



Development of The Malaysian Skills Certification for Lecturers in Tertiary TVET Institutions

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Abstract: Competency framework is a tool that sets out and defines a list of competencies that is required for a profession. It is a framework that a profession needs to perform their job effectively. This paper discusses a competency framework developed for technical lecturers under the Malaysian Skills Certification (Sijil Kemahiran Malaysia - SKM). TVET lecturers are tertiary level educators who teach practice and application oriented (PAO) based programmes at technical universities. The competency framework was developed using DESCUM (Develop a Standard Curriculum) method. The framework was published as an occupational standard under the National Occupational Skill Standard (NOSS) for TVET Implementation and Development. Nine competency units identified to be critical and important for a TVET lecturer to have are described in this paper. It comprises eight core competency units and one elective competency unit with thirty-four work activities. The work activities cover the roles and responsibilities of a lecturer, namely teaching, research and publication as well as consultation services. It is hoped that the competency framework for TVET lecturers will be a platform to assure the quality of TVET education at tertiary level and improve the Malaysian national higher education and economic landscape in the long run.

Keywords: TVET, competency framework, lecturers, tertiary education

1. Introduction

Strengthening Technical and Vocational Education and Training (TVET) has become a priority and an important national agenda for Malaysia. It has generated intense interest in the education community from secondary to tertiary education level i.e. universities. Beginning from 2011, four of Malaysian public universities have started to offer engineering technology programmes to support TVET agenda. These four public universities are categorized under Focus University type, and to emphasize their association to TVET, they are termed as technical universities. Table 1 shows the categorization of twenty public universities in Malaysia, including the four technical universities.

Malaysian universities under the Department of Higher Education in the Ministry of Education (MoE) are divided into two groups; which are public and private universities. In the Focus University category, four of the eleven members are grouped and named as Malaysian Technical University (previously known as Malaysian Technical University Network (MTUN)). The universities are; Universiti Tun Hussein Onn (UTHM), Universiti Teknikal Malaysia Melaka (UTeM), Universiti Malaysia Pahang (UMP), and Universiti Malaysia Perlis (UniMAP). Initially, these four universities were known as Kolej Universiti Teknologi Tun Hussein Onn (KUiTTHO) (established in 27th September 2000), Kolej Universiti Teknikal Malaysia Melaka (KUTKM) (established in 1st December 2000), Kolej Universiti Kejuruteraan dan Teknologi Malaysia (KUKTEM) (established in 16th February 2002), and Kolej Universiti Kejuruteraan Utara Malaysia (KUKUM) (established in 16th February 2002). These university colleges were initiated based on the Cabinet’s Memorandum established in April 2000.

Table 1- Categories of Malaysian Universities under the Ministry of Education

Research University	Comprehensive University	Focus University
<p>Members: Universiti Malaya (UM), Universiti Sains Malaysia (USM), Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM) & Universiti Teknologi Malaysia (UTM)</p> <p>Criteria:</p> <ul style="list-style-type: none"> • Research-based academic programmes. • Competitive (student) enrollment. • Quality lecturers. • Graduate to Post-graduate ratio is 50:50. <p>Objectives:</p> <ul style="list-style-type: none"> • Increase R&D&C activities. • Increase number of postgraduate and postdoctoral students. • Increase number of Ph.D. holder lecturers. • Establish and enhance center of excellence (CoE) - HICoE • Increase number of international students and world ranking 	<p>Members: Universiti Teknologi MARA (UiTM), Universiti Islam Antarabangsa Malaysia (UIAM), Universiti Malaysia Sabah (UMS) & Universiti Malaysia Sarawak (UNIMAS)</p> <p>Criteria:</p> <ul style="list-style-type: none"> • Variety of programmes. • Competitive enrollment. • Quality lecturers. • Graduate to Post-graduate ratio is 70:30. 	<p>Members: Universiti Utara Malaysia (UUM), Universiti Pendidikan Sultan Idris (UPSI), Universiti Malaysia Terengganu (UMT), Universiti Sains Islam Malaysia (USIM), Universiti Sultan Zainal Abidin (UniSZA), Universiti Malaysia Kelantan (UMK), Universiti Pertahanan Nasional Malaysia (UPNM) Malaysia Technical Universities (MTU) : Universiti Universiti Tun Hussein Onn Malaysia (UTHM), Universiti Teknikal Malaysia Melaka (UTeM), Universiti Malaysia Pahang (UMP), Universiti Malaysia Perlis (UniMAP)</p> <p>Criteria:</p> <ul style="list-style-type: none"> • Focused programmes. • Competitive enrollment. • Quality lecturers. • Graduate to Post-graduate ratio is 70:30.

