Building a Community for Educational Transformation in Higher Education

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Abstract—This Innovation to Practice, Work-In-Progress Paper discusses efforts toward building a community for educational transformation in Higher Education led by the department of Open Learning at the Massachusetts Institute of Technology (MIT). MIT has a long history of implementing hands-on, science-based, problem-focused engineering education by working on authentic real-life problems. Within this context, sustainability has been and remains at the core of the MIT curriculum. In addition, Open Learning has a core mission to support educational transformation within the institution as well as around the world. In order for these goals to be fully achieved, institutional partnerships and global input are critical.

In 2017 Open Learning, with support from Community Jameel, founded the Abdul Latif Jameel World Education Lab (J-WEL), a consortium of global members. Through J-WEL, MIT works with member organizations to promote excellence and transformation in education at MIT and worldwide. This paper focuses on the work taking place through one of three J-WEL subgroups, a collaborative focusing on higher education that is primarily composed of universities. By design, the J-WEL higher education collaborative members actively engage throughout the year via both online and in-person mechanisms.

There are currently 20 higher education members who are working on 20 different goals regarding education transformation. Our future work includes building research partnerships between members through an innovation in education grant program, and assessing the outcomes of the collaboration facilitated by the consortium.

Keywords—educational transformation, community building, learning community, authentic challenges

I. INTRODUCTION

Engagement with global university peers is considered to be an important aspect of higher education. There are multiple engagement approaches including study abroad programs, research collaborations, joint development of new programs, departments, or, in some cases, new universities. In this paper, we put forth an innovative model for global university engagement with the aim to produce: 1) concrete actionable change in teaching and learning with particular focus on sustainability 2) inculcation of global insights into the education of the host university; and 3) a cross-collaborative, diverse community united by the mission to transform education.

This model builds on existing work with regard to creation of global communities of learning and practice, while it also promotes and supports authentic problem-based learning as a means to support sustainability. The relationship between community members aims to be reciprocal, with each member having the opportunity to learn from others. Novelty is achieved by the fact that the community 1) is informed by a diverse global set of universities and other education-related entities, presenting a diverse set of challenges and opportunities for transforming engineering education; 2) includes all university stakeholders in the transformation (university leadership, faculty, staff, and students); and 3) allows for better understanding of global sustainability related challenges and supports the formation of regional or worldwide research and development partnerships in order to address them.

Work described in the paper takes place at MIT, a pioneer in experimental and hands-on engineering education [1] with a reputation for educational innovation. MIT "has a long history of pedagogical boldness balanced with deep introspection. The institution's very existence is based on a grand and daring experiment in teaching. The pedagogies used created a hands-on, science-based, problem-focused engineering curriculum that continues to define MIT's educational model to this day" [1].

This bold decision to shift from rote memorization of information to constructive experiential learning over a century ago is what differentiated MIT from other institutions, and has now turned its educational model into a global standard for STEM education. Furthermore, MIT not only proposes that higher education is built on problem and project-based learning, but that projects are based on current small or large scale authentic challenges and real-world applications [2], also suggested by the United Nations Sustainable Development Goals.

To support this philosophy, the MIT curriculum is frequently reinvented, aiming to be responsive and agile to a changing world that is constantly presenting global scale challenges and demands. In recent years, the curriculum has incorporated the inclusion of design-based learning, use of real-world case studies, and instruction based on active-learning pedagogies guided by the most recent findings from the science of learning [3]. On top of that, MIT has placed a huge effort on the development of digital education components, expected to be used both to enhance the residential education experience for

students, as well as to reach a global non-MIT audience [4] through numerous initiatives such as MITx, MIT OpenCourse-Ware, and MIT xPRO.

