st Century Skills: Interpersonal Skills

Furthermore, there is evidence to suggest that the MSFC cultivates a range of interpersonal skills including communication, time management, teamwork, and collaboration (Lee, 2016; Pellegrino & Hilton, 2012; Reimers, 2020).

Regarding time management skills, 87% of MSFC students indicated in our self-reported surveys that the course cultivated time management skills, as students had to plan and manage their projects. For teamwork, 96% of students noted an increase in their ability to collaborate and work well in teams because of the MSFC. All projects through the MSFC are completed in assigned, mixed-gender small groups. Here, students are equipped in building collaboration skills as they engage in projects and problem-solve together. Through this, they learn that working as a team is more effective as it enables various perspectives and ideas to be voiced. In our FDGs, students highlighted that teamwork and collaboration revealed that everyone has a different thought process that should be respected and valued. Teamwork also empowered leadership skills as 88% of students indicated the MSFC enabled them to grow in leadership abilities and the understanding of what makes a good leader as they each had the potential to lead projects and had assigned roles during projects. Communication skills were also highlighted in the surveys. According to respondents, 91% of students indicated that the MSFC had a direct impact on improving their ability to communicate with others through the continual presentation of ideas and projects, with 81% indicating an increased ability and confidence in presenting to peers, and 75% identifying the ability to now present to strangers and adults. Past studies show that MSFC alumni felt more confident in communication and decision-making and felt better equipped to manage time.

21st Century Skills: Intrapersonal Skills.

For intrapersonal skills, the MSFC facilitates the cultivation of self-efficacy, perseverance, self-management, and confidence (Lee, 2016; Pellegrino & Hilton, 2012; Reimers, 2020). In our surveys, 87% of students self-reported that the course promoted initiative and self-motivation. Elders and parents in local communities have shared how students initiate improvements in their communities as they help with electrical wiring, motor repairs, and promote organic agricultural practices. At the school level, students are motivated to engage in basic repairs, such as repairing cabinets, desks, or chairs that would otherwise remain damaged due to limited resources. In one of the MSFC modules, students learned tangible strategies for managing stress. As a result, 68% learned how to manage their stress. 92% of students indicated a new level of perseverance and persistence in school as they had to investigate, troubleshoot and problem solve various needs within their

community through projects. Through hands-on experiences students reflected on creating multiple iterations of products and projects, and troubleshooting until they had an exceptional project or product. Additionally, the MSFC appears to be particularly impactful with regards to confidence as 94% of students self-reported that they gained confidence in a variety of areas, including working with others, sharing their opinions, and communication. The opportunity to continually work on these skills through the MSFC, coupled with support from teachers and community experts, enables students to get and respond to feedback and thus, build this confidence.

Assessment of 21st Century Skills

There is overwhelming evidence based on this self-reported information to suggest that the MSFC is equipping students with 21st century skills. However, little evidence is available for the ongoing assessment of such skills in the course. For example, while students give many oral presentations and sell the products to strangers, the communication competency is not explicitly assessed. Members of the Global Education Movement and PISA are striving to develop a multimethod approach to assessing 21st century skills and attitudes, recognizing the importance of their integration (Schleicher, 2018). The MSFC organizers should look to these organizations as well as local ones, like Dream a Dream India, who have already created an assessment instrument for teachers to strengthen their approach (Natraj & Jayaram, 2018).

2.7.3 Dignity of Labor

Considering the wide-ranging demographics of the MSFC participants and their exposure to a variety of vocational practices, it can be said that the course has supported dignity of labor for a diverse group of students and has altered the perception that vocational education is only for students with low academic achievement. By exposing students to a variety of careers, community experts, skills, and service projects, students develop an awareness of the value of trades. Past studies show that 97% of MSCF students are satisfied with the course and would recommend it to others. As a result of supporting the dignity of labor, 56% of MSFC students pursue further vocational education, in comparison to only 20% of non-MSFC students. Our FGDs revealed that alumni of the course believe the MSFC should be made accessible to more students. Students are excited by the diversity of the MSFC, with one student in the FGDs specifically reflecting that “anyone can do anything.”

