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MEASURING ENTREPRENEURIAL MINDSET IN YOUTH:

LEARNINGS FROM NFTE'S ENTREPRENEURIAL MINDSET INDEX

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Thomas Gold and Sophia Rodriguez

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For more information about NFTE's Entrepreneurial Mindset Index, please contact Sophia Rodriguez, Director of Research & Analytics, at Sophia.Rodriguez@nfte.com

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Entrepreneurial thinking has become a mantra for many programs and initiatives that aim to prepare young people for the future. This is because entrepreneurial skills—like the ability to take initiative and think on your feet, critically solve problems, and communicate effectively—are increasingly viewed as essential for career success.

But how do we know whether young people are acquiring these skills? Until now, there has been little research to guide efforts to assess entrepreneurial thinking in youth. In recent years, the Network for Teaching Entrepreneurship (NFTE) has been working to fill this gap by developing and testing the **Entrepreneurial Mindset Index** (EMI)—a tool to measure attitudes, behaviors and beliefs associated with being an entrepreneur. The EMI is currently in use with students in NFTE programs in schools across the United States and abroad. Our new paper, *Measuring Entrepreneurial Mindset*, presents findings on the utility, reliability and validity of the EMI, highlighting its potential as an innovative and effective assessmenttool in the entrepreneurship education landscape.

Why Entrepreneurial Mindset Matters

The paper begins by outlining several reasons for the growing focus on entrepreneurial mindset, including:

- A decline in entrepreneurship in the U.S. over the last several decades;
- Recognition that employers are actively seeking workers with entrepreneurial skills; and
- New research and policy initiatives underscoring the importance of noncognitive skills and social and emotional learning.

Developing the EMI

The paper describes NFTE's process for developing and piloting the EMI. It also presents the results of robust statistical analyses examining the EMI's reliability and validity. These analyses draw on responses from about 4,000 students across the country who took the EMI twice during the 2016-2017 school year (once near the beginning of NFTE's *Owning Your Future* entrepreneurship course and once near the end).

Overall, based on a variety of statistical tests, **the findings indicate that the EMI is a reliable and valid assessment tool to measure entrepreneurial mindset**. The version of the EMI that we tested included six constructs: future orientation, opportunity recognition, communication and collaboration, critical thinking and problem solving, comfort with risk, and creativity. All of these had high levels of reliability and internal consistency. We also found the six constructs to be collectively reliable and consistent—suggesting they are effectively measuring the broader concept of entrepreneurial mindset.

Early EMI Results: Exploring Changes in Entrepreneurial Mindset

The final section of the paper explores how students' entrepreneurial mindset changed during their participation in the NFTE course.* This analysis showed little difference between average pre and post scores, both overall and for each individual construct. But the averages masked a fair amount of variation in students' EMI scores: We found that roughly half of the students in the study experienced EMI growth, while the other half experienced a decline in their entrepreneurial mindset.

This variation allowed us to examine how changes in the EMI relate to growth in other, relevant entrepreneurial attitudes and behaviors. For this analysis, we relied on measures of entrepreneurial self-efficacy, entrepreneurship as an applied skill, and entrepreneurial intentions. We found that, compared to students who experienced a decline in entrepreneurial mindset, those whose entrepreneurial mindset improved:

- Are twice as likely to have growth in their entrepreneurial self-efficacy (i.e., 2.0 odds ratio);
- Are twice as likely to think about entrepreneurship as a skill that can be applied in any career (i.e., 2.0 odds ratio); and
- Have a 70 percent greater chance of wanting to own a business at the end of the course (i.e., 1.7 odds ratio).

We also wanted to understand whether the EMI was related to entrepreneurial knowledge. We found:

- The greatest gains in mindset happened in classrooms with the highest growth in entrepreneurial learning, while the lowest mindset growth occurred in the lower-performing classrooms.

Taken together, these findings indicate that **EMI scores are meaningful and related to other areas associated with entrepreneurial thinking and behavior**. This information is important for establishing the value and utility of the EMI. It also provides suggestive evidence that growing entrepreneurial mindset may have a positive effect in getting youth to see entrepreneurship and self-employment as a possible career path and something that can be learned and developed. Similarly, the results suggest that helping youth develop the entrepreneurial mindset may in fact increase their intentions to start a business.

More research is needed to further explore the conditions that promote EMI growth. We hope the current findings serve as a starting point for productive dialogue and additional exploration, as entrepreneurship education continues to flourish.

Entrepreneurial Mindset Index Domains
This paper explores the first six domains below, consisting of Likert Agreement Scale items. The other two domains in grey below consist of Situational Judgement Tests.

COMFORT WITH RISK	CREATIVITY & INNOVATION	CRITICAL THINKING & PROBLEM SOLVING	INITIATIVE & SELF-RELIANCE
COMMUNICATION & COLLABORATION	FUTURE ORIENTATION	OPPORTUNITY RECOGNITION	FLEXIBILITY & ADAPTABILITY

**Our dataset for these analyses included 3,661 students who took both the pre-and post-EMI in the 2016-2017 school year and who answered enough questions to generate an overall EMI mean score in both time periods.*

INTRODUCTION

Increasingly, the global economy demands that young people enter the workforce not only with a college degree, but also with a set of transferrable, *entrepreneurial* skills and attitudes that can help them succeed in almost any job or industry. This includes the ability to take initiative and think on your feet, to critically solve problems, and to communicate effectively. Learning these and other skills that are part of the [entrepreneurial mindset](#) is central to becoming career-ready. As a result, entrepreneurial thinking has become the mantra for many organizations interested in preparing youth for the future.

But how do we assess whether young people are acquiring these crucial skills? Until now, there has been little research to guide efforts to accurately measure entrepreneurial mindset. During the last several years, the Network for Teaching Entrepreneurship (NFTE) has been working to fill this gap by developing and testing the Entrepreneurial Mindset Index (EMI)—a tool to measure the attitudes, behaviors and beliefs associated with being an entrepreneur. The EMI is currently in use with students in the NFTE entrepreneurship program in schools across the United States and abroad. This paper presents new findings about the utility, reliability and validity of the EMI, highlighting its potential as an innovative, effective assessment tool in the entrepreneurship education landscape.

The paper is divided into three sections: (1) First, we set the stage by discussing why teaching and measuring entrepreneurial mindset matters. This section includes a description of NFTE's theory of change about how to activate the entrepreneurial mindset in youth. (2) Second, we describe the development of the EMI. This section presents the results of a robust statistical analysis examining the instrument's reliability and validity. (3) Finally, we explore how changes in students' entrepreneurial mindset, as measured by the EMI, appear to correlate with related measures of entrepreneurial attitudes, intentions and knowledge. This provides important evidence about the degree to which the EMI is indeed measuring something meaningful and relevant to entrepreneurship education.

As we describe below, the growing focus on teaching entrepreneurial skills stems from both clear needs in the economy and an expanded understanding of the skills young people need to succeed in school, work and beyond.

Nurturing Entrepreneurship

In recent decades, entrepreneurship – business startup – has been on the decline in the United States.[1] In the late 1980s, for example, new firms accounted for 13 percent of all businesses. Twenty years later, that number had dropped to 8 percent. The percentage of adults owning their own businesses has also dropped since the 1990s.[2] The decline in entrepreneurship is concerning not only because of its potential negative impact on new job growth but also because of its cultural significance. America was founded on the ideals of liberalism and the free market. At its best, America has welcomed people from all over the world and given them the opportunity to build new businesses from scratch and make big ideas a reality. The loss of entrepreneurship is the loss of something quintessentially American.

Building Skills that Employers Need

Despite the decline in actual startup activity, the skills associated with being an entrepreneur are increasingly critical to thrive in the 21st century economy.[3] Employers are actively looking for entrepreneurial workers—with skills like creativity, critical thinking and complex problem solving.[4] In fact, one in three employers polled in the United States said that they prefer hiring candidates with at least some entrepreneurial experience.[5] As a result, teaching entrepreneurial thinking should be seen as critical to strengthening human capital and making individuals more employable and competitive.[6]

Teaching Key Noncognitive Skills that Help Students Succeed

The focus on entrepreneurial mindset is consistent with a variety of other efforts in K-12 education to teach noncognitive skills and promote social and emotional learning (SEL).[7] As the authors of a 2015 Economic Policy Institute report explained,

> *"Broadly, these skills encompass those traits that are not directly represented by cognitive skills or by formal conceptual understanding, but instead by socio-emotional or behavioral characteristics that are not fixed traits of the personality, and that are linked to the educational process, either by being nurtured in the school years or by contributing to the development of cognitive skills in those years (or both)."* [8]

There is growing evidence that such skills can be critical for academic and career success. Various studies have demonstrated the impact of addressing noncognitive skills in the classroom. According to one widely cited meta-analysis, programs that focus on non-academic skills not only improved attitudes and behaviors, but also academic performance. The authors found that students participating in SEL programs showed an 11-percentile gain in academic performance compared with students in control groups.[9]

In response to this research, many states and school districts have begun to explicitly target noncognitive skills as part of their K-12 curricula. This trend was accelerated by the passage, in 2015, of the Every Student Succeeds Act, which provided states with more flexibility in how they understand student success and how they measure school quality. Similarly, a growing number of foundation initiatives and out-of-school programs are focused on building non-cognitive skills, including many that are part of the entrepreneurial mindset.

Advances in Entrepreneurship Education

For all of these reasons, entrepreneurship education has expanded in the United States and globally. Much of this growth has taken place at the college and university level, where the number of entrepreneurship majors and clubs has grown considerably over the last decade.[10] That said, there have been promising developments in entrepreneurship education at the K-12 level as well. For example, 84 percent of states currently report having K-12 standards, guidelines or proficiencies in entrepreneurial education, up from only 38 percent in 2009. Likewise, 36 percent of states require that high schools make entrepreneurial coursework available, up from 10 percent in 2009.[11]

We see similar trends outside of the United States. In 2016, the European Union unveiled the EntreComp framework, building off of the organization's identification of entrepreneurship as one of eight lifelong learning competencies—and one that is necessary for a knowledge-based society. The initiative, which promotes entrepreneurship education in schools, aims to "raise consensus among all stakeholders and to establish a bridge between the worlds of education and work."[12]

The Next Challenge: Effectively Measuring Entrepreneurial Mindset in Youth

As programs and courses in entrepreneurship proliferate, there are pressing questions about how to measure their outcomes. The goals of entrepreneurship education are not always the same for every program. Some aim to help participants create actual startups[13], while others are primarily geared toward the development of core skills associated with being an entrepreneur. These skills are relevant in a wide range of settings, across industries, including corporate *intrapreneurship*—that is, entrepreneurial activity that leads to innovation within large established organizations.[14] While programs vary, understanding and measuring how they influence the way students think—their mindset—is critically important for gauging success.