Latest attempts to enhance the curriculum and to develop new engineering programs focus on making projects, courses, and programs more interdisciplinary and less siloed, with an even greater shift from content-based to content-and-skills-based education [5-6]. Furthermore, MIT works to ensure that learners become supportive of a sustainable environment with guidance from, and incorporation of, the United Nations Sustainable Development Goals in their work. Last but not least, MIT works towards ensuring that learners are prepared for diverse careers post graduation [5-6].

A. Importance of Global Partnerships

An important aspect that has influenced the MIT pedagogical approach, and higher education institutes more generally, are international engagements and partnerships. These international engagements have allowed opportunities for MIT faculty, staff, and students to fully realize the university's mission to solve global challenges while educating the world.

International engagements benefit both students and faculty. These experiences provide students with opportunities, access, and understanding of relevant global challenges. Faculty receive input for research and are able to compare different educational models. At the same time, MIT students, faculty and staff share their experience and expertise with international collaborators.

MIT's strategic decision towards building global partnerships is not new; on the contrary, the institute has developed and utilized various models to engage internationally [7]. On top of numerous small scale, one-to-one international research and teaching collaborations, MIT has also used "institutional transplantation" [7-8]. In this approach, an educational model from one region of the world is adapted and transplanted to another in the form of a new school or even a new university. These collaborations are useful as they address engineering grand challenges by fundamentally reforming traditional models of engineering education and promoting updated mentalities and practices, albeit within the boundaries of the new institutions.

Despite the aforementioned benefits, large scale international institutional development comes at a high cost in terms of human capital involvement, given the required demand on human resources. This makes such models not easily replicable. MIT recognized the need for a more efficient and sustainable knowledge-transfer model. After decades of one-to-one university engagements, MIT developed an innovative consortium model for university collaborations that can provide scale as well as impact.

II. COMMUNITIES OF PRACTICE & THE IMPORTANCE OF LEARNING

MIT's model builds on existing work of global learning community creation, [10-11] particularly in terms of Open Education and collaboration. There are other similar consortium models for higher education in the United States as well as abroad e.g., LASPAU from Harvard University, the University Design Institute at Arizona State University (ASU), and the European Universities Consortium. There are also multiple examples of consortiums in higher education focused on a specific topic, such as entrepreneurship education or digital education. [12-13]

Within existing consortiums, there are examples of faculty learning communities or isolated workshops focused on new pedagogies and technology implementation, but these opportunities are generally limited in scope (ie. week-long training with no continuing relationship) or limited to only faculty involvement. There are less opportunities for senior university leadership to openly collaborate or exchange strategies and challenges; there are even fewer spaces that allow for engagement with all stakeholders across the universities—senior university leadership, faculty, and staff—what we believe is essential for real transformation in higher education at all levels.

Additionally, similar consortiums tend to remain somewhat removed from the curriculum, pedagogy, and faculty of the hosting institution. This work is often considered as part of global outreach and not an educational endeavor. Our model is housed within an academic department of MIT and led by MIT faculty, who engage directly with consortium activities. It is through this two-way interaction that curriculum at both the hosting institution (MIT) and the membership is influenced.

III. THE INNOVATION

The pathway to these beneficial international engagements was created by 2017 when MIT leadership created the Abdul Latif Jameel World Education Lab (J-WEL) [9]. The consortium was developed for members working in education and instantiated MIT's aim to move towards a sustainable model of education transformation.

J-WEL was designed to reflect the main stages of a life-long learner through three subgroups labeled 'collaboratives,' identified by the segment of learners they serve. Each collaborative is led by a team of expert staff and informed by faculty leadership. Collaboratives operate under a membership model. The remainder of this paper focuses on work conducted within the Higher Education Collaborative, the J-WEL subgroup comprised of both government and university members. Before a prospective member joins the collaborative, there are multiple conversations with the Higher Education leadership, followed by an application process to determine: 1) alignment of the applicants' respective goals and aims to those of the existing community; 2) overall goals and challenges of the university (or university system); and 3) the applicant's plans to create change within their respective university, and their ideas for expanding this more widely across their region.

