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Knowledge Transfer in UAE Higher Education Institutions During Covid-19 Pandemic: Learners' Cannot Learn Surgery by Watching

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***Abstract*— Purpose – This study aims to explore various methods of knowledge Transfer (KT) in the UAE Higher Education Institutions (HEIs) (both pre and post COVD-19 pandemic) and to measure the satisfaction level of instructors and students towards these methods. This study also aims to identify the type of learning most and least supported by online KT process and to identify the challenges faced by instructors and students while using the online KT process during COVID-19 pandemic. The study revealed that more than 92 percent of both students and instructors expressed their satisfaction with the knowledge transfer methods introduced by higher education institutions in the UAE. The outcome of the research is worthwhile for both Emirati and foreign higher education institutions, which are operating in the UAE and even in the middle east, to promote their academic programs in their respective markets during and after the Covid-19 pandemic. This paper provides a through insight for the policy makers at higher institutions in UAE for considering online mode as a substitute/simultaneous approach for knowledge transfer.**

Keywords— Knowledge Transfer, Higher Education Institutions, Covid-19, United Arab Emirates (UAE), Online Learning.

I. INTRODUCTION

The spread of coronavirus, COVID-19, has generated a crisis situation in the civic, economic, political, and organizational milieu of the entire globe. There is no exception to any country in the world, including the UAE. As governments (federal, state, and local) make every effort to protect the public, the economy, and their essential workforce, entire industries are scrunching, and families are locked down in their homes trying to rearrange work and domestic commitments on remote and as best they can. It is apt now to recall the former British Prime Minister Benjamin Disraeli famously said words "the more extensive a man's knowledge of what has been done, the greater will be his power of knowing what to do." The knowledge management and its transfer are crucial in the current situation due to the swift crumbling of markets and economic situations of individuals/families and companies. The knowledge transfer (KT) is most critical to every business's success because, when done effectively, it enriches the efficacy and productivity of any organization. The existing pandemic situation essentially has forced all the businesses to review their knowledge requirements and ready to identify diverse knowledge transfer sources, tools, and techniques to enhance their business handling in uncertain conditions. The knowledge transfer is a proverbial passing of the torch – it is the process of imparting important information from one part of the business (or person) to another. As a critical service sector extensively involved in knowledge transfer, higher education institutions (HEIs) have an obligation to transfer knowledge to all the stakeholders, which include the business, industrial and education sectors as well as broader communities, in order to support economic development [1, 2; and 3]. Knowledge transfer as a primary and imperative commitment and core mission of HEIs, which are anticipated to generate knowledge assets through doing research and development actions and disseminating the knowledge to the students or learners. During the Covid-19 pandemic, designing and improving more suitable and user-friendly knowledge transfer tools and techniques enriches the global competitiveness of the higher education sector and their research facilities through feedback from knowledge stakeholders. Despite an increasing emphasis on KT within HEIs, precisely how that knowledge can be effectively transferred to stakeholders and recipients has not yet received sufficient attention [4]. Keep in mind the socio-economic value to be delivered as a primary obligation of HEIs, and there are a good number of reasons for which effective KT practices need to be put in place in HEIs; a core justification is that doing so will be advantageous to diverse stakeholders in this Covid-19 pandemic. This study aims to identify the opinions of both the UAE higher education students and instructors involved in the knowledge transfer process to know the effectiveness of the tools and techniques implemented and the challenges faced in the existing Covid-19 pandemic.

II. LITERATURE REVIEW

Knowledge transfer (KT) describes to sharing or disseminating of knowledge and offering inputs to problem-solving. KT pursues to manage, generate, obtain, or distribute knowledge and confirm its accessibility for potential users. knowledge transfer is defined as "the process through which one unit (e.g., group, department, or division) is affected by the experience of another [5]." Knowledge transfer is a process in which knowledge is transferred from knowledge holders to knowledge recipients [6][7]. Traditionally, the higher education sector is always actively involved in synchronous knowledge transfer. The knowledge to be transferred should be fully aware by the recipients [8 and 9] and related to their needs [10]. After completing the knowledge transfer process, receivers should be improved to apply the earned knowledge circulated by the source [11 and 12]. Hence, the activities of knowledge transfer consist of knowledge dissemination across organizations [13] and encompass a broad range of activities supporting mutually beneficial collaboration between HEIs, businesses, and the

public sector. Knowledge transfer should then be a closed-loop transmitting process of knowledge between the higher education institutions and society [14] to emphasize the link between research and training [15]. Recognizing the knowledge and making inquiries about the knowledge source/s are vital for beginning the knowledge transfer process [16 and 17].