Researchers are just beginning to tackle the challenges of measuring entrepreneurial mindset and other noncognitive skills. These skills are difficult to assess because they do not represent a clear transfer of knowledge. Unlike with traditional academic areas like math or reading, measuring entrepreneurial mindset requires one to understand how a program influenced a student's "patterns of thought, feelings and behavior" and not just facts that they learned in a class.[15] Innovative assessment tools are needed.

A number of efforts have been made to develop assessments of entrepreneurial mindset.[16] One of the clear challenges that these assessments face is a lack of agreement about the definition of entrepreneurial mindset.[17] What is most relevant about how an entrepreneur thinks? While some identify the importance of comfort with ambiguity,[18] others are more focused on perseverance[19] or pro-activeness.[20] Many assessments look at a mix of both soft and hard skills, including information related to owning and running a business.

Most of these existing assessments are geared toward adults, including those that are already engaged in business and new ventures. Others are built to assess university students, including many focused on specific academic majors, like engineering or business. Few of these assessments are appropriate for youth in middle and high school because they focus largely on intent to start a business—whereas entrepreneurship education at the middle and high school level is mainly geared toward activating an interest in entrepreneurship and entrepreneurial thinking. One of the best efforts to develop an assessment of entrepreneurship education for school-aged youth has been the ASTEE project in Europe (ASTEE 2014).[21] NFTE's effort to develop an assessment of entrepreneurial mindset draws from many of the lessons learned from the ASTEE study. As outlined below, our work also relies on careful consideration of the short- and long-term student outcomes that NFTE's programs are designed to influence.

NFTE'S Theory of Change

NFTE is an internationally recognized nonprofit that strives to activate the entrepreneurial mindset in young people through programs in middle and high schools. Each year, NFTE serves over 20,000 students in the United States and another 40,000 abroad. NFTE's signature program, *Owning Your Future*, is a semester- or year-long course that teaches students the fundamentals of business startup through classwork, experiential exercises, engaging with volunteers and the development of a business plan.[22] At the end of the course, students are required to present their business plans to their class. Many NFTE students continue their interest in entrepreneurship and compete for prizes in business plan competitions sponsored by NFTE.

Figure 1 on the next page maps out the NFTE theory of change. As shown in the first part of the figure, over the course of our programs, students learn the fundamentals of business startup and entrepreneurship through classroom instruction, with a strong focus on experiential activities. This includes games, short projects and lessons that give students hands-on experiences and teach them concepts like recognizing opportunity, generating a profit, and marketing. The students also gain real-world experience by working closely with volunteers and mentors who are often business leaders from the community. These interactions help the students take the abstract concepts they are learning in the classroom and see how they function in the real world.

As shown in the second part of the figure, these program activities are expected to help students develop their entrepreneurial mindset and begin thinking like an entrepreneur. This becomes stronger toward the end of program as they complete their business plan and present it to their class and, for many students, to external juries at regional and national business plan competitions.

The third part of the figure shows that when students have developed the entrepreneurial mindset, it leads to other changes in attitudes and behavior, including promoting a more positive disposition toward business startup and entrepreneurship. Previous studies have demonstrated the connection between entrepreneurship education and intentions to start a business.[23] We also expect that students begin to view entrepreneurship as a possible career choice.[24]

Finally, as shown in the last section of the figure, changes in students' attitudes and behaviors are expected to support their ability to start a business or otherwise demonstrate career success. We have strong suggestive evidence from previous research that students who have participated in the NFTE program are more likely than others to become business owners: A 2017 study found that 25 percent of NFTE alumni reported starting their own business. This is over ten times the national average for youth businesses in the United States and more than twice the overall national average.[25]

Utilizing data from NFTE's core program, *Owning Your Future*, this paper focuses on the intermediary steps in our theory of change: the relationship between entrepreneurial mindset activation and entrepreneurial attitudes and behaviors. Before we present those findings, however, we describe the development of our Entrepreneurial Mindset Index as well as the results of our analysis of its reliability and validity.

Figure 1. NFTE's Theory of Change: How Teaching the Entrepreneurial Mindset Supports Student Success

Focus of this Paper

Entrepreneurial Education

- Knowledge of business startup fundamentals
- Experiential/ project-based learning
- Business ideation
- Creation of business plan (individually/ in a team)
- Development and presentation of business pitch
- Feedback and support from business professional

Entrepreneurial Mindset Activation

- Positive growth in mindset at the end of NFTE as measured by NFTE's EMI instrument

Entrepreneurial Attitudes and Behaviors

- Perspective of entrepreneurship as a possible career
- Perspective of entrepreneurship as a skill that can be applied to other careers
- Entrepreneurial intent
- Career readiness

Entrepreneurial Actualization and Career Success

- Actualization of business start-up
- Employment rate
- Career success
- Career satisfaction

Deciding What to Measure

In 2014, NFTE started in earnest the process of developing an assessment of entrepreneurial mindset for youth. Leading up to this moment, NFTE had identified the development of entrepreneurial mindset as a major goal of the organization, in part from a realization of the importance of developing these skills to prepare students for the 21st century workforce. In addition, earlier studies of NFTE had highlighted the program's ability to affect noncognitive skills, such as students' internal locus of control.[26] This evidence helped drive a focus on entrepreneurial mindset as a primary programmatic outcome.

As a first step in the development of the EMI, we had to define the concept we were trying to measure. What is entrepreneurial mindset? How do we know when a student has "learned" it? Can it, in fact, be learned? During the first phase, we identified eight key skills, attitudes and behaviors that the EMI should assess:

- future orientation
- comfort with risk
- opportunity recognition
- flexibility and adaptability
- initiative and self-reliance
- creativity and innovation
- critical thinking and problem solving
- communication and collaboration

To identify these key domains—that is, the constructs we sought to measure—we reviewed the literature on entrepreneurship education, 21st century skills, noncognitive factors, social and emotional learning, and character education. We also conducted interviews and focus groups with staff, teachers, students, alumni and other stakeholders to understand outcomes that were most closely associated with the NFTE program. In addition, we looked for opportunities to align potential EMI domains with existing competencies identified by the Collaborative for Academic, Social, and Emotional Learning (CASEL), the National Research Council (NRC), and the Cognitive Ability or Big 5 Personality traits.

During this early period, we decided that the assessment should focus more on softer skills, like communication and problem solving, which led us to eliminate some domains that had been selected earlier, like financial and digital literacy. While we saw these skills as important to entrepreneurship and business startup, we wanted the assessment to address essential cross-cutting noncognitive skills as much as possible.

In June 2014, we convened a working group of top researchers in the fields of entrepreneurship, psychology, education policy, and education technology to discuss the development of an assessment of entrepreneurial mindset. Key findings from the meeting included an affirmation of the importance of developing entrepreneurial mindset in youth as a core programmatic goal for NFTE. In addition, there was a clear agreement from the group that in order to measure entrepreneurial mindset, we needed to identify innovative assessment approaches. Finally, attendees felt that the information from the assessment should be used not just for the purposes of program evaluation, but also to provide formative feedback that could inform and strengthen instruction.

In response to the working group's focus on innovative assessment approaches, we initiated a collaboration with the Educational Testing Service (ETS) in late 2014. This collaboration allowed us to finalize the assessment constructs, develop survey items (i.e., questions) to measure them, and begin to analyze results from piloting the assessment. The ETS team brought expertise not only in psychometrics and education research, but also in assessments of noncognitive factors and workforce development skills. The same team from ETS had worked on a similar project to develop another noncognitive assessment—the Mission Skills Assessment (MSA)—that is now in wide use in private, independent schools.[27]

Developing and Piloting Items

After finalizing the assessment constructs, we worked with ETS to draft assessment items during the spring and summer of 2015. During this initial phase, we developed over 80 items, including mostly Likert type (agreement scale) and biographical questions ("I have presented an idea in front of my class during the last month").[28]

As part of the development of Likert items, the ETS team conducted "cognitive labs" with NFTE students during our summer Bizcamps in New York City in 2015. A cognitive lab is a method to study the mental processes one uses when completing a task, which in this case was answering draft assessment items. During the labs—which involved 11 NYC high school students from low-income backgrounds—participants were asked to answer questions and then discuss their responses. This process allowed us to change language in some of the items that students found confusing or unclear.[29] It also helped us address other issues like poor choice of words, culturally specific phrases and bad grammar, all of which can influence item responses.

We finalized the items and then piloted the EMI during the 2015-2016 school year with around 1,000 students participating in NFTE's Owning Your Future course in about 15 NYC public high schools. In total, 73 Likert items were piloted with students in the fall and spring of the school year. In addition, 14 Situational Judgement Tests were piloted during this phase.[30]

The assessment was administered online. Student responses were secure and largely anonymous. (They provided a self-created key using information like their birthdate, first few letters of their mother's maiden name, first characters of street address, etc.). This latter step was done to match pre- and post-tests, where needed.

This initial pilot was conducted mainly to begin to assess the reliability of the different constructs and to reduce the number of items. Based on the initial round of testing, we were able to cut the number of Likert items from 73 to 30, as many questions proved to be redundant. In addition, we were able to determine that the six constructs that used Likert items were internally consistent, meaning that individual students on the whole responded similarly to items that fall within the same domain. We selected these constructs—future orientation, opportunity recognition, communication and collaboration, critical thinking and problem solving, comfort with risk, and creativity—to roll out in the fall of 2016.[31]

To address the remaining two constructs (flexibility and adaptability, initiative and self-reliance), we had used the more experimental Situational Judgement Tests. However, these items did not hold up in our first round of testing. Subsequently, we rewrote these items in collaboration with teachers for use in the 2017-2018 school year. Those results are still in the process of being analyzed for a separate study. The rest of this paper addresses the results of the six reliable constructs that were piloted in all NFTE schools during the 2016-2017 school year.