In the memorandum, IPTA-Second Model (IPTA stands for *Institut Pengajian Tinggi Awam* or Public Higher Education Institution) was introduced to provide industry-based programmes at the tertiary education level. The main reason is to produce professional and high-skilled workers who will be enablers to increase the productivity of the national industry communities, particularly in the engineering and technology field. These technical universities exist to provide holistic practice and application-oriented (PAO) teaching and learning environment. Their curriculum design should be different from other engineering programmes at conventional universities. As a result of this new model of the university, i.e. IPTA-Second Model, its first cohort who graduated from KUTKM was well accepted by the industry. According to the stakeholders i.e. the industry, the students’ set of skills and knowledge are more industry-ready compared to conventional universities’ engineering graduates. The good employability rate of these technical universities graduates is expected. To further increase the public perception towards these industry-based programmes, the government has decided to rebrand these university colleges to technical universities. As mentioned earlier, these

technical universities were first established as university colleges. Later, these university colleges were upgraded to universities i.e. UTHM, UTeM, UMP and UniMAP respectively on 1st February 2007.

The sustainability of Malaysian technical universities is very important, and these universities carry a huge responsibility in producing competent skillful graduates. Lecturers play an important role in achieving the nation's objective. The lecturers have to be competent and efficient to carry out the task given to them by the university. An occupational framework can be an option to train and develop competent lecturers. Quality professional development has been identified as a very essential factor in improving the effectiveness of teaching and learning (Elmore, 2002; Guskey & Huberman, 1995; Hawley & Valli, 1999). An occupational framework ensures professionals to be able to demonstrate adequate expertise, skills, and knowledge in performing their work. The framework can be used to evaluate performance effectively, to identify competency gaps and to properly plan cost-effective intervention and training programmes for the professionals. Several frameworks of teaching competencies in higher education have been defined. In the USA, the National Board for Professional Teaching Standards and Committee on Promoting and Evaluating Teaching Effectiveness (PETE) have put considerable effort into defining teaching competencies. In the Netherlands, VSNU (1996) have made a framework that is specific for higher education (Dineke et al., 2004).

The following section discusses the reasons for establishing a competency framework for technical lecturers under the national skills certification programme called Malaysian Skills Certificate or *Sijil Kemahiran Malaysia* (SKM). This certificate is governed and awarded by Jabatan Pembangunan Kemahiran (JPK) under the Ministry of Human Resources (MoHR). This section highlights the urgency to develop a competency framework for lecturers, especially for tertiary TVET institutions.

Other than technical universities, skills or vocational training institutes are also part of the entities under TVET institution. All trainers at these TVET training institutes must be competent and certified under SKM. To ensure their competency, these trainers are required to be certified with a certificate of Vocational Training Operation (VTO) (SKM Level 3) to be qualified as trainers at these training institutions. This justifies why TVET lecturers need skill qualification as well, and to date, there is no competency framework developed yet for TVET lecturers. The skills qualification under SKM can be attained through three methods which are; attending training courses at accredited training centers, use Recognition of Prior Learning (RPL) where skills are acquired either through employment or previous training and lastly through apprenticeship scheme conducted within an industry and at public skills training institution called as National Dual Training System (NDTS) programme. TVET training institutions require their trainers to pass the VTO assessments to be appointed as permanent instructors at their institutions. This skills qualification continues to Vocational Training Execution (VTE) certificate (SKM Level 4) and finally to the Vocational Training Management (VTM) certificate (SKM Level 5). Currently, MoHR is enforcing all vocational instructors of MoHR's training institutions to have at least a VTO certificate for the trainers to be qualified as instructors. Such regulation is seen to be relevant and acceptable because this will equip the instructors with competencies or skills needed to efficiently deliver their job as training institution instructors.