If the applicant's needs and goals are aligned with J-WEL's mission, they are offered J-WEL membership. They then complete a strategic survey. This survey is distributed and completed by stakeholders across the university including

university leadership, junior/senior faculty, staff, and in some cases, students. The resultant data are analyzed by MIT staff, and shared with the new member in a report format. The report concludes with suggestions from J-WEL staff regarding a specific focus or goal(s) that the member may want to consider during their membership cycle (three years minimum). Based on the member's response to the suggested goals and their desired level of membership engagement with J-WEL, a timeline of activities is developed in order for them to advance towards agreed-upon goals.

Analysis of the strategic survey data also assists J-WEL to further identify common topics of interest among members as well as current global educational challenges. Data from strategic reports, member expressions of interest, and input from J-WEL staff and affiliated faculty have been used to develop five pillars for engagement with the J-WEL consortium. We believe these pillars are core to a successful university. As presented in Figure 1, these pillars are: 1) Curriculum and Pedagogy, 2) Digital & Online Learning, 3) University Strategy & Structure, 4) Research Practice, and 5) Entrepreneurship & Innovation.

Fig. 1. The five pillars of engagement with the J-WEL consortium

Each member works toward a specific and contextual goal that is related to one of these pillars. As evidenced by the breadth of our pillars, the scope of J-WEL remains broad and flexible.

In addition to suggesting a focus or goals for prospective J-WEL members, the initial strategic report also provides suggestions for J-WEL activities that can assist the member to achieve their goals. Suggestions come from a set of planned activities that address the above pillars. The activities are designed to be scalable and inclusive of stakeholders across universities.

The planned activities include:

- Week-long gatherings on the MIT campus for senior university leadership, organized around an agreed-upon theme. The gatherings provide first-hand access to MIT innovations and practice, along with a platform to connect and learn from other members.

- Intensive, hands-on, outcome-oriented workshops held on the MIT campus and designed for faculty and staff.
- Frequent live online discussions and workshops with MIT faculty that focus on a multitude of topics in Higher Education.
- Access to top MIT students, staff, and faculty, to support members' goals in-country, including MIT student internships and seminars/clinics delivered at the member's campus.

Membership in J-WEL has an annual fee. The fee is associated with the level of engagement, often dependent upon the scope of the work to be carried out. Membership categories range from an introductory level, which allows for participation in the senior university gatherings, workshops, and online sessions, to a charter membership level which includes the aforementioned items in addition to a co-developed and co-implemented higher education project with the member's university.

Although the majority of activities are focused on spreading best practices from MIT, J-WEL membership is indeed a two-way interaction. Each activity is co-designed with member input. For example, for the senior university leadership gatherings, the point of contact for each membership provides input on the agenda and event organization and subsequently reviews a draft of the agenda. Additionally, in each of the activities that include multiple members, i.e., weeklong gatherings, members share their own work and experience while responding to questions and receiving feedback from MIT and all other participating members. For example, in our most recent gathering, held virtually due to the Covid-19 outbreak, 33 sessions were offered and 12 of them were dedicated to member experiences.

J-WEL's innovative community building model was designed with the premise that: 1) educational change needs to be relevant, contextual, while also scalable; 2) the work needs to be informed by a diverse set of universities with a diverse set of challenges and opportunities; 3) all aspects and stakeholders that make up the core of a university community (faculty, staff, and students) need to be included when the goal is educational transformation; 4) members of the community should make long-term commitments both in funding and time, allowing for both short and long-term goals to be defined and achieved; and 5) a horizontal network needs to be created to ensure leadership perspectives from different contexts and approaches.

We have found the third point noted above to be of particular importance. In many MIT past engagements and in similar consortiums, a particular subset of the university is generally targeted. In order for real change to take place, all stakeholders in the university need to feel ownership, be excited about the potential change, and be knowledgeable about their individual role to generate the change. In the J-WEL model, there are multiple points of engagement for stakeholders each year across the university.