Assessing the EMI's Reliability and Validity

This paper uses results from about 4,000 students with matched data (i.e., students who both took our pre- and post-EMI). The EMI was administered to all participants in NFTE's *Owning Your Future* entrepreneurship course in 2016-2017. Similar to the pilot test the previous year, the EMI was administered near the beginning and end of the course—either in the fall and spring (for students taking the year-long course) or early and late in a single semester (for those taking the one-semester course).

As noted above, this paper focuses on the six constructs that had been previously identified as reliable with items that demonstrate internal consistency. Figure 2 on the next page lists the definition and number of items for each of these six constructs, along with corresponding sample items from the EMI.

Similar to other efforts in entrepreneurship education to measure mindset (e.g., ASTEE 2014), we employed structural equation modeling (SEM) as our umbrella statistical technique. We use SEM to determine how the items are related to the six constructs[32] we defined to make up the entrepreneurial mindset. SEM is a popular method for behavioral researchers to measure what are called latent constructs or factors that are theoretical in nature but not directly observable. SEM helps us understand whether a set of observed variables—that is, the questions or items that we ask the respondents—are correlated to the theoretical constructs that we are interested in measuring.[33] Utilizing a variety of techniques, from confirmatory factor analysis (CFA) models to regression models, SEM enables us to assess whether questions within each construct are reflective of their respective EMI domain and whether they can hold together statistically as an "overall model" to measure entrepreneurial mindset.

**Figure 2.
EMI Domains
and Sample Items**

Construct	Definition	Number of Items	Sample Item (Strongly Disagree – Strongly Agree)
OPPORTUNITY RECOGNITION	The practice of seeing and experiencing problems as opportunities to create solutions	6	When I am presented with an opportunity that I believe is good, I take it.
COMFORT WITH RISK	The capacity to move forward with a decision despite inevitable uncertainty and challenges	4	I pursue activities that are outside of my comfort zone.
CREATIVITY & INNOVATION	The ability to think of ideas and create solutions to problems without clearly defined structures	4	I enjoy thinking of new ideas.
FUTURE ORIENTATION	An optimistic disposition with a focus on obtaining the skills and knowledge required to transition into a career	7	I work hard now to be successful later.
CRITICAL THINKING & PROBLEM SOLVING	The process of applying higher-level, process-oriented thinking skills, and of transitioning that applied reasoning to support decision making	6	I enjoy finding solutions to problems that I have.
COMMUNICATION & COLLABORATION	The ability to clearly express ideas to an intended audience, including persuading others to work towards a common goal	3	When working in a group, I make sure everyone participates.

In this paper, we focus primarily on using CFA models to test the following assumptions:

- The six individual constructs as well as the overall EMI model hold together statistically for the pre-EMI and post-EMI (model fit).
- The six constructs and the EMI are consistently measuring similar constructs over time (reliability).
- The questions within the six constructs are reflective of that construct overall, and collectively, are statistically related to an overall theoretical model of entrepreneurial mindset (internal consistency and convergent validity).
- The six constructs are not reflecting other constructs not included in the model (discriminant validity).
- Different groups of students approach the questions similarly (measurement invariance).

Below, we provide the results of our analyses, which include the relevant estimates alongside the recommended ranges of the statistical tests. Overall, **the findings establish the EMI as a consistent and valid assessment tool to measure entrepreneurial mindset**.

All six of the constructs tested had high levels of reliability and internal consistency based on relevant tests. In particular, they all exceeded the recommended Cronbach's alpha and composite reliability cut-off of 0.70. We also found the six constructs to be collectively reliable and consistent, which was important for our later analyses that examined overall EMI scores. We were unfortunately unable to establish discriminant validity for all of the constructs. Particularly, there seemed to be a high correlation between the Creativity and Innovation and Critical Thinking and Problem Solving constructs, as well as the Creativity and Innovation and Opportunity Recognition constructs. This is most likely the result of actual similarities between these three constructs and what they are attempting to measure. In the end, the overall EMI model emerged with a good statistical fit based on a number of indices. See Table 1 for an overview of the analyses of our pre-EMI and Appendix A for details.

Model Fit, Reliability, Internal Consistency, Convergent and Discriminant Validity

Table 1 provides a detailed description of our model fit indices as well as estimates that detail reliability, internal consistency, and convergent and divergent validity. (Table 1 presents findings from the post-test EMI. We conducted this analysis for both the pre- and post-test. Findings from the pre-test are similar and presented in the Appendix A.)

Table 1. Reliability, Internal Consistency, and Model Fit of Post-EMI (Six Constructs)

	Post-EMI				# Items
	Alpha	**CR**	**AVE[1]**	**Highest Covariance**	
COMMUNICATION & COLLABORATION	0.76	0.72	0.52 (.72)	0.76	3
CRITICAL THINKING & PROBLEM SOLVING	0.91	0.89	0.66 (.81)	0.88	6
CREATIVITY & INNOVATION	0.87	0.85	0.65 (.81)	0.84	4
OPPORTUNITY RECOGNITION	0.89	0.87	0.59 (.77)	0.84	6
COMFORT WITH RISK	0.88	0.86	0.69 (.83)	0.72	4
FUTURE ORIENTATION	0.93	0.91	0.66 (.81)	0.78	7
EMI Overall	0.97	0.97	0.63 (.79)		30

Post-EMI model fit indices: x^2 = 6509.99 (df: 390), RMSEA = .064(.063;.065); CFI = .976; TLI = .973; SRMR = .035

[1]The square root of AVE is presented within paratheses.

Notes: Recommended cut-offs for high-quality measures are as follows:
- Cronbach's alpha 0.70 or greater
- Composite reliability (CR) 0.70 or greater
- Average value extracted (AVE) values of 0.50 or greater (Fornell and Larcker 1981, Nunnally and Bernstein 1994)

Measurement Invariance

We conducted measurement invariance analyses to understand how different subgroups of students, in terms of ethnicity, gender, grade level and course requirement, approached the EMI questions. These tests help us determine if there is any bias in the way we have framed the questions that would impact the results. Our analysis found that students in the sub-groups interpreted the questions for the six constructs similarly in both the pre- and post-EMI tests. This was the case even in the most rigorous invariance testing that we had applied. See Appendix A for more details.

The previous section detailed the statistical testing of the EMI, including tests examining the instrument's reliability, validity and measurement invariance. Overall, these analyses confirm that the EMI is measuring the six constructs consistently and accurately. The final section of this paper begins exploring results from the EMI in 2016-2017, looking at how students' entrepreneurial mindset changed between the pre- and post-tests. This allows us to then examine how changes on the EMI relate to growth in other, relevant entrepreneurial attitudes and behaviors.

This analysis is key to establishing "nomological" validity, an approach that is used to help establish the meaningfulness of unobservable constructs by linking them with measures that share a theoretical connection. In this case, we hypothesized that the greatest growth in entrepreneurial mindset would be in classrooms with the highest levels of entrepreneurship knowledge learning. While these analyses are exploratory in nature, we believe they are an important way to establish the value and utility of this innovative assessment.

About the Sample

Our dataset for these analyses encompasses 3,661 students in NFTE's signature entrepreneurship course who took both the pre- and post-EMI in the 2016 – 2017 school year and who answered enough questions to generate an overall EMI mean score in both time periods.[34] In addition to the EMI, we also collected a host of data that we used for our analyses. Table 2 on the next page describes the sample, including demographics, level in school, home state and other characteristics.

We utilize demographic and course variables as controls in our regression analysis. We also incorporate the fixed effects of the different states for each of the NFTE programs. As you see in the table, the EMI was administered in NFTE programs in 14 different states, including the District of Columbia. We include these fixed effects in the model to control for heterogeneity in education policies—which can vary considerably from state to state, potentially impacting the way the program is implemented. When we analyzed changes in the entrepreneurial mindset among the students in our sample, we found little difference between average pre and post scores—both overall and within each of the domains (see Figure 3 on page 14).

But these averages masked a fair amount of variation in students' scores. As shown in Figure 4 on page 15, roughly half of the students indicated a positive mindset change, while the other half indicated a negative mindset change. There are several potential factors that account for this even split in mindset change, the most logical being variation in the implementation of the NFTE program. While this paper does not go into the factors behind the variation, the relatively even distribution of students with mindset growth and decline presented us with an opportunity: Specifically, it allowed us to use these two categories of students as subgroups and compare whether they varied in terms of their entrepreneurial attitudes, behaviors and knowledge.

Thus, our approach in the following section is to examine the correlation between mindset growth and other areas of change that would be consistent with NFTE's theory of change. Our study does not utilize a comparison or control group of students who did not participate in the NFTE program. Rather, we focus on the differences between students who demonstrate mindset growth compared to those who show mindset declines.

Table 2. Descriptive Statistics for the Sample

			State	
Male	52%			
Female	48%		CA	24%
Hispanic	38%		CT	7%
Black	36%		DC	1%
White	13%		DE	2%
Asian	12%		FL	15%
Other	0%		IL	1%
Not U.S. Born	13%		MA	5%
U.S. Born	87%		MD	17%
Entrepreneur Family Member	49%		MO	2%
No Entrepreneur Family Member	51%		NJ	1%
Middle School	13%		NY	14%
High School	87%		PA	2%
Elective	64%		TX	8%
Required	36%		VA	2%
Standalone	62%			
Embedded (e.g., in a Business course)	38%			
Full Year	71%			
Semester	29%			

Figure 3. Entrepreneurial Mindset Index Results, 2016-2017

In the above portion of the figure, purple and orange circles indicate pre and post scores. The bar graph displays change in scores between pre and post in each of the six constructs: comfort with risk, communication and collaboration, critical thinking and problem solving, future orientation, creativity and innovation, and opportunity recognition, respectively.