Technical universities demand their lecturers to be equipped with a different set of skills and knowledge compared to conventional universities. Conventional universities focus more on cognitive learning and do not emphasize hands-on or practical approaches. Their curriculum concentrates on lecturing and most assessments carried out are to examine students' cognitive achievement. Technical universities, on the other hand, employ theoretical as well as practical delivery sessions to most of its academic courses. Most of the course assessments are 50 percent on the cognitive domain, 45 percent psychomotor domain and 5 percent on the affective domain. To deliver these PAO courses well, lecturers are required to have sufficient academic as well as skills qualifications to support their teaching skills and to meet the needs of students in the classroom. It is important for them to frequently update their skills and knowledge on the latest technology as well as pedagogy skills for their teaching competency. The ability to recognize students' learning style, implement effective teaching methods, assess students' performance in different domains, prepare impactful teaching materials are some of the abilities that a technical lecturer needs to own. In teaching, they need to be able to bridge between cognitive and hands-on components in their delivery for the students who mostly graduated from vocational schools and technical colleges.

Currently, at technical universities, lecturers' working experience background can be divided into two categories. The first category is lecturers who have working experience with the industry however do not have postgraduate academic qualifications. On the other hand, the second category of lecturers has postgraduate academic qualifications. However, they do not have any working experience with the industry. Regardless of any background, a technical lecturer is expected to have good networking with the industry, i.e. give consultation on a particular field, secure research grant and perform research and development work. These qualities show that technical lecturers should have the ability to conduct research and work collaboratively with stakeholders such as the industry. Technical lecturers should work closely with the industry, either in research and development of a product or in improving services. Other than that, technical lecturers should also have the ability to write and publish, as the core business of a university is to generate and disseminate new knowledge.

All of the above are the critical competencies required for technical lecturers. The different academic and experience background and challenging work demands suggest a different frame of reference and require an intervention programme to close the competency gaps. Lecturers need a comprehensive competency framework that

could assist them on career performance, career development and promotion. In the context of MTUN, this study aims to answer the following questions: -

- What are the job descriptions of a technical university lecturer?
- Is DACUM an appropriate, comprehensive and effective technique to identify job descriptions of a technical university lecturer?
- What are the competencies required for a technical university lecturer?
- Is it possible to certify a competent technical university lecturer with Malaysian Skills Certificate?

Proposing an occupational standard for TVET lecturers as their competency framework is a viable solution for technical university academicians. This paper proposes a competency framework for technical university lecturers under the national skills certificate system (SKM). This skills certificate system is governed by the law under the National Skills Development Act 2006 (Act 652). It is an Act which focuses on education, vocational guidance and training. The purpose of the Act is to promote, through skills training, the development and improvement of a person’s abilities, which are needed for any vocation. Therefore, the proposition to introduce a competency framework for a technical lecturer is more than appropriate and should be taken into serious consideration by the stakeholders.

On the other hand, the reason for implementing the competency framework using SKM is because, in the Malaysian Qualifications Framework (MQF), TVET graduates (under the Skills and Technical & Vocational pillars) are all qualified with SKM. Table 2 that shows the current MQF, illustrates that graduates of TVET institutions (i.e. qualified with SKM Level 5) are possible to be feeders to universities including technical universities). Understanding the SKM system will benefit a technical university lecturer. This is important because the lecturer’s awareness of the TVET context will guide the lecturer on how to adopt and adapt the student’s past learning experiences in learning new information at the university level. Lecturers will be able to accommodate the diversity of TVET students and be able to reflect critically. Therefore, proposing the competency framework for technical lecturers to be qualified under SKM will engage the technical lecturer to TVET ecosystems, and not isolated from it.

As a current, written details of the lecturer’s duties, tasks, job functions and responsibilities are described in conventional work manuals. However, these manuals do not elaborate or detail out the work activities involved, and they do not specify the set of skills and knowledge required by lecturers to perform the task well. National Occupational Skills Standard (NOSS) is the main document in SKM certification. NOSS documents have advantages over conventional work manuals as the work activities are divided into smaller levels in the documents. The advantage of adapting and/or adopting NOSS to qualify a worker is that NOSS helps workers to understand their job scope to meet employers’ expectations. NOSS also enables employers to have more structured and effective training programmes that could save the employer’s training expenditures and time. Moreover, the NOSS-based competency framework could produce training programmes that are more objective to produce competent workers, or in this case, competent lecturers.