Higher-education institutions consist of not only universities and colleges but also a variety of professional schools that offer preparation in such disciplines as law, theology, medicine, business, music, and art. Higher education also includes teacher-training schools, junior colleges, and institutes of technology [18]. Higher education institutions should develop the knowledge attentiveness of their recipients to discern the value and role of specific knowledge for an organization's successful performance [19]. Establishing a task force unit in recipients' organizations to pinpoint the knowledge will enable them to be more cognizant of its potential value and acquire it [20]. Once the knowledge for use is identified, recipients must seek ways to acquire it from external agents to fix an existing problem or innovate in performance for competitive advantage [21, 22, and 23]. In the business world, knowledge is a crucial asset and a source of competitive advantage [24]. Companies that follow innovation and knowledge management as principal business strategies create both intellectual capital and shareholder value faster than companies that do not [24, 25, 26 and 27]. Hence, organizations can enthusiastically improve learning capabilities, generate, and maintain the knowledge implanted in their organization. Doing so accepts these firms to recognize more efficient organizational processes associated with financial performance [28]. Even though higher education institutions are extensively involved in the knowledge process, the corporate sector also has continuously been involved in the knowledge dissemination process by establishing training and workshops because of the changes taken place in the policies, plans, procedures, technologies, programs, and budgets. Training programs and workshops are effective ways for organizations to acquire knowledge [29, and 30], and these are general approaches adopted by businesses and industrial organizations to acquire knowledge from [31]. Most corporates have continuous interaction with the world-leading higher education institutions to collaborate in the knowledge transformation process with mutual benefits. In the instructors' committed and responsible knowledge transfer process, the researchers thought that it is apt to discuss the contextualized teaching and learning (CTL) [32]. CTL is a process built on recognizing that some students learn more effectively when taught in a hands-on, real-world framework rather than in an abstract manner [33, 34 and 35]. Knowledge contextualization includes the practice of knowledge transformation and association. Knowledge transformation converts the acquired knowledge into new knowledge [36 and [37] [38]. The consultancy type of knowledge transfer that helps organizations to evaluate match, associate, and incorporate the knowledge for the appropriate application so that it meets their internal needs [39, 40 and 41]. All through offering a consultancy service, higher education institutions (HEIs) could assist recipients to compare and relate the knowledge to the organization's internal needs. In the knowledge transfer process, the most vital and essential stages are knowledge internalization and knowledge externalization. Knowledge internalization is the practice of learning the knowledge, acquired in new situations, to adjust direction, solve problems, improve efficiency, and reduce costs [42 and 43]. Harnessing knowledge through transforming and contextualizing lessons learned from previous cases, mistakes, and experiences, to adopt best practices in daily operations, could help recipients internalize it [44]. The work-based analysis is an efficient KT approach for organizations to apply the knowledge produced by HEIs [45 46]. The knowledge possessor can initiate a work-based study in collaboration with the receiver to apply the knowledge and encourage innovation, problem-solving, and competitiveness. Knowledge externalization is transforming collective tacit knowledge into explicit knowledge [47]. It is an organizational capability to validate the freshly grasped knowledge to the knowledge holders through carriers of explicit knowledge such as documents, written reports, or oral presentations [48]. Formulating the recently created knowledge as a concept or concepts to the knowledge holders can help recipients evaluate how efficient the KT process is [49 and 50]. Knowledge externalization is achieved through professional dialogue and collective reflection among members, leveraging, and codifying best practices and lessons learned through explicit knowledge [51 and 52]. Seminars and oral presentations are useful for knowledge externalization between HEIs and industries [53 and 54]. The knowledge transfer process comprises two critical stages the transmission and absorption of knowledge. Knowledge absorption is the procedure through which the receivers internalized the knowledge of the senders, which is a vital determining factor of the effectiveness of knowledge transfer [55 and 56]. Absorptive capability is influenced by staff competencies, knowledge-sharing culture, and organizational policy communication [57]. Trust, communication, and intermediaries and experiences are noticed as facilitators for KT that support to augment the adsorptive power (58 and 59]. The indicators accepted in the study for measuring the absorptive capacity comprise knowledge vision, knowledge leadership staff competencies, knowledge-sharing culture, organizational KT policy, and IT infrastructure for communication with the knowledge recipient's organization [60 and 57].