Figure 4. Distribution of Entrepreneurial Mindset Change between Pre and Post
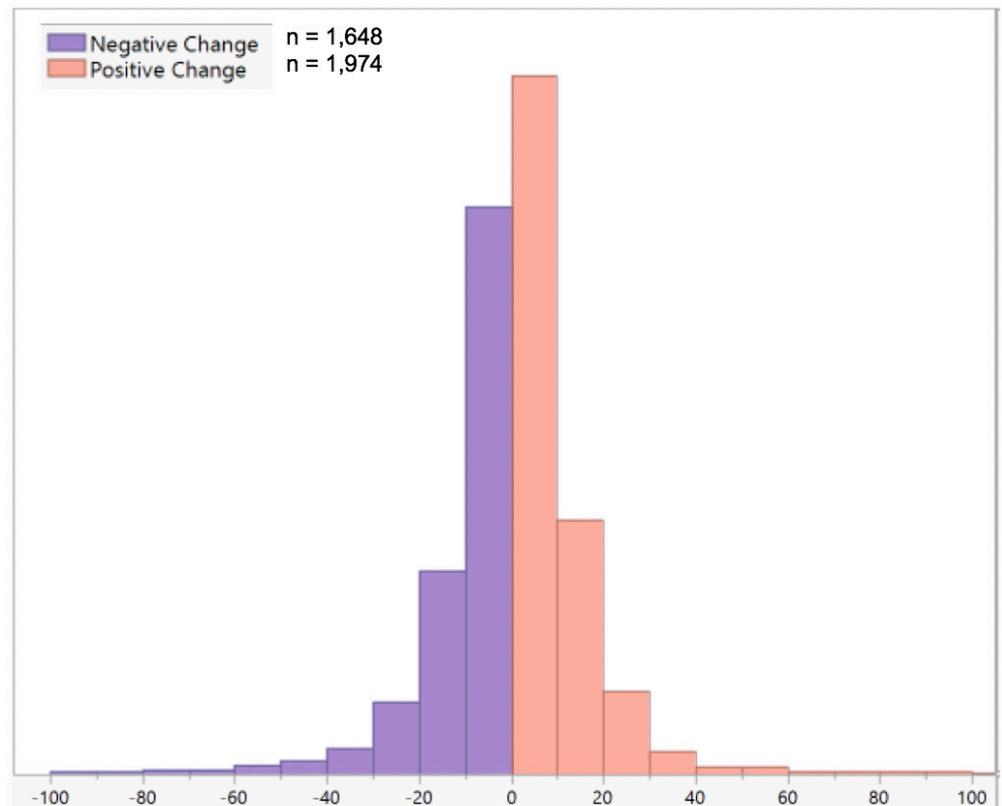
Analytic Approach

For this section, we used a variety of regression analyses—Ordinary Least Squares (OLS), Logistic, and Analysis of Variance (ANOVA), depending on whether our dependent measure was ordinal, binary, or categorical, respectively. Our primary model compared those who grew their mindset with those who did not, while controlling for a range of other factors, including their EMI score at the beginning of the course, their demographics, school and classroom. This model treated our EMI change measure as a binary independent variable for our OLS and Logistic regressions (see Model 1 below). Students were coded as "1" if they had some level of positive change in their EMI mean score between the beginning and end of the NFTE course, and "0" if they had some level of negative change; there were a negligible number of students with static scores, which were omitted. We also wanted to explore whether EMI changes were associated with changes in entrepreneurial knowledge. To do so, we used ANOVA analyses, in which students' EMI mean change scores were analyzed as a dependent variable, with the primary independent variable being whether they were in classes displaying low, moderate or high levels of learning in entrepreneurial knowledge (see Model 2).

Model 1.

$$Y_{is} = \beta_1(\text{EM Change Binary})_{is} + \beta_2(\text{Pre})_{is} + \beta_3(\text{Dems})_{is} + \beta_4(\text{Course})_{is} + a_i + u_{is}$$

Model 2.

$$Y\,(\text{EM Change Mean})_{is} = \beta_1(\text{Group})_{is} + \beta_2(\text{Pre})_{is} + \beta_3(\text{Dems})_{is} + \beta_4(\text{Course})_{is} + a_i + u_{is}$$

In both models:

- Pre represents the mean EMI score of the student at the beginning of the course to account for student-level variation in their entrepreneurial mindset at the outset. Additionally, we included a student's response to the entrepreneurial and career attitude/behaviors at the beginning of the NFTE course in our inference analyses to establish a baseline model.

- Dems represents student-level characteristics, including ethnicity, gender, whether the student is an immigrant, and whether the student has a close family member who is an entrepreneur.
- Course represents course-level characteristics, including whether the NFTE course was a full year or semester, required or elective, standalone or embedded into another course (such as Business), and whether the course was implemented at a high school or middle school.
- a_i is the state-invariant fixed effects to account for any unobserved variation in NFTE courses due to heterogeneity in state education policies.
- u_{is} is the error term

Previous entrepreneurship education studies have used similar demographic and course controls, establishing them as important covariates to include in such analyses (e.g., Moberg 2012, Hayes and Richmond 2017).

We conducted goodness of fit tests as well as checked for multicollinearity in all of our models. We also conducted additional sub-group analyses that examined students who changed their attitudes and behaviors in these different categories, from negative to positive during the NFTE course, compared to students who went from positive to negative or students who remained static in their negative attitudes and behaviors.[35]

How Do EMI Scores Relate to Other Relevant Entrepreneurial Attitudes and Behaviors?

This section explores how EMI scores are related to other factors that are relevant and important to entrepreneurship and entrepreneurial thinking. For this analysis we relied on established measures of entrepreneurial self-efficacy, entrepreneurship as an applied skill, and entrepreneurial intentions. All of these measures have been used in other studies of entrepreneurial thinking.[36]

Entrepreneurial Self-Efficacy (ESE) refers to an individual's belief that they have the knowledge and skills to start their own business.[37] Our measure of ESE was captured by a separate Likert agreement scale item ("I feel I have the skills and knowledge required to start a new business"). We focused on ESE growth over the course of the NFTE experience, as we were most interested in understanding whether growth in ESE was related to growth in entrepreneurial mindset.

The focus on self-efficacy in entrepreneurship research is based on the work of Bandura, whose social cognitive studies looked at how individuals assessed their own "competencies and ability to overcome adverse conditions and obstacles and the belief that future actions will be successful".[38] These beliefs in turn affect "what challenges to undertake, how much effort to expend on the endeavor (and) how long to persevere in the face of difficulties."[39]

Entrepreneurship as an Applied Skill measures students' self-report of whether they feel that entrepreneurship is a skill that can be used in any career.[40] We asked this item as part of a broader question about students' views of entrepreneurship. When assessing this relationship, we looked at both how students answered the item at the end of their NFTE experience, as well as the sub-group of students who changed from not feeling that entrepreneurship was an applied skill at the beginning of their course to feeling that it was an applied skill at the end of it.

Entrepreneurial Intention measures students' self-report of whether they would like to own their own business.[41] When assessing this relationship, we looked at both how students answered the item at the end of their NFTE experience, as well as the sub-group who changed from not wanting to own a business at the beginning of their course to wanting to own a business at the end of it.

We found that, compared to students who experienced a decline in entrepreneurial mindset, those whose **entrepreneurial mindset improved:**

- **Are twice as likely to have positive entrepreneurial self-efficacy (ESE) growth (i.e., 2.0 odds ratio).**

- **Are twice as likely to think about entrepreneurship as a skill that can be applied in any career (i.e., 2.0 odds ratio).**

- **Have a 70 percent greater chance of wanting to own a business at the end of the course (i.e., 1.7 odds ratio).**

EMI and Entrepreneurial Self-Efficacy

We used ESE to help validate the growth measure of the EMI. This relationship is important to establishing predictive validity of the EMI. Given the prevalence of ESE in entrepreneurship and entrepreneurship education studies, it is important to know whether students' growth in mindset is closely related to their growth in self-efficacy. We theorize that students' confidence in their entrepreneurial ability is tied to their exposure to entrepreneurship due to the experiential nature of NFTE, which in turn is related their entrepreneurial mindset. Our theory is that this belief in one's own capacity is based on a self-assessment of their past experiences and knowledge and is, in the end, a measure of their readiness to perform that task.

In our analyses, we found a significant relationship between growth in entrepreneurial mindset and growth in ESE (see Appendix B). Students who experienced a positive entrepreneurship change between the beginning and end of NFTE had almost a half-point increase in their ESE six-point scaled measure, controlling for our pre-EMI measure, demographic and course covariates, as well as incorporating state fixed effects. This association was statistically significant, supporting our theory that EMI growth and ESE growth are related.

When analyzing ESE as a binary construct (1 = positive growth between beginning and end of NFTE, 0 = negative growth), we found that students with a positive entrepreneurial mindset had twice the odds of having positive ESE growth, which was a statistically significant relationship.[42]

EMI and Entrepreneurship Attitudes and Intentions

Students who show positive growth in their entrepreneurial mindset have twice the odds of thinking about entrepreneurship as a skill that can be used in any career at the end of NFTE, controlling for their views at the beginning of the course, their mindset at the beginning of the course, as well demographic and course controls and fixed effects (see Appendix B). This relationship between positive mindset growth and positive entrepreneurial attitude is statistically significant.

Additionally, positive growth in entrepreneurial mindset is also a predictor for students who experience a change in their attitude toward entrepreneurship as an applied skill. Compared to students who demonstrate a negative mindset change, students who grow their mindset have statistically significantly greater odds of changing their belief that entrepreneurship is a skill that can't be used in any career to believing that it can. (see Appendix B).

Finally, changes in entrepreneurial mindset may also lead to students having the intention to start a business[43]. Students who show positive growth in their entrepreneurial mindset multiply their odds of wanting to own a business by 1.7 at the end of NFTE, controlling for their views at the beginning of the course, and including relevant covariates and fixed effects (see Appendix C).[44] We believe that the relationship between EMI change and entrepreneurship attitudes and intentions are critical in helping validate the EMI as a tool that is relevant to the entrepreneurship education landscape.

How Do EMI Scores Relate to Entrepreneurship Knowledge?