2.8 Further Insights

In addition to the positive realized outcomes of the MSFC's theory of change, our research reflects that the course has had a positive impact in other areas, including building teacher capacity, community connections, and gender inclusivity. Based on the best practices in education, we examine these unintended consequences and approaches.

2.8.1 *Gender Inclusivity*

While the MSFC theory of change does not directly target addressing gender inclusivity and stereotyping, interviews and resources reflected that this is an important proponent to stakeholders, particularly LAHI's co-founder, Sunanda. The MSFC moves beyond societal expectations, serving as a bridge between students of different genders by promoting cross-gender groupings and bringing in vocational experts as guest speakers who defy traditional expectations of gender roles (for example, a female plumber). Students learn to respect each other, work together, and overcome traditional gender stereotyping and roles, initiating a much-needed reduction in the gender-based disparity (Eswaran et al., 2013; Tandon, 2018). Typically, it has been reported that enrollment in most vocational programs is highly skewed in the direction of traditional gender stereotypes. For example, enrollment in textile courses is predominantly female, while enrollment in automotive-related courses is disproportionately male (Ratho, 2019). However, the MSFC is typically evenly split, with 54% of participants being female and 46% male, all engaging in various vocational skills.

Students and teachers have noticed that students' perceptions of gender roles and collaboration with different genders has also shifted. On this topic, during our FGDs, one student reflected, "I used to believe only boys could do engineering but now my perception has changed." In past interviews and surveys with parents, conducted by Sattva Consulting, 99% (n = 148) shared that they had perceived changes in their child pertaining to stereotyping and gendered roles, with 91% mentioning that their boys have been participating in domestic tasks on a regular basis since engaging with the MSFC (2019). Additionally, 90% of MSFC students felt they learned how to cooperate and collaborate with different genders. Despite these strides, however, instructors still notice that boys and girls sit separately and rarely choose to be in groups with the opposite gender unless it is imposed on them. Since this is a cultural shift that would take time, and since participants see the benefit of this by the end of the course, the MSFC should continue to monitor and strive to actualize this important aspect of their program.

2.8.2 *Community Connection*

Further analysis revealed that the MSFC motto of “learning by doing” is actualized through meaningful community connections. This feature of the MSFC is noteworthy as it enables the impact of the MSFC to transcend beyond student employability, retention, and dignity of labor. Through the realized dignity of labor, students are pursuing various initiatives to serve their communities. Students, families, and communities have benefited from the course at the household, school, and community level. 88% of students believed they applied the skills from the MSFC outside. MSFC students engage in their communities by using their skills in a variety of ways, such as to help parents cook, fix mixers, and repair *Diwali* lights.

At the school level, it is common for MSFC students to repair damaged chairs, tables, and benches. Some of the broader community projects carried out are (1) construction of *Vanrai Bandhara* (seasonal water harvesting/structure), (2) preparing *Rakhis* (products used in an Indian festival) and stalls in *Jatras* (local fairs), and (3) selling local sweets and savory snacks (Shiksha, 2020). The technical skills that students learn during the course are easily applied at home or work environments, and students have been able to find innovative solutions to local challenges and feel empowered to serve their communities.

Additionally, the MSFC brings in community guest lecturers from diverse backgrounds to share their experiences and knowledge on certain topics. This, too, strengthens the ties to the community, while also promoting gender inclusivity, dignity of labor, and retention efforts, allowing participants to see the value of diversity as well as a variety of career options. The MSFC’s desire to include opportunities for students to develop projects that respond to local communities’ needs, as well as the intention to include non-traditional guest speakers are noteworthy initiatives that impact the outcomes of the MSFC. Such real-world engagement and experiences are considered best practices in the realm of education, particularly when cultivating 21st Century Skills (Deans for Impact, 2015).