The J-WEL Higher Education collaborative also provides incentive for MIT faculty to engage with global changes in

education by providing annual grant funding to proposals for educational innovations that are applicable on the MIT campus as well as on a global scale. This has been successful in supporting MIT faculty to redesign aspects of their courses, develop new modules, and design outside of class activities, to name a few. As MIT faculty receive a plethora of collaboration requests from global universities, they have ample opportunities to share knowledge gained from their redesign experiences. J-WEL helps with broad dissemination of this new knowledge by creating a single, organized entry point for engagement with MIT faculty. A by-product of this is the reduction of administrative time for other departments on campus to coordinate these liaisons. These contributions drive MIT interest and support for J-WEL, ensuring widespread involvement in J-WEL activities.

IV. CURRENT STATUS

The J-WEL Higher Education collaborative currently has 20 members. These members include both higher education institutions and governments focused on transformation in education. J-WEL members are from Latin America /Caribbean, Africa, South East and South Asia, Oceania, and the Middle East, with the largest cluster of members located in Latin America (as presented in Figure 2). The goals and aims of members vary, although the majority are reimagining engineering education using the MIT pedagogical philosophy.

Although J-WEL was created just three years ago, there are already promising results emerging from member institutions. This is particularly true for those engaged in the redesign and reimagining of the engineering curriculum. Members are enhancing their curriculum with active multidisciplinary project-based pedagogies, framed by an attempt to work on authentic real-life challenges and guided by the U.N. Sustainable Development Goals. The results of their efforts are unique to each participating member based on their local context, but all are moving towards the united goal of improving their educational system.

Fig. 2. Geographic representation of J-WEL members

In the past two years, 45 faculty have participated in two 2-week summer workshops. The workshops are delivered by MIT faculty and staff, and provide the necessary content and support that allows faculty to redesign an existing course or develop a new course in real time. Our follow-up with participants from the most recent workshop revealed that the majority of those who responded to our interview request (66%) had either implemented their course revisions at their respective institutions, or would do so in the upcoming semester. Additionally, some faculty described transfer of pedagogies learned at the workshop to other courses they teach, and also of engaging their colleagues in use of these strategies when they co-taught classes in a course.

To date, a total of 176 senior university leaders have attended twice-annual gatherings to focus on 'reimagining curriculum' and other topics related to the five pillars of engagement. The gathering are focused on educational change at a more systemic and policy scale, thus complementing the ongoing work of the faculty. In recent follow-up interviews with individuals serving as point-of-contact for the memberships, they articulated multiple changes that have been influenced by J-WEL engagement. Curriculum emphasis on skills to solve real world problems and processes to promote entrepreneurship and innovation were frequently mentioned as important take-aways from J-WEL events.

In regards to sustainability it should be noted that, even when members are working on other pillars than the curriculum development, the MIT sustainability guidelines on all levels are also introduced to them through the planned activities.

V. CONCLUSION

The innovation we put forth in this paper provides a framework for a global consortium to ensure meaningful international engagement in higher education with a focus on sustainability. This framework ensures that members carry-out concrete changes in their universities, and also the hosting university (in this case MIT) benefits from this engagement.

We are currently in the process of conducting an outcome assessment for the first two years of J-WEL activity. Early results are promising and point to impact on both the host university campus, as well as member campuses, particularly within course and curriculum redesign.

For our future work, we aim to further connect MIT faculty with the goals and interests of J-WEL members through the grant program. This may include opportunities for joint proposals with MIT faculty and J-WEL member faculty.

Additionally we are continuing to expand opportunities for online engagement for our members. More specifically, our team has developed an online workshop that will be delivered in a series of seminars. During the seminars, participants will experience multiple modes of engagement—there is discussion of content, a hands-on element, development of a final product, and a certificate for completion. The work in this area has been particularly promising and timely, given the necessity to engage virtually following the Covid-19 pandemic.

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