While the above analyses suggest that there is a correlation between entrepreneurial mindset and entrepreneurial behaviors and attitudes, we also wanted to understand whether the EMI was related to other measures of entrepreneurship and, in particular, entrepreneurial knowledge. **Entrepreneurial knowledge** was based on a 27-item cognitive assessment administered to NFTE students. Because the data lacked an identifying variable that would have connected the EMI and entrepreneurial knowledge scores, we used classroom mean knowledge scores instead. We were able to collect both the change in knowledge scores between the beginning and end of NFTE, as well as the knowledge scores at the end of the course. We calculated z scores with the classroom-level mean scores to create four classroom-level ranks, where 1 signified classrooms with the highest levels of entrepreneurship learning and 4 signified the lowest levels of entrepreneurship learning.

We found:

- **The greatest gains in mindset happened in classrooms with the highest growth in entrepreneurial learning, while the lowest mindset growth occurred in the lower-performing classrooms.**

Our theory was that students in classrooms with higher average gains in entrepreneurial knowledge would experience a commensurate increase in their entrepreneurial mindset. This is not because entrepreneurial learning is necessarily an antecedent to entrepreneurial mindset. Rather, our theory rests on the assumption that students in these higher-performing classrooms were in fact experiencing better, more effective instruction, most likely by a more effective teacher, and therefore receiving a stronger "dosage" of entrepreneurship training.

In keeping with this theory, we found that the highest mindset growth occurred in classrooms with the highest level of entrepreneurship knowledge learning. Likewise, we found the lowest mindset growth—in fact, declines in mindset—in classrooms with the lowest performance on the entrepreneurship knowledge assessment. The difference between these EMI changes was statistically significant and included all our controls and state fixed effects (see Appendix D). Figure 5 presents these results.

Figure 5. ANOVA Fitted Values Model of EMI Change Scores by Classroom Entrepreneurship Knowledge Assessment Levels (Lowest Level = 1, Highest Level = 4)
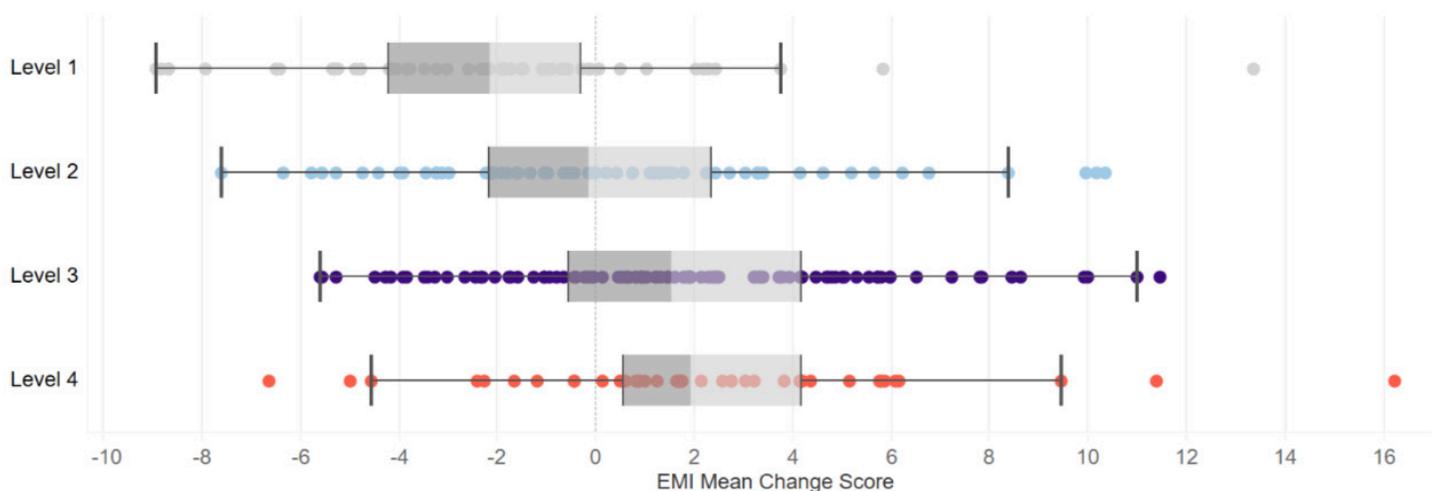
$F_{(14, 2778)} = 39.98, p < 0.01$

The analysis yielded identical results when we looked at the classrooms' average change in knowledge scores between the beginning and end of NFTE. The summative scores at the end of the year helped establish classes that had grasped the most entrepreneurship knowledge. The change scores helped account for the variation in student and teacher ability and classroom contexts.

These results further help us establish the validity of the EMI assessment. They demonstrate that the EMI scores increase in contexts where we would expect it to—in this case, when students are in a high-quality classroom setting.

CONCLUSIONS

The results of this study help establish the EMI as a valid and reliable instrument to measure entrepreneurial mindset. The findings show not only that the EMI can reliably measure six different aspects of entrepreneurial mindset, but that this measure is meaningful and related to other areas associated with entrepreneurial thinking and behavior, particularly entrepreneurial self-efficacy and entrepreneurial knowledge. These findings provide suggestive evidence that growing entrepreneurial mindset may have a positive effect in getting youth to see entrepreneurship and self-employment as a possible career path and something that can be learned and developed. Similarly, the results suggest that helping youth develop the entrepreneurial mindset may in fact increase their intentions to start a business.

While the intentions do not necessarily translate directly into action, they provide a potential for more entrepreneurship and entrepreneurial behavior. And NFTE's own experience shows that providing entrepreneurship education to middle and high school students has the potential to lead to more enterprising behavior.

More research is needed to further explore the conditions that promote EMI growth. We are particularly interested in examining the impact of NFTE's program on students' mindsets and other attitudes, beliefs and behaviors, using a rigorous experimental or quasi-experimental approach that employs a suitable comparison or control group. We also want to design studies that explore the other aspects of NFTE's theory of change around the entrepreneurial mindset, especially those that help us better understand the antecedents to mindset growth.

As entrepreneurship education flourishes in schools and universities, additional research and evaluation have a crucial role to play in developing effective programs. We hope these findings serve as a starting point for productive dialogue and further exploration.

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Model Fit, Reliability, Internal Consistency, Convergent and Discriminant Validity

Table 1 in the text and Table A-2 below provide a detailed description of our model fit indices as well as estimates that detail reliability, internal consistency, and convergent and divergent validity.

Notable highlights from this analysis include the following:

- We were able to replicate findings from the testing phase, which showed that the EMI's constructs had high levels of reliability, internal consistency, and convergent validity. Our constructs exceeded the recommended Cronbach's alpha and composite reliability (CR) cut-off of 0.70 and average value extracted (AVE) values of 0.5.[45]

- The only exception to this was our communication and collaboration domain in the pre-EMI, which has the fewest number of items (three). However, even this construct improved to the acceptable threshold of internal consistency in the test of the post-EMI assessment.

- We also found the six constructs collectively to be reliable and internally consistent, as assessed by Crobach's Alpha and the Fornell and Larcker recommended values. This is important given that our later analysis examines overall EMI scores, instead of focusing on the six constructs individually.

- We were unable to establish discriminant validity across our constructs as the co-variance between constructs was fairly high. To evaluate discriminant validity, we used Fornell and Larcker's method of comparing the square root of AVE values with the highest correlation between constructs. In particular, there seemed to be a high correlation between the Creativity and Innovation and Critical Thinking and Problem Solving constructs, as well as the Creativity and Innovation and Opportunity Recognition constructs.

- Finally, the overall EMI model—which considers the six constructs jointly—was also a good statistical fit, further supporting our decision to analyze the average entrepreneurial mindset score overall instead of looking at the six constructs separately. We determined model fit using the fit indices laid out by Hu and Bentler (1998, 1999); our comparative fit index (CFI) and Tucker Lewis Index (TFI) were above .90, and our root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) were below 0.08. We also include chi-square estimates with the caveat that chi-square is sensitive to large sample sizes.

Table A-1. Reliability, Internal Consistency, and Model Fit of Pre-EMI (Six Constructs)

	Pre-EMI				# Items
	Alpha	CR	AVE[1]	Highest Covariance	
COMMUNICATION & COLLABORATION	0.68	0.64	0.42 (.65)	0.76	3
CRITICAL THINKING & PROBLEM SOLVING	0.87	0.84	0.55 (.74)	0.91	6
CREATIVITY & INNOVATION	0.81	0.80	0.55 (.74)	0.88	4
OPPORTUNITY RECOGNITION	0.85	0.81	0.49 (.70)	0.90	6
COMFORT WITH RISK	0.83	0.82	0.62 (.79)	0.80	4
FUTURE ORIENTATION	0.91	0.88	0.60 (.77)	0.82	7
EMI Overall	0.95	0.95	0.55 (.74)		30

Pre- EMI model fit indices: χ^2 = 6109.56 (df: 390), RMSEA = .062(.060;.063); CFI = .949; TLI = .944; SRMR = .04

[1]The square root of AVE is presented within paratheses.

Notes: Recommended cut-offs for high-quality measures are as follows:
- Cronbach's alpha 0.70 or greater
- Composite reliability (CR) 0.70 or greater
- Average value extracted (AVE) values of 0.50 or greater (Fornell and Larcker 1981, Nunnally and Bernstein 1994)

Measurement Invariance

As noted in the text, we conducted measurement invariance analyses to understand how different subgroups of students, in terms of ethnicity, gender, grade level and course requirement, approached the EMI questions. These tests help us determine if there is any bias in the way we have framed the questions that would impact the results.

In this analysis, we applied three different levels of testing: configural, weak, strong. Each level builds on the previous one, adding additional constraints on model parameters to achieve strong forms of invariance at each stage. Each stage is essentially testing increasingly restrictive hypotheses and further establishing the measurement consistency of the different constructs.[46]

We noticed that some of our tests showed statistical differences for a few sub-groups as assessed by chi-square (i.e., the chi-square statistic became significant from the configural to weak or from weak to the strong invariance test). However, the changes in the CFI and RMSEA indices suggested that the model was overall invariant between

sub-groups. Given that CFI and RMSEA have been recommended to assess model fit in large sample sizes, we place greater emphasis on these model fit indices as well as the changes of these indices between sub-groups.[47]

Tables A-2 – A-5 provide the model fit indices for all the sub-groups that we assessed for measurement invariance in both the pre and the post-EMI. Generally, these tables show that students are interpreting the EMI questions similarly, and that their responses are not affected by their ethnicity, gender, grade level, or course status.