Table 2 - The current Malaysian Qualifications Framework (MQF) (MQA, 2011) and the Proposed MQF (EPU, 2015)

Level	Current MQF			Proposed MQF	
	Skills	Vocational & Technical	Higher Education	TVET	Academic
Level 8			Doctoral	Doctoral	Doctoral
Level 7			Masters	Masters	Masters
Level 6			Bachelors	Bachelors	Bachelors
Level 5	Adv.Diploma	Adv.Diploma	Adv.Diploma	Adv.Diploma	Adv.Diploma
Level 4	Diploma	Diploma	Diploma	Diploma	Diploma
Level 3	Skills Certificate 3		Certificate	Skills Certificate 3	Certificate
Level 2	Skills Certificate 2	Vocational & Technical Certificate		Skills Certificate 2	
Level 1	Skills Certificate 1			Skills Certificate 1	

In the Eleventh Malaysia Plan (RMK-11) 2016-2020, Strategy Paper 9 listed four issues and challenges in TVET; (i) Uncoordinated governance of TVET, (ii) Fragmented TVET delivery in Malaysia, (iii) Lack of recognition for technologists, and (iv) Competency gaps among instructors (EPU, 2015). In Strategy Paper 9, the government through Economic Planning Unit (EPU) has suggested having only one quality governance body, which comprises JPK and MQA, that is responsible for the accreditation of all TVET programmes. This is shown in Table 2 that demonstrates the proposed MQF for TVET qualifications. This means JPK will also be involved in accrediting tertiary TVET programmes. By involving JPK at the tertiary level and MQA as its accreditation body partner, this will gradually shift

TVET into a different perspective. Single accreditation bodies will make the coordination and collaboration among TVET providers at secondary and tertiary levels, manageable. It is anticipated that the proposed competency framework could be a stepping stone to realize the single accreditation and vice versa.

2. Methodology

The objective of this empirical research is to develop a competency profile for Malaysian technical university lecturers. The development of the profile involves processes that are standard procedures in developing an occupational standard by JPK. Participants of this research involve various parties. According to Jan, some findings say the data from the job supervisors could have been less valid than the data from the job incumbents (Jan and Graham, 1989). Therefore, to have a comprehensive and accurate job list, this research agrees to involve job incumbents and not supervisors. This is in line with the philosophy of occupational framework development by JPK. The framework is prepared by a pool of professionals who carry out the job using DACUM technique. Furthermore, DACUM is proven to be one of the effective and comprehensive techniques to perform job competency analysis other than other methods (Jan and Graham, 1989).

NOSS is a document that outlines the dexterity required of an employee working in Malaysia at a certain level of employment to achieve specific skills. There are several methods involved in developing the occupational framework for TVET lecturers using NOSS procedures.

- i. Occupational analysis
The first stage was to identify needs in developing a training or professional development programme framework for lecturers. Initially, the need analysis was conducted through a series of focus group discussions and interviews with identified stakeholders. The discussion was held among the FTK lecturers of UTeM, ten FTK programme coordinators, and also a workshop attended by lecturers and professors of the technical universities. Through these discussions, it was found that a structured training framework is required in order to develop the technical lecturers' competencies systematically and effectively.
- ii. Job analysis using DESCUM
The second stage was to get JPK's agreement to develop the NOSS and to conduct three series of workshop sessions to develop the NOSS documentation according to JPK procedures. Once the application to develop NOSS was approved, JPK appointed five to twelve "job experts" personnel as NOSS Development Committee members who were responsible in developing the occupation standard. The committee members attended the development workshops and were involved in completing the Job Analysis and Competency Profile Analysis mostly through brainstorming activities. This process is called as DACUM or DESCUM. It is important to have trained DESCUM facilitators from JPK to coordinate the workshops and to manage the NOSS documentation as well.
- iii. Derivation of lecturers' duties and tasks
In Job Analysis activity, the members managed to highlight the required competency units for a TVET lecturer. In Competency Profile Analysis activity, for each Competency Unit (CU), committee members have categorized and listed the work activities involved as well as its performance criteria in order to describe that work activity in detail. Detailing of each work activity is important in NOSS to avoid misinterpretation. This is because NOSS will be used by expert trainers to design training syllabus called Written Instructional Materials (WIM). Well-described work activities will guide the trainers to design well-suited training syllabus that will lead to effective training programmes. Findings from these workshops were compiled by the JPK facilitator and then documented properly.
- iv. Validating the results of job analysis
Finally, the third stage was to verify and vet these results through Curriculum Validation. The NOSS document were validated by Standard Technical Evaluation Committee appointed by JPK. Among the committee members were the Director of Academic Development Management Department of MoHE and the Deputy President (Academic and Technology) of UniKL.