However, such experiences do not appear to be systemized across schools, and there is little accountability of this. For example, at inception, the MSFC relied heavily on guest speakers. However, since being an offered course in schools, it is the discretion of the instructor to invite and connect with guest speakers. Incorporating these aims into the instructor evaluation rubric, as well as supporting instructors in facilitating community engagement, will further actualize this important lever across schools. Not only will this benefit students as it is an important lever in promoting the program goals, but it will also reciprocally benefit the community by expanding real-world learning and connections (Deans for Impact, 2015).

Further, these community connections might be further strengthened through internships. This amplifies the “learning by doing” multi-skills approach of the MSFC, which is a powerful framework that enables students to cultivate a solid repertoire of 21st century skills and vocational skills. As the MSFC continues to adapt and grow, they are planning to include internships as a requirement of the

course to strengthen the necessary experiential learning component of the course (Deans for Impact, 2015; OECD, 2011; Reimers, 2020). These sentiments were echoed by participants in our FDG, who believed that internships would be both practical and exciting. To ensure a successful internship program, the managers of the MSFC and government actors should plan a program that balances the vision of the MSFC and the needs of students and organizations by setting clear expectations and feedback loops.

2.8.3 Instructor Interventions

LAHI's interventions to support instructor capacity are reflective of most of the World Bank's Systems Approach for Better Education Results (SABER) Teacher's framework. The eight dimensions included in the SABER approach are: setting clear expectations for teachers, attracting the best into teaching, preparing teachers with useful training and experience, matching teachers' skills with students' needs, leading teachers with strong principals, monitoring teaching and learning, supporting teachers to improve instruction, and motivating teachers to perform (Liang et al., 2016; Reimers & Chung, 2018; World Bank, 2013). The dimensions supported in the current approach include setting clear expectations for teachers, preparing teachers with useful training and experience, monitoring teaching and learning, attracting the best into the workforce and supporting teachers to improve instruction. In addition to these, the program also provides strong leadership for its instructors, although this support comes from the Program Management Unit members, not principals.

As a result of the push to build teacher capacity as a mechanism for achieving the programs goals, students felt valued and supported by their instructors—a theme which was reflected strongly in the FDGs. It is this personal connection that students identify as having enabled them to thrive and learn 21st century skills at a deeper level (Deans for Impact, 2015). During our FGDs, students reported that they had a strong connection with their MSFC instructors as they took a genuine interest in them and helped them to pursue their abilities. The level of care reflected by the instructors is likely a reflection of a pedagogical intervention provided for instructors titled “Know your students” (Lend-A-Hand India, n.d.f).

While noteworthy initiatives to build instructor capacity have been reflected throughout documents and interviews, there are elements of the SABER framework that are not addressed. These include motivating teachers to perform and matching teachers with the needs of students. Since instructors are not full-time teachers and the availability of instructors is often limited, it is difficult to match teachers with the needs of students. To motivate teachers, we recommend that instructors be given incentives to take pedagogy and philosophy courses at teacher training institutes, which would help them to align themselves pedagogically with the vision of education in India (World Bank, 2013).

Additionally, certain features of the SABER framework already included in MSFC's approach to building teacher capacity can be expanded. Specifically, ongoing support and monitoring of teachers could be strengthened to ensure the MSFC's goals are being reached. In addition to the existing quarterly external evaluations, school leaders should conduct frequent formative reviews to hone instructor's teaching capacity and professionalism (Kools & Stoll, 2017; Liang et al., 2016; World Bank, 2013). Additional formative supports should be implemented to support instructors through either instructor support networks like the "Formative Support System" in Cambodia (Donaher & Wu, 2020) or in-school mentors. This will enable instructors to better understand the context of the schools they are working in, as well as collaborate with fellow MSFC instructors across schools (Kools & Stoll, 2017; Liang et al., 2016). In adding and refining these elements, the MSFC will build a model that aligns itself more intentionally with the SABER framework designed to empower teachers (World Bank, 2013).