Table A-2. Measurement Invariance Testing for Ethnicity

Test	DF	χ2	Δ χ2 p	CFI	Δ CFI	RMSEA	Δ RMSEA
PRE							
Configural	1560	5941	-	0.918	-	0.045	-
Weak	1632	6067	<0.001	0.917	0.001	0.045	0.001
Strong	1704	6249	<0.001	0.914	0.003	0.044	0.001
POST							
Configural	1560	6885	-	0.931	-	0.045	-
Weak	1632	6990	0.013	0.93	0.001	0.045	0
Strong	1704	7147	<0.001	0.927	0.002	0.044	0.001

Table A-3. Measurement Invariance Testing for Gender

Test	DF	χ2	Δ χ2 p	CFI	Δ CFI	RMSEA	Δ RMSEA
PRE							
Configural	780	4917	-	0.92	-	0.044	-
Weak	804	4973	0.001	0.919	0.001	0.043	0.001
Strong	828	5251	<0.001	0.913	0.006	0.044	0.001
POST							
Configural	780	5346	-	0.937	-	0.042	-
Weak	804	5387	0.016	0.936	0.001	0.042	0
Strong	828	5557	<0.001	0.933	0.003	0.042	0

Table A-4. Measurement Invariance Testing for Grade Level

Test	DF	χ2	Δ χ2 p	CFI	Δ CFI	RMSEA	Δ RMSEA
PRE							
Configural	780	5019	-	0.917	-	0.046	-
Weak	804	5053	0.201	0.917	0.000	0.045	0.001
Strong	828	5145	<0.001	0.915	0.002	0.045	0
POST							
Configural	780	5370	-	0.937	-	0.043	-
Weak	804	5406	0.123	0.936	0.001	0.043	0
Strong	828	5502	<0.001	0.934	0.002	0.043	0

Table A-5. Measurement Invariance Testing for Required v. Elective Course Status

Test	DF	χ2	Δ χ2 p	CFI	Δ CFI	RMSEA	Δ RMSEA
PRE							
Configural	780	4923	-	0.919	-	0.044	-
Weak	804	4951	0.364	0.919	0.000	0.044	0
Strong	828	4977	0.342	0.918	0.001	0.043	0.001
POST							
Configural	780	5422	-	0.935	-	0.043	-
Weak	804	5450	0.279	0.935	0	0.043	0
Strong	828	5481	0.139	0.934	0.001	0.042	0.001

Using Overall EMI Mean Scores

The bulk of our analyses in the previous section used factor scores, which was necessary to assess the EMI instrument. Factor scores allowed us to examine correlations among items without any residual variance, creating less statistical "noise", as all analyses happened within the CFA model. However, for the rest of the paper, we switch to actual observed mean scores of the EMI, primarily because we will use these scores for final reporting purposes. Table A-6 on the next page displays the correlations between our pre-EMI observed mean construct scores and the pre-EMI factor construct scores to establish a strong association between observed mean scores and factor scores. This strong relationship between observed mean scores and factor scores persists in our post-EMI.

Table A-6. Correlation between Pre-EMI Constructs Observed Means and Factor Scores

Observed Means

	COMMUNICATION & COLLABORATION	CRITICAL THINKING & PROBLEM SOLVING	CREATIVITY & INNOVATION	OPPORTUNITY RECOGNITION	COMFORT WITH RISK	FUTURE ORIENTATION
COMMUNICATION & COLLABORATION	**0.95**	0.79	0.74	0.81	0.65	0.68
CRITICAL THINKING & PROBLEM SOLVING	0.65	**0.98**	0.86	0.85	0.66	0.74
CREATIVITY & INNOVATION	0.64	0.9	**0.96**	0.85	0.65	0.71
OPPORTUNITY RECOGNITION	0.68	0.87	0.83	**0.96**	0.75	0.81
COMFORT WITH RISK	0.54	0.66	0.63	0.74	**0.98**	0.57
FUTURE ORIENTATION	0.57	0.75	0.69	0.8	0.58	**0.99**

Factor Scores (row axis label)

We also assessed the relationship between individual constructs and an overall EMI mean score, comprised of an average of the six constructs mean scores. Table A-7 on the next page shows that the correlation between individual construct observed mean scores and an aggregate EMI mean score is also relatively strong, especially in the post-EMI. The strong correlations between observed mean scores and factor scores, as well as construct mean scores and an overall EMI mean score, enables us to conduct further analyses using an overall EMI mean score.

Table A-7. Correlation between Individual EMI Construct Means and an Overall EMI Mean Score

	Pre-EMI	Post-EMI
COMMUNICATION & COLLABORATION	0.84	0.85
CRITICAL THINKING & PROBLEM SOLVING	0.82	0.86
CREATIVITY & INNOVATION	0.78	0.83
OPPORTUNITY RECOGNITION	0.78	0.84
COMFORT WITH RISK	0.71	0.76
FUTURE ORIENTATION	0.71	0.78

Table B-1. OLS Regression: Relationship between EM Change (Binary) and ESE Change (Scaled)

	(1) ESE_Change	(2) ESE_Change	(3) ESE_Change	(4) ESE_Change
EM_Change_Dummy	0.400*** (0.0573)	0.381*** (0.0618)	0.371*** (0.0644)	0.376*** (0.0657)
Asian		0.0869 (0.119)	-0.0123 (0.126)	-0.113 (0.138)
Hispanic		-0.0949 (0.0957)	-0.156 (0.100)	-0.204 (0.111)
Black		-0.0867 (0.0963)	-0.121 (0.101)	-0.118 (0.109)
Female		-0.0198 (0.0601)	-0.0267 (0.0627)	-0.0245 (0.0641)
Immigrant		0.121 (0.0893)	0.130 (0.0936)	0.118 (0.0974)
Entrepreneurial_ Background		-0.129* (0.0599)	-0.143* (0.0624)	-0.134* (0.0637)
EM_PRE		-0.00390 (0.00230)	-0.00521* (0.00242)	-0.00472 (0.00248)
High School			0.278** (0.0930)	0.316** (0.104)
Full Year Course			-0.180* (0.0780)	-0.148 (0.0916)
Required Course			0.00481 (0.0699)	0.0578 (0.0970)
Standalone Course			0.0931 (0.0688)	0.0907 (0.0966)
_cons	0.00495 (0.0423)	0.401* (0.195)	0.394 (0.230)	0.309 (0.247)
State FE	NO	NO	NO	YES
R^2	0.014	0.019	0.026	0.024
F	48.71	7.668	6.538	5.753
Prob > F	0.000	0.000	0.000	0.000
N	3553	3247	2968	2892

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
*Model 4 includes state fixed effects. Details on this:

```
Number of obs       =       2892
Number of groups    =         14

Obs per group: min  =          9
                avg =      206.6
                max =        655
```

Table B-2. Logistic Regression: Relationship between EM Change (Binary) and ESE Change (Binary) – Odds Ratios

	(1) ESE_Change_Dummy	(2) ESE_Change_Dummy	(3) ESE_Change_Dummy	(4) ESE_Change_Dummy
EM_Change_Dummy	2.053*** (0.176)	2.033*** (0.188)	2.042*** (0.200)	2.029*** (0.200)
Asian		1.297 (0.240)	1.117 (0.224)	1.110 (0.223)
Hispanic		0.920 (0.134)	0.860 (0.134)	0.874 (0.137)
Black		0.765 (0.111)	0.726* (0.112)	0.731* (0.114)
Female		1.035 (0.0937)	1.023 (0.0978)	1.018 (0.0985)
Immigrant		1.149 (0.157)	1.223 (0.180)	1.194 (0.177)
Entrepreneurial_Background		0.861 (0.0777)	0.841 (0.0802)	0.849 (0.0818)
EM_PRE		0.998 (0.00345)	0.996 (0.00364)	0.996 (0.00371)
High School			1.555** (0.217)	1.599*** (0.226)
Full Year Course			0.823 (0.0995)	0.827 (0.101)
Required Course			1.191 (0.128)	1.197 (0.131)
Standalone Course			1.157 (0.122)	1.145 (0.122)
State FE	NO	NO	NO	YES
chi2	71.32	87.22	106.9	96.63
Prob > chi2	0.000	0.000	0.000	0.000
N	2353	2151	1966	1925

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B-3. ANOVA Regression: Relationship between EM Change (Mean) and ESE Change (Groups; 1 = negative change, 2 = no change, 3 = positive change)

	(1) EM_Change	(2) EM_Change	(3) EM_Change	(4) EM_Change
1.Groups_ESE	0 (.)	0 (.)	0 (.)	0 (.)
2.Groups_ESE	2.818*** (0.638)	2.837*** (0.609)	3.040*** (0.641)	3.054*** (0.648)
3.Groups_ESE	5.529*** (0.616)	4.896*** (0.589)	5.068*** (0.621)	5.043*** (0.627)
Asian		-1.167 (0.929)	-0.932 (0.993)	-1.668 (1.078)
Hispanic		-0.738 (0.747)	-0.454 (0.789)	-0.833 (0.869)
Black		0.109 (0.752)	0.291 (0.796)	-0.384 (0.853)
Female		0.651 (0.470)	0.589 (0.493)	0.390 (0.501)
Immigrant		-0.0854 (0.697)	-0.382 (0.737)	-0.332 (0.762)
Entrepreneurial_ Background		1.001* (0.468)	0.919 (0.491)	0.931 (0.498)
EM_PRE		-0.438*** (0.0174)	-0.425*** (0.0184)	-0.424*** (0.0188)
High School			1.084 (0.734)	2.000* (0.815)
Full Year Course			0.226 (0.614)	0.349 (0.715)
Required Course			0.360 (0.551)	0.610 (0.758)
Standalone Course			0.943 (0.541)	-0.0772 (0.755)
_cons	-2.770*** (0.479)	27.89*** (1.477)	24.82*** (1.774)	24.63*** (1.886)
State FE	NO	NO	NO	YES
R^2	0.022	0.181	0.175	0.179
F	40.83	80.55	48.85	24.26
Prob > F	0.000	0.000	0.000	0.000
N	3590	3280	2998	2922