3. Results, Discussion and Recommendation

Generally, DESCUM was developed based on three logical premises. First, expert workers can describe and define their work/occupation more accurately than anyone else. Second, an effective way to define an occupation is to precisely describe the tasks that expert workers perform. The third premise is that all tasks in order to be performed correctly require the use of certain knowledge, skills, tools and positive worker behaviors. The duties and tasks of a technical lecturer or professional development plan for a technical lecturer was successfully identified and documented as one of the occupation standards under NOSS of JPK. In the development process, it was observed that DESCUM was successfully used to effectively and critically analyse the technical lecturer occupation work and duties. DESCUM involves several analysis phases which consist of occupational analysis, task verification analysis and task analysis process.

Using DESCUM, there are several advantages observed during the development process. Through the process, committee members freely shared ideas and hitchhiked on each other’s contributions. Further, the brainstorming processes were used several times throughout the development to maximize possibilities i identifying all of the duties and tasks. An experienced and trained DESCUM facilitator is very critical and crucial to ensuring the process to be properly executed. Along the process, it was observed that a facilitator played an important role to ensure group synergy and consensus. A facilitator has to guide the members to assess each contribution and refine it until agreement among members was reached. The members who are also the expert workers, need to be guided as well as motivated throughout the development process as the development work was tedious and need to go through several rigorous assessments.

Table 3 - CPC of NOSS title TVET Implementation and Development

Competency Unit (CU)	CU Code	CU Title
Core	C01	TVET Curriculum Planning and Development
	C02	TVET Curriculum Delivery
	C03	TVET Curriculum Evaluation
	C04	Academic Advisory
	C05	Industrial Planning and Project Supervision
	C06	Technical and Research Innovation
	C07	Technical or Professional Services
	C08	Workshop and Laboratory Management
Elective	E01	Faculty Leadership and Management

The Competency Profile of NOSS for TVET lecturers was approved and categorized under the Education Sector, Higher Education Sub Sector. The NOSS title is TVET Implementation and Development. It outlines nine competency units that a lecturer has to achieve to be certified as a skilled and competent TVET lecturer. Table 3 shows the Competency Chart Profile (CPC) of the NOSS. This chart tabulates the eight Core Competency Units and one Elective Competency Unit of NOSS (TVET Implementation and Development NOSS, 2017).

Competency Profile (CP) of NOSS details each CU of CPC. This CP document is the most important part of NOSS as it itemizes and specifies CU into CU Descriptor, Work Activities (WA) and Performance Criteria for each WA. For example, C02 which is TVET Curriculum Delivery has its CU Descriptor as shown below:

“TVET Curriculum Delivery is described as a process of preparing, conducting theoretical and practical learning activities as well as assessment assisted by technological tools and applications to attain learning outcomes of TVET academic programmes. Effective teaching and learning could provide learning opportunities for students to analyse, criticize, construct, reflect and evaluate their learning process. Competent technical lecturers are expected to be able to deliver theory, applied knowledge (practical) and assess teaching and learning effectively which are in line with industry and business needs.”

- Under C02 *TVET Curriculum Delivery* competency unit, there are six work activities listed. They are: -
- WA1. Prepare teaching and learning materials
- WA2. Conduct a theoretical session
- WA3. Conduct a practical session
- WA4. Conduct theoretical assessment of/for learning
- WA5. Conduct practical assessment of/for learning
- WA6. Integrate technology in teaching and learning

In the NOSS document, there are thirty-four WAs listed out for the nine competencies that a technical lecturer should perform. For each WA, there are a list of performance criteria which later will be employed for assessment and evaluation purpose of the competency framework. If the single accreditation system as shown by Table 2 (Proposed MQF) are realized, technical university academic programmes will be accredited by JPK and MQA. If so, then it is time for technical universities to commence engagements with JPK. JPK will be part of the accreditation council to govern all TVET programmes including tertiary level education programmes as planned in Strategy Paper 9. The development of TVET lecturers NOSS will become a platform for many more future potential engagements to improve and mainstream TVET. The developed competency framework is anticipated to be able to build the capacities and competencies of teachers, lecturers, managers, trainers and facilitators to initiate and enhance new culture as well as new environment in order to reform new forms of TVET learning from secondary education level to universities, workplaces and industries. The nine competencies addressed in the NOSS document will be further detailed and designed at lecturers' training institutions to suit the needs.