2.9 Limitations of Research

Our results and analysis are promising; however, there are limitations in our approach. While the self-reported surveys and FDGs revealed that beneficiaries identify MSFC as a key player in cultivating important 21st century skills, there are other non-profit interventions in these schools which could be directly and indirectly supporting students in the acquisition of these skills. These interventions include the intentional exposure to, and betterment of, 21st century skills from Akanksha and Design for Change India (Natraj et al., 2016; Vengathattil, 2019).

Further, in our FDGs, it became apparent that various 21st century skills are being taught in other vocational tracks. For example, students in the Retail course—one of the other vocational tracks offered in the public school system and the skilling course most like the MSFC—students confidently referred to the negotiation and communication skills they were proud to have acquired. However, these skills were learned through lecture or role-playing, which is unlikely to provide the same opportunity to gain procedural knowledge of these skills that the "learning by doing" model of the MSFC offers. Further research should be conducted to ascertain the true impact of the MSFC. This work should include a longitudinal study with pre- and post-analysis of the MSFC, controlling for external non-profit interventions to gauge the true impact of the MSFC on 21st century skills, enjoyment of school, and improvement in attitudes. A similar analysis like the quasi-experimental design and methods employed by Reimers, Ortega and Dyer in their analysis of Injaz Al-Arab's Company Program should be adopted (2018).

Additionally, it is important to note that our data was collected during the COVID-19 pandemic, which may affect students' self-reported perceptions of skills learned—particularly non-cognitive skills, such as socioemotional learning or

personal wellbeing. Upon reviewing the data, we noticed that while self-reported measures of the 21st century skills were consistent across previous impact reports, in our data collections, certain skills decreased in effect. Managing stress decreased from 81% in the Sattva Consulting report (2019) to 68% in our data. Similarly, creativity decreased from 87% in the Change Alliance (2019) analysis to 76% in our results. Reasons for this should be investigated: they could either be a result of the pandemic, or due to implementation barriers in the course itself. It is also important to mention that these are the skills that were amalgamated into the mandatory Module A course, which is consistent across all the vocational skills courses under the NSQF. Upon reviewing Module A's activities, it appears to be quite theoretical, detracting from the hands-on approach focused on by MSFC. Further investigation of the drop in these skills is required to understand the root cause.

Furthermore, future interviews should focus on understanding instructor capacity, as this is a relatively new piece of this reform. Current evidence is based on student reflections, program coordinators insights and teacher evaluations. Interviews with instructors will yield further insights into the efficacy of the teacher interventions designed to support 21st century skills and the implementation of the MSFC. Another area of focus for future interviews is to investigate if there was any potential impact of the MSFC on students' family and home life. Given that there is such clear engagement with the wider community, it is worthwhile to get an understanding of if, and how, the types of broader community connections that are developed are also present in the home. An additional FGD with parents and family members of enrolled students and alumni could foster more insight about other potential impacts of the program.

Lastly, due to the time constraints and the COVID-19 pandemic, we were unable to expand our research to collect quantitative data for non-MSFC and non-vocational students in general. Additionally, we were unable to have a completely random selection of students to interview qualitatively and quantitatively; we were limited to the selection given to us. This abbreviated selection yielded an analysis that was mostly described by those closest to reform. A comprehensive analysis that incorporates the voices and statistics of internal and external evaluations will better warrant a more holistic analysis of the outcomes against the theory of change.

2.10 Conclusion

The MSFC is reflective of the best practices in the field of education. It is unique due to its dual focus on the development of 21st century skills and vocational skills needed for students to participate as global citizens in today's fast-paced world. MSFC balances the head, heart, and hands of 21st century education, equipping

students with the skills necessary to engage in real world projects in collaborative and inclusive settings. Their authentic hands-on, student-centered approach in cultivating 21st century skills and vocational skills improves student employability, as well as attitudes towards school generally; beyond work and academia, the course reportedly impacts gender role perceptions, and encourages community service and labor. Key design features of MSFC are reflective of how this course can serve as a model for the intersection of vocational education with 21st century skills.