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B-4. Logistic Regression: Relationship between EM Change (Binary) and Attitude Toward Entrepreneurship Being A Skill That Can Be Used in Any Career After NFTE (Binary; 1 = Yes, 0 = No)

	(1) P_Re_usable_Skill	(2) P_Re_usable_Skill	(3) P_Re_usable_Skill	(4) P_Re_usable_Skill
EM_Change_Dummy	1.658*** (0.112)	1.860*** (0.134)	1.998*** (0.159)	1.970*** (0.160)
Re_usable_Skill		2.177*** (0.151)	2.041*** (0.157)	2.064*** (0.162)
EM_PRE		1.016*** (0.00275)	1.016*** (0.00306)	1.017*** (0.00312)
Asian			1.161 (0.179)	1.205 (0.194)
Hispanic			0.717** (0.0875)	0.755* (0.0983)
Black			0.699** (0.0861)	0.715** (0.0906)
Female			1.053 (0.0808)	1.044 (0.0815)
Immigrant			0.910 (0.105)	0.870 (0.103)
Entrepreneurial_ Background			1.251** (0.0955)	1.263** (0.0980)
High School			0.787* (0.0890)	0.788* (0.0944)
Full Year Course			1.247* (0.120)	1.287* (0.142)
Required Course			1.069 (0.0913)	1.088 (0.105)
Standalone Course			0.926 (0.0781)	0.854 (0.121)
State FE	NO	NO	NO	YES
chi2	56.43	239.3	242.4	215.8
Prob > chi2	0.0000	0.0000	0.0000	0.0000
N	3622	3622	3027	2951

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B-5. Logistic Regression: Relationship between EM Change (Binary) and Attitude Toward Entrepreneurship Being A Skill That Can Be Used in Any Career (Binary; 1 = Students Went from No to Yes, 0 = Students Went from Yes to No)

	(1) Reusable_Skill_Change	(2) Reusable_Skill_Change	(3) Reusable_Skill_Change	(4) Reusable_Skill_Change
EM_Change_Dummy	1.714*** (0.184)	1.703*** (0.199)	1.821*** (0.223)	1.713*** (0.217)
Asian		0.902 (0.200)	0.888 (0.208)	0.939 (0.239)
Hispanic		0.838 (0.152)	0.889 (0.168)	0.943 (0.197)
Black		0.847 (0.153)	0.852 (0.162)	0.762 (0.158)
Female		0.981 (0.110)	1.004 (0.119)	1.000 (0.122)
Immigrant		0.835 (0.138)	0.815 (0.141)	0.794 (0.146)
Entrepreneurial_Background		1.369** (0.153)	1.347* (0.158)	1.329* (0.161)
EM_PRE		0.999 (0.00431)	0.998 (0.00460)	0.998 (0.00478)
High School			0.837 (0.142)	1.056 (0.206)
Full Year Course			1.134 (0.171)	1.281 (0.221)
Required Course			1.138 (0.151)	1.434* (0.257)
Standalone Course			1.066 (0.138)	0.898 (0.154)
State FE	NO	NO	NO	YES
chi2	25.44	34.51	39.94	36.75
Prob > chi2	0.0000	0.0000	0.0001	0.0002
N	1450	1335	1224	1190

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B-6. Logistic Regression: Relationship between EM Change (Binary) and Attitude Toward Entrepreneurship Being A Skill That Can Be Used in Any Career (Binary; 1 = Students Went from No to Yes, 0 = Students Went from No to No)

	(1) Reusable_Skill_ Stat_Neg	(2) Reusable_Skill_ Stat_Neg	(3) Reusable_Skill_ Stat_Neg	(4) Reusable_Skill_ Stat_Neg
EM_Change_Dummy	1.553*** (0.156)	1.736*** (0.190)	1.787*** (0.205)	1.784*** (0.207)
Asian		1.239 (0.271)	1.299 (0.304)	1.317 (0.309)
Hispanic		0.696* (0.118)	0.676* (0.119)	0.691* (0.123)
Black		0.703* (0.119)	0.685* (0.122)	0.697* (0.125)
Female		1.053 (0.111)	1.101 (0.122)	1.100 (0.123)
Immigrant		1.076 (0.174)	1.051 (0.178)	0.960 (0.167)
Entrepreneurial_Background		1.282* (0.135)	1.243* (0.137)	1.255* (0.140)
EM_PRE		1.017*** (0.00401)	1.018*** (0.00421)	1.019*** (0.00429)
High School			0.683* (0.110)	0.691* (0.113)
Full Year Course			1.255 (0.174)	1.251 (0.174)
Required Course			0.986 (0.121)	0.984 (0.123)
Standalone Course			0.853 (0.104)	0.836 (0.103)
State FE	NO	NO	NO	YES
chi2	19.38	58.37	64.59	60.24
Prob > chi2	0.0000	0.0000	0.0000	0.0000
N	1781	1635	1517	1485

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-1. Logistic Regression: Relationship between EM Change (Binary) and Desire to Want to Own a Business After NFTE (Binary; 1 = Yes, 0 = No)

	(1) P_Ent_Intention	(2) P_Ent_Intention	(3) P_Ent_Intention	(4) P_Ent_Intention
EM_Change_Dummy	1.245** (0.0934)	1.666*** (0.149)	1.692*** (0.167)	1.664*** (0.166)
Ent_Intention		9.287*** (0.864)	9.018*** (0.944)	8.834*** (0.935)
EM_PRE		1.023*** (0.00343)	1.026*** (0.00385)	1.026*** (0.00391)
Asian			0.995 (0.184)	0.995 (0.184)
Hispanic			1.339 (0.201)	1.362* (0.206)
Black			1.514** (0.231)	1.543** (0.236)
Female			0.592*** (0.0568)	0.603*** (0.0586)
Immigrant			1.228 (0.179)	1.256 (0.188)
Entrepreneurial_ Background			1.062 (0.101)	1.053 (0.102)
High School			1.006 (0.140)	1.017 (0.144)
Full Year Course			0.989 (0.116)	1.035 (0.122)
Required Course			0.952 (0.101)	0.995 (0.108)
Standalone Course			1.139 (0.118)	1.132 (0.119)
State FE	NO	NO	NO	YES
chi2	8.506	758.8	668.7	527.1
Prob > chi2	0.0035	0.0000	0.0000	0.0000
N	3589	3553	2968	2892

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-2. Logistic Regression: Relationship between EM Change (Binary) and Desire to Want to Own a Business After NFTE (Binary; 1 = Students Went from No to Yes, 0 = Students Went from Yes to No)

	(1) Ent_Intention_Change	(2) Ent_Intention_Change	(3) Ent_Intention_Change	(4) Ent_Intention_Change
EM_Change_Dummy	1.978*** (0.312)	2.009*** (0.346)	2.098*** (0.386)	2.023*** (0.376)
Asian		1.070 (0.335)	1.075 (0.359)	1.052 (0.353)
Hispanic		1.509 (0.383)	1.470 (0.400)	1.468 (0.400)
Black		1.286 (0.329)	1.220 (0.336)	1.246 (0.343)
Female		0.561*** (0.0956)	0.552*** (0.0994)	0.558** (0.102)
Immigrant		1.051 (0.271)	1.153 (0.316)	1.168 (0.326)
Entrepreneurial_ Background		0.732 (0.123)	0.704 (0.127)	0.696* (0.126)
EM_PRE		0.999 (0.00596)	1.000 (0.00634)	1.001 (0.00639)
High School			0.901 (0.221)	0.914 (0.227)
Full Year Course			0.841 (0.183)	0.871 (0.191)
Required Course			1.020 (0.198)	1.021 (0.201)
Standalone Course			1.055 (0.201)	1.032 (0.198)
State FE	NO	NO	NO	YES
chi2	19.13	34.53	33.68	28.77
Prob > chi2	0.0000	0.0000	0.0008	0.0043
N	720	660	603	588

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C-3. Logistic Regression: Relationship between EM Change (Binary) and Desire to Want to Own a Business After NFTE (Binary; 1 = Students Went from No to Yes, 0 = Students Went from No to No)

	(1) Ent_Intention_Change _Neg	(2) Ent_Intention_Change _Neg	(3) Ent_Intention_Change_ Neg	(4) Ent_Intention_Change _Neg
EM_Change_Dummy	1.446* (0.222)	1.590** (0.270)	1.676** (0.306)	1.732** (0.320)
Asian		0.576 (0.177)	0.646 (0.216)	0.635 (0.215)
Hispanic		0.803 (0.204)	0.761 (0.207)	0.787 (0.217)
Black		0.943 (0.247)	0.852 (0.240)	0.897 (0.255)
Female		0.554*** (0.0905)	0.551*** (0.0960)	0.555*** (0.0983)
Immigrant		1.205 (0.306)	1.182 (0.319)	1.213 (0.336)
Entrepreneurial_ Background		1.171 (0.194)	1.163 (0.206)	1.099 (0.197)
EM_PRE		1.016** (0.00622)	1.017* (0.00664)	1.019** (0.00683)
High School			0.641 (0.160)	0.626 (0.160)
Full Year Course			1.151 (0.241)	1.243 (0.264)
Required Course			0.885 (0.168)	0.950 (0.186)
Standalone Course			0.832 (0.154)	0.822 (0.154)
State FE	NO	NO	NO	YES
chi2	5.821	28.69	31.37	30.45
Prob > chi2	0.0057	0.0004	0.0017	0.0024
N	790	706	637	617

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D-1. ANOVA Regression: Relationship between EM Change (Mean) and Content Change Ranks (Class-Level Groups; 1 = Highest Change Between Diagnostic and Summative, 4 = Lowest Change Between Diagnostic and Summative)