A. Knowledge Transfer in Higher Education Institutions (HEIs) in the UAE:

Conventionally, higher education institutions have long-held civic obligations toward the broader society, which envisages higher education to develop competent citizens who contribute to social welfare and productivity [61]. The UAE government has paid fantastic attention to advance the education process for bringing up a well-educated generation who can keep up with the pace of scientific development and technical revolution, where, today, the number of licensed scientific institutions reached 76 (active institutions 71 only) providing 1,032 accredited different education programs in many various scientific and literary fields, specialties and different academic degrees. All these institutions are supervised and coached by the commission for academic accreditation [62]. Shadowed his ancestor's approach, which was deep-rooted and strengthened by his highness Sheikh Mohammed bin Rashid al Maktoum, Vice –President and Prime Minister of United Arab Emirates, and Emir of Dubai, by making education a priority of the government's strategy, and to consider the education is a vital pillar of the strategic plan of the state. The strategic plan of the Ministry of Higher Education and Scientific Research aims at creation higher

education in the vital spot through designing an idiosyncratic educational environment which offers the resourceful and modest staff internationally, as it aims at contributing to initiating the knowledge and sustainability community through offering programs and education services according to the highest standards and excellence where many of those institutions have got the international accreditation for their programs, which show its importance and significant position [63]. The ministry initiated this philosophy in line with the sustainable development goal number four, i.e., ensure inclusive and equitable quality education and promote lifelong learning opportunities for all [64]. The UAE higher education institutions can be divided into public, private, and global partnerships. A wide range of private institutions also offering diverse academic programs with international accreditations in a supplement to the public sector and under[65]. Even in the existing drastic situation of Covid-19 pandemic, the UAE's Ministry of Education persistently introducing a wide range of quality-conscious approaches to maintain the global quality standards of each of their academic programs under all three kinds of higher learning institutions with the help of their control mechanism [66]. As a quality knowledge transfer process of the entire higher education sector of the country, all the stakeholders of the sector like students, graduates, their families, and the UAE public can be convinced that licensed institutions and accredited programs will provide the quality of higher education that they expect and deserve.

The above discussion is advocated theoretically by the positive relationships between the demographical factors chosen for the study and other knowledge transfer variables based on which the subsequent hypotheses are thus proposed.

H1: The field of study has a significant impact on the overall KT process satisfaction of instructors of HEIs in the UAE.

H2: Education level has an influence on the KT method satisfaction levels of students.

H3: The field of study significantly impacts the overall KT process satisfaction of students of HEIs in the UAE.

H4: The options of the KT method during COVID-19 pandemic has a significant impact on the overall satisfaction levels of the student community.

H5: The impact of the online KT method(s) has a significant impact on the satisfaction among students in the UAE.

H6: The diversity of elements in the KT process to be improved have a significant impact on the satisfaction of students.

H7: problems in the KT system significantly affect the overall satisfaction of the learning community.

III. METHODOLOGY

The researchers employed a three-part, closed-end questionnaire with seeming options in every part. A five-point Likert-type scale was used in most parts of the questionnaire. Based on the pilot survey responses, researchers introduced changes in the questionnaire to understand the subjects better. The research targeted all the seven Emirates of the UAE using the convenience sampling technique. Data of 176 students and 67 instructors was collected from different HEIs. The collected data was formulated and evaluated statistically, applying the R language in R Studio. The dependent variable in the data, both students and faculty satisfaction levels of the knowledge transfer method, provides a critical path for analysis in the research. The independent variables were analyzed and tested for their significant impact on the dependent variable, final satisfaction levels on the knowledge transfer process based on diverse methods, complexities, challenges involved, and chosen demographic variables for the study. The Cronbach's Alpha and the Kaiser-Meyer-Olkin (KMO) tests were employed to check the internal consistency and validity of the questionnaire, and then the factor extraction method Principal Component Analysis (PCA) was used to analyze the data. The selected hypotheses were tested using the Kruskal-Wallis (K-W) hypothesis testing technique.

A. Reliability and validity tests

The researchers confirmed the reliability and validity of the questionnaire by employing both Cronbach Alpha and Kaiser-Meyer-Olkin (KMO) tests by using the sample of 50 students and faculty of the HEIs of the UAE. Based on the positive results of the reliability and validity tests, the researchers collected the opinions of 176 students and 67 faculty who are studying and working in different HEIs in the country. The Cronbach alpha (α) is the most used measure of internal consistency reliability [67]. The instrument administered for data collection in the study has Cronbach's Alpha (α) value of 0.81. The result of the KMO test for the overall model consists of variables is 0.79, which proves that the data adequate and eligible for implementing PCA. The lower the percentage, the more suited the data is to factor analysis [68]. The dimensionality reduction technique, Principal Component Analysis (PCA), was implemented. The results of the PCA from PC 1 to PC 5 were analyzed using the Kruskal-Wallis hypothesis testing technique. Table 1 provides the details of the same.

TABLE I. DETAILS OF CONSIDERED DIMENTION IN PRICIPLE COMPONENT ANALYSIS (PCA)

Principal Components	Eigenvalue	Variance Percentage	Cumulative Variance Percentage
Dimension 1	4.519762	29.643816	21.26569
Dimension 2	3.743684	24.574362	54.21817
Dimension 3	2.128493	11.135621	65.35379
Dimension 4	2.797318	4.247631	69.60143
Dimension 5	1.248135	3.243281	72.844711

Source: Research findings (N=243)

The collected data was prepared to test and determine the driven seven assumptions by administering the Kruskal-Wallis (K-W) hypothesis testing technique in the study. The K-W test, also termed a one-way Analysis of Variance (ANOVA), test whether samples derive from the same distribution in the data [69].