- **Connection.** MSFC students are at the heart of their learning because instructors have been encouraged to build relationships and connect them with their community, increasing their sense of belonging and ownership as global citizens (Aspen Institute, 2019).
- **Hands on Learning.** As evident through the MSFC, authentic learning of vocational skills and 21st century skills happen through hands-on opportunities, real-world applications, and community engagement (Deans for Impact, 2015).
- **Breadth of Skills.** Programs like the MSFC that build on the breadth of vocational and 21st century skills, beyond merely job training, increase student employability and empower students to navigate the ever evolving and interconnected world.
- **Instructor Capacity.** Building instructor capacity is essential to ensure the success of MSFC. Pre-service training, ongoing assessment, professional development, and integrated support mechanisms are at the heart of MSFC (Villegas-Reimers, 2003; World Bank, 2013).
- **Clear Expectations.** The use of a rubric intended to frame expectations for vocational instructors during the pre-service training encourages a high level of professionalism, reinforces program values, and provides a holistic guide on how to serve the hearts and minds of students (Liang et al., 2016; The World Bank, 2013).
- **Cultural Shifts.** Intentional pedagogical choices evident in the MSFC, such as group formation, as well as normalizing a breadth of skills, can facilitate cultural shifts, such as gender divides and roles (Reimers, 2020).

Indeed, while good evidence exists to suggest the MSFC has positive outcomes for students, further research on this course should be explored to provide insight to the mechanisms leveraged for niche reforms to move to scale across various states with integrity and to understand how to forge thriving and sustainable public-private partnerships.

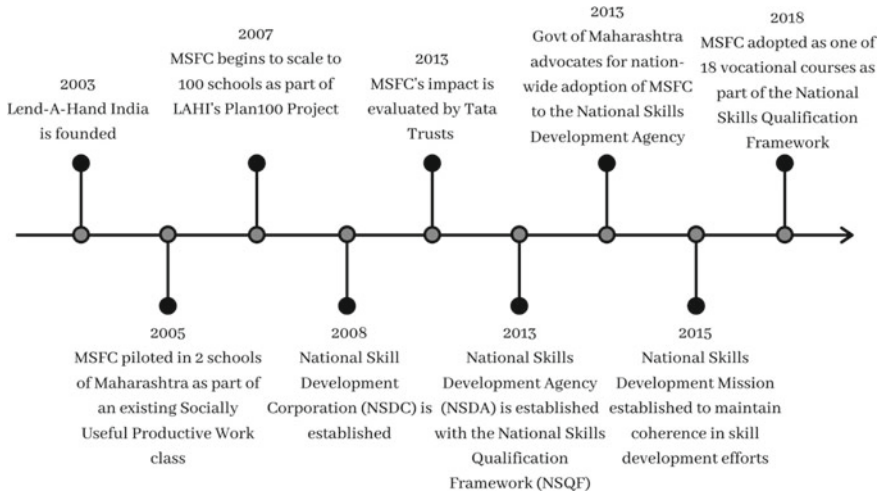


Fig. 2.1 A brief history of the MSFC

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Appendix A

Interviewees

Name	Role
Raj Gilda, Sunanda Mane	Co-Founders; Lend-A-Hand India
Sanket Patil, Nilesh Puradkar	Senior Program Officers; Lend-A-Hand India
Bhagyshree Kudale	Project Coordinator: Pune NSQF Team, Lend-A-Hand India
Sahil, Suyash, Prashant, Atharv, Sonali, Sharvari	MSFC Students
Nuru, Ganesh, Apurva, Pranjal, Vijay, Priyanka	MSFC Alumni
Anita, Sangameshwar, Srushti, Numara, Komal, Ganesh	Non-MSFC Vocational Students
Nitika, Siddhi, Pushkar P, Pushkar M	Non-Vocational Students

Information on students was removed to protect their identities.