	(1) EM_Change	(2) EM_Change	(3) EM_Change	(4) EM_Change
1.Content_Change_Rank	0 (.)	0 (.)	0 (.)	0 (.)
2.Content_Change_Rank	0.00161 (0.803)	0.641 (0.770)	0.605 (0.785)	0.610 (0.811)
3.Content_Change_Rank	-1.194 (0.786)	-0.789 (0.756)	-0.880 (0.794)	-1.122 (0.830)
4.Content_Change_Rank	-2.756** (0.995)	-2.581** (0.966)	-2.742** (1.015)	-2.171* (1.033)
Asian		-0.774 (0.962)	-0.800 (1.035)	-1.937 (1.129)
Hispanic		-0.467 (0.781)	-0.384 (0.828)	-1.078 (0.915)
Black		-0.0419 (0.790)	0.141 (0.837)	-0.645 (0.894)
Female		0.547 (0.500)	0.500 (0.526)	0.327 (0.535)
Immigrant		0.246 (0.735)	-0.206 (0.772)	-0.176 (0.799)
Entrepreneurial_ Background		1.026* (0.498)	0.890 (0.523)	0.911 (0.530)
EM_PRE		-0.446*** (0.0184)	-0.437*** (0.0195)	-0.435*** (0.0199)
High School			1.834* (0.761)	3.036*** (0.873)
Full Year Course			-0.158 (0.674)	0.119 (0.793)
Required Course			0.190 (0.584)	0.902 (0.820)
Standalone Course			0.803 (0.588)	0.507 (0.835)
_cons	1.255 (0.665)	31.67*** (1.579)	29.09*** (1.889)	28.85*** (2.021)
State FE	NO	NO	NO	YES
R^2	0.004	0.169	0.163	0.166
F	4.164	61.04	38.74	19.83
Prob > F	0.0059	0.000	0.000	0.000
N	3315	3022	2793	2718

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D-2. ANOVA Regression: Relationship between EM Change (Mean) and Content Summative Ranks (Class-Level Groups; 1 = Highest mean score, 4 = Lowest Mean Score)

	(1) EM_Change	(2) EM_Change	(3) EM_Change	(4) EM_Change
1.Content_Summ_Rank	0 (.)	0 (.)	0 (.)	0 (.)
2.Content_Summ_Rank	-0.309 (0.740)	-1.041 (0.711)	-1.281 (0.739)	-1.519 (0.797)
3.Content_Summ_Rank	-1.272 (0.799)	-1.844* (0.777)	-1.794* (0.821)	-1.786* (0.887)
4.Content_Summ_Rank	-3.437*** (0.928)	-4.832*** (0.907)	-5.005*** (0.944)	-4.844*** (1.058)
Asian		-0.981 (0.962)	-1.070 (1.035)	-1.988 (1.126)
Hispanic		-0.500 (0.779)	-0.393 (0.826)	-1.059 (0.912)
Black		0.443 (0.798)	0.493 (0.842)	-0.316 (0.899)
Female		0.456 (0.500)	0.386 (0.525)	0.250 (0.534)
Immigrant		0.258 (0.734)	-0.241 (0.771)	-0.258 (0.799)
Entrepreneurial_ Background		1.029* (0.497)	0.928 (0.521)	0.927 (0.529)
EM_PRE		-0.447*** (0.0183)	-0.440*** (0.0194)	-0.437*** (0.0198)
High School			1.927* (0.765)	3.061*** (0.873)
Full Year Course			-0.412 (0.681)	-0.425 (0.795)
Required Course			0.526 (0.582)	1.310 (0.820)
Standalone Course			0.868 (0.589)	1.012 (0.837)
_cons	1.408* (0.620)	32.91*** (1.568)	30.47*** (1.889)	30.13*** (2.029)
State FE	NO	NO	NO	YES
R^2	0.005	0.173	0.168	0.169
F	6.080	62.88	39.98	20.27
Prob > F	0.0004	0.000	0.000	0.000
N	3315	3022	2793	2718

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[1] This is different from the emergence of the gig economy, which has led in recent years to an increase in the number of freelancers. See Upwork's 2017 report, "Freelancing in America."

[2] Denning, 2016.

[3] Bacigalupo, Kampylis, Punie, & Brande, 2016.

[4] See, for example, the World Economic Forum, 2016, "The Future of Jobs."

[5] Millennial Branding, 2012.

[6] Bacigalupo et al., 2016.

[7] Kautz, T. et al., 2014; Farrington, C. et al., 2012.

[8] EPI, 2015. (http://www.epi.org/publication/the-need-to-address-noncognitive-skills-in-the-education-policy-agenda/)

[9] Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D. & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. Child Development, 82(1): 405–432.

[10] Entrepreneurship programs are also growing outside of the traditional business departments and becoming cross functional across universities. See https://www.nytimes.com/2015/12/29/technology/universities-race-to-nurture-start-up-founders-of-the-future.html?_r=0

[11] Junior Achievement, 2015.

[12] Bacigalupo et al., 2016.

[13] Comprehending the mindset of an entrepreneur is also of great interest to those who want to push for more startups. A recent review of the literature suggests that a better understanding of the way entrepreneurs think will provide more information about the antecedents to developing new ventures (Brannback and Carsrud 2017). Entrepreneurial mindset is one important factor in this equation, as it is a combination of cognitive and noncognitive skills that, with the right context, will drive toward the development of new businesses.

[14] Hayes and Richmond, 2017.

[15] Borghans et al., 2008.

[16] Lichtenstein and Monroe-White, 2017.

[17] See VentureWell's efforts to define entrepreneurial mindset: https://venturewell.org/determining-entrepreneurial-mindset/.

[18] Herman et al., 2010.

[19] http://entremetric.com/

[20] Bolton et al., 2012.

[21] Emerging from the Danish Foundation for Entrepreneurship, the ASTEE project created an instrument to assess the impact of entrepreneurship education on students by measuring entrepreneurial mindset, knowledge and skills, as well as connectedness to education. The latter domain addresses the potential impact of entrepreneurship education on a student's academic mindset. The ASTEE project is further focused on entrepreneurship education at multiple levels of schooling, from primary school to postsecondary.

[22] NFTE is currently introducing an entrepreneurship pathway that takes students on a journey from awareness and exposure to expertise and finally to application. For more on NFTE's entrepreneurship Pathway, see http://www.nfte.com/our-programs/.

[23] Bae T.J., et al., 2014.

[24] Pihie, Z. A. L., & Akmaliah, Z. (2009). Entrepreneurship as a career choice: An analysis of entrepreneurial self-efficacy and intention of university students. European journal of social sciences, 9(2), 338-349.

[25] Nakamoto and Rice, 2017.

[26] Nakkula, et al., 2003.

[27] Petway, K. T., Rikoon, S. H., Brenneman, M. W., Burrus, J., & Roberts, R. D. (2016). Development of the Mission Skills Assessment and Evidence of Its Reliability and Internal Structure. ETS Research Report Series, 2016(1), 1-15.

[28] We also explored using anchoring vignettes (AV), which are item types used to correct reference bias by standardizing the varying reference points of test-takers when answering Likert scale questions. In the end, we decided to not move forward with AV type items due to their wordy nature and heavy cognitive load that made the assessment unwieldy.

[29] For example, we found in one question for the flexibility and adaptability construct used the term "shifting demands," which the students did not understand. As a result, we changed the wording.

[30] Situational Judgement Tests (SJTs) are a type of psychological assessment that present test-takers with scenarios for which they have to rank different responses to each situation.

[31] While we do not delve deeply into the initial testing phase of the EMI in this paper, the authors are happy to provide interested readers with more information on the process and statistical techniques used by NFTE and ETS.

[32] For more on latent constructs, see https://johngarger.com/articles/methodology/latent-constructs-in-social-science-research.

[33] Hox and Bechger, 1998.

[34] These analyses use observed mean scores rather than factor scores; see Appendix A for more information.

[35] Given our overall large sample size, our sub-group analyses contained at least 450 student responses with individual cell sizes exceeding 170 observations

[36] See, for example, Chen et al., 1998; McGee at al., 2009; Nabi et al. 2017.

[37] Chen et al., 1998.

[38] Mauer et al., 2017.

[39] Bandura, 1977, p. 29, cited in Maurer et al, 2017.

[40] Pihie, Z. A. L., & Akmaliah, Z., 2009.

[41] Krueger, N. et al., 2000.

[42] Given the number of students who experienced no ESE growth between the beginning and end of NFTE, we also considered EMI mean change scores in context of the three ESE categories (negative growth, no growth, positive growth). We found that EMI change scores were statistically significantly positive for students with positive ESE growth and that the absolute EMI change score was also the highest for students with positive ESE growth. Students with no ESE growth showed a negligible change in EMI between the beginning and end of NFTE, whereas students with negative ESE growth showed a negative EMI change. All of the above analyses included controls and state fixed effects.

[43] Krueger, N. (2009). Entrepreneurial intentions are dead: Long live entrepreneurial intentions. In Understanding the entrepreneurial mind (pp. 51-72). Springer New York.

[44] In addition, positive growth in entrepreneurial mindset is a predictor for students who experience a change in their desire to want to own a business. Students who grow in their mindset are more likely to change their desire from wanting to own a business from "no" to "yes" compared to students who experienced negative mindset change (see Appendix C).

[45] Fornell and Larcker 1981, Nunnally and Bernstein 1994

[46] For more on this approach, see
http://comm.eval.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=63758fed-a490-43f2-8862-2de0217a08b8.

[47] Yu, 2002.

About NFTE

NFTE (Network for Teaching Entrepreneurship) is an internationally recognized nonprofit that activates the entrepreneurial mindset in young people. Research shows that the entrepreneurial mindset—skills including innovation, self-reliance, comfort with risk, communication, and problem-solving—prepares young people for lifelong success. Equipped with the mindset, as well as the business and academic skills that NFTE teaches, NFTE students are ready to thrive in the innovation economy no matter what path they choose. NFTE focuses its work on under-resourced communities. Through its nationwide network of program offices, NFTE partnered with 1,882 schools and community-based organizations across the U.S. last year, reaching more than 52,000 students in 20 states. Partnerships in eight other countries allowed NFTE to serve an additional 53,000 young people internationally. Learn more at www.nfte.com.

About NFTE's EMI Research

For more information about NFTE's Entrepreneurial Mindset Index, contact Sophia Rodriguez, Director of Research & Analytics, at sophia.rodriguez@nfte.com.