Through the training programmes developed based on the competency framework, lecturers should be able to implement effective teaching tools in TVET to promote human capital development such as critical thinking and problem-solving skills as well as creativity and innovative skills. All teaching techniques should be designed to suit learner's characteristics, meet their needs and develop their interest and enthusiasm. Teaching technique should also be shifted away from lecturing and move towards group-work, self-study and methods which use active involvement of the class. Curriculum development competencies among lecturers should be given a priority as this is the channel for the lecturers to design new courses to meet industry demand and to design elective courses or subjects suited to the students' own personal and professional needs, interests and job opportunities (MH Abdul Halim, et al., 2014; A. Butle & Matt Loble, 2016). TVET lecturers should also be capable to carry out effective laboratory sessions to increase learning experience for both students and demonstrators (S.Nikolic, et al., 2015). Conducting demonstrations in a laboratory is very different from teaching in a lecture or tutorial, as a wider range of technical skills is required by the lecturer. A lecturer should be able to produce effective and clear laboratory activities and choose quality laboratory equipment to increase students' satisfaction in laboratory learning sessions (S.Nikolic, et al., 2016).

Interestingly, the developed competency framework for TVET lecturers is seen to have the capability to address competencies that are critical for TVET lecturers as discussed by Miranda (2015), such as understanding of the TVET context including the policy environment, use of information and communication technologies, understanding and accommodating the diversity of students, ability to reflect critically and being knowledgeable about what industry and business need. To improve the lecturers, regulated and structured continuous professional development programmes need to be developed and formalised to enable lecturers to reskill and upskill their competencies not only in teaching but also in academic research as well as performing consultation work to enhance their professionalism (Miranda, 2015).

Another way to improve lecturers' competencies beyond training sessions is that lecturers should be provided with career development supports by their supervisors, including mentoring and career counseling as well as workplace learning opportunities through processes of job enrichment and job rotation (M. Martini & D.Cavenago, 2017). A variation in training approaches could also be a factor to its success. For example for the younger generation lecturers, the training preference should be more towards leveraging technology and for more senior lecturers, they are more comfortable with the on-the-job and mentorship development efforts rather than formal approaches (Micheal Urick, 2017).

4. Conclusion

Generally, this study aims to analyze the job of technical lecturers. The competency framework for TVET lecturers is developed through a series of DESCUM workshops. It is documented as an occupational skills standard known as NOSS. The document was published in 2017 and listed as one of the standards in the NOSS registry. The competency framework development process started with a job analysis session that was facilitated by trained and experienced facilitators. The NOSS or competency framework for technical lecturers was successfully developed, documented and registered as one of the country's referred competency standards for technical lecturers. As the development process involved critical job analysis, the standard can identify all the tasks and duties a competent technical lecturer should have. Based on the framework, TVET lecturers will be able to improve their competency in practice and application-oriented (PAO) teaching as well as in research and consultation services. Through the competency framework, TVET lecturers will be able to be competent in conducting product-based research, performing consultation work with industry partners and servicing the community based on their technical or non-technical expertise and capabilities. The changing role of TVET educators involves 'linking occupationally related (academic) studies with technical subjects'. All these suggestions to broaden the role of TVET lecturers require changes in the way lecturers are educated in their pedagogical courses (UNEVOC, 2017).

This research is important because the proposed competency framework can be used as a guideline for policymakers or top management for the human resource development of tertiary TVET institutions. The proposed framework in this paper can educate and train TVET lecturers to become the agent of changes of higher TVET. It is hoped that MTUs, as well as other technical universities or higher TVET institutions, will adapt or adopt the competency framework and apply it as one of the institutional strategies in revitalizing the TVET ecosystem of public higher learning institutions.

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