Appendix B Survey Instrument

Sent through Google Forms and available in two languages for students

Background Information.

Gender	Male		Female		
Living situation	Small city	Town	Metropolitan city	Village	

I think the MSFC helped me

1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly disagree.

Learn to communicate with others	1	2	3	4	5
To think more creatively about problems	1	2	3	4	5
To present a topic to a group of classmates	1	2	3	4	5
To present a topic to a group of adults	1	2	3	4	5
Develop the ability to work with others as a team	1	2	3	4	5
Develop initiative and self-motivation	1	2	3	4	5
Develop my abilities as a leader	1	2	3	4	5
To learn to solve problems	1	2	3	4	5
To manage my stress	1	2	3	4	5
To manage my time	1	2	3	4	5
To become more confident	1	2	3	4	5

Because I took the MSFC in school:

1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly disagree.

I am more interested in my studies	1	2	3	4	5
I participate in class more	1	2	3	4	5
I am more regular in school	1	2	3	4	5
I don't feel like dropping out of school	1	2	3	4	5
I know about different career options I can take up	1	2	3	4	5
I know what I need to do to achieve my career goals	1	2	3	4	5

I think:

1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly disagree.

The course will help me in getting a job	1	2	3	4	5
This course helped me recognize there is a clear connection between what we are learning in school and the real world	1	2	3	4	5

Appendix C Focus Group Discussion Questions

MSFC

1. When did you take the MSFC?
2. Why did you choose MSFC?
3. What value did you think it would add to your life/career?
4. What were some things you thought you would learn from MSFC?
5. Why do you think some students did not choose MSFC in school?
6. What is unique about the MSFC in terms of how it is taught?
7. What has been your most impactful/memorable learning experience during MSFC?
8. Tell me about a project you did during the MSFC. What did you learn by doing the project? What opportunities did you have in class to build teamwork?
9. Apart from hard skills, is there something else you learnt about yourself?
10. How is your MSFC teacher different from other teachers?
11. How do you feel about working with the opposite gender? Has MSFC had anything to do with this?
12. How do you think the MSFC will affect your skills as an employee in the workforce?
13. Do you think the MSFC skills will help you in the future? How?
 - a. Ask specifically about the 21st century skills reflected in the MSFC (Communication, teamwork, working with other genders, presenting to adults, confidence, etc.).
14. What skills and mindsets do you think are important to succeed in life?
15. Do you think MSFC gave you any of these skills and mindsets? How?
16. Do you think working with hands is better or working in an office at a desk is better? Why?
17. If you could make MSFC better, what would you change about it?
18. How has MSFC impacted you and your community?
19. What did you learn from working on projects in the course?

Non-MSFC Students

1. Why do you think some students chose vocational subjects in school?
2. What vocational skill are you in and when did you take it?
3. Why did you choose this program?
4. Why did you not choose the MSFC?
5. What have you learnt from this program?
6. How are things taught?
7. (a) What has been your most impactful/memorable learning experience during Retail? (b) Tell me about a project you have done as part of Retail?

8. What did you learn by doing the project?
9. Apart from hard skills, is there something else you learnt about yourself?
10. According to you, which skills are required for entrepreneurship?
11. Does your program provide any of these skills?
12. How do you feel about working with the opposite gender? Has your program had anything to do with this?
13. How do you think the vocational program will affect your skills as an employee in the workforce?
14. Do you think the vocational program will help you in the future? how?
15. What skills and mindsets do you think are important to succeed in life?
 - a. Once they share, ask specifically about the 21st century skills reflected in the MSFC (communication, teamwork, working with opposite gender, presenting to adults, confidence etc.).
16. Do you think the vocational program gave you any of these skills and mindsets? How?
17. Do you think working with hands is better or working in an office at a desk is better? Why?
18. If you could make your program better, what would you change about it?
19. What opportunities did you have in class to build teamwork?

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