IV. RESULTS AND DISCUSSION

The demographic profile of respondents included both students and instructors with age, gender, education, the field of study, and their emirate of studying, working, or living. Even in normal conditions, around 14 percent of students and 12 percent of instructors favored online and blended modes of knowledge transfer. Simultaneously, 25 percent of students and 34.33 percent of instructors opted for a blended model of knowledge transfer in the existing Covid-19 situation. Below, Table II presents the respondents'

preference over the mode of knowledge transfer both in regular conditions along with Covid-19 pandemic situation.

TABLE II. DEMOGRAPHIC RESPONDENTS PREFERENCE ON MODE OF KNOWLEDGE TRANSFER IN NORMAL AND COVID-19 CONDITIONS

S. No.	Mode of KT	Students N=176		Instructors N=67	
		Regular Conditions	Covid-19 Pandemic Conditions	Regular Conditions	Covid-19 Pandemic Conditions
1.	In-class	151 (85.79%)	03 (1.70%)	59 (88.06%)	00
2.	Online	21 (11.93%)	129 (73.30%)	03 (4.48%)	44 (65.67%)
3.	Blended (Both Online & In-class)	04 (2.27%)	44 (25.00%)	05 (7.46%)	23 (34.33%)

Source: Research findings (N=243)

The UAE higher education institutions (HEIs) are widely using the web-based knowledge transfer tools like Blackboard and others with 42 and 39 percent as per the opinion of students as against just 11 percent by Canvas, and 8 percent by Blackboard Ultra. Around 73 percent of students and 75 percent of instructors feel comfortable with the knowledge transfer tools and techniques used by their respective institutions as against around ten (10) percent of both categories of respondents are in an uncomfortable zone. The researchers raised a question especially to students on skills or knowledge learned during knowledge transfer sessions of their institutions. Exactly 86.40 percent of student respondents thought they are competently learning technical and conceptual skills and just a scanty 13.60 percent human, diagnostic, and practical skills. Around 75 percent of both students and instructors agreed that web-based knowledge transfer tools introduced by their institutions have a significant impact on them in the process of knowledge acquisition. Approximate 70 percent of UAE students and instructors accepted that web-based knowledge transfer systems of the institutions have led to gain new insights or ways of looking people and processes, and about ten (10) percent were not accepted in this regard. During the existing Covid-19 situation, the academia of the world in general and UAE higher institutions introduced online and hybrid or blended approach with both online and in-class. Concerning the above, 63.63 percent of students and 68.66 percent of faculty expressed their contentment over this issue against 10.23 percent of students, and 16.42 percent replied with discontentment. Simultaneously, 21.14 percent of students and 14.92 percent of faculty are in the middle-road with wavering opinions in this matter. Related to the existing knowledge transfer tools and techniques change or improvement, and modifications, around 80 percent of faculty demands change in teaching method or process, uploading of course material, and assignments, and evaluation system in the existing learning process. At the same time, around 75 percent of UAE students are demanding change or improvement in teaching methods, quality of video/audio systems, and assignment/evaluation system of the knowledge transfer method of higher institutions. Finally, 83 percent of instructors in the UAE higher institutions identified challenges in practical method of teaching, problem-solving, and experimentation, quality of the Internet, and video/audio, feeling boredom and fatigue, missing close supervision and guidance, lack of human touch, and interaction, and difficulty in using web-based knowledge transfer system. Simultaneously, around 76 percent of students acknowledged problems like feeling online classes are boring and increase fatigue, flawed audio/video system, lack of close supervision and guidance, along with the Internet-related technical glitches.

Based on the hypotheses chosen for the research, the following conclusions derived by the researchers are presented in Table III. Instructors and students overall are satisfied towards the knowledge transfer process generally and online KT process during COVID-19 pandemic.

TABLE III. RESULTS OF HYPOTHESES TESTING

Null & Alternative Hypothesis	Proportionality Test Result	Interpretation
H1: The field of study has a significant impact on the overall KT process satisfaction of instructors of HEIs in the UAE.	K–W Chi-Squared value: 5.3339 P-Value: 0.0209	Since the P-value is statistically significant (<0.05), the null hypothesis (H0) is rejected. Thus, the field of study has a significant impact on the overall satisfaction levels of instructors on the KT process
H2: Education level has an influence on the KT method satisfaction levels of students.	K–W Chi-Squared value: 0.31 P-Value: 0.5731	Since the P-value is not statistically significant (>0.05), the null hypothesis (H0) failed to get rejected. Thus, education does not have a substantial influence on the general satisfaction levels of students on the KT method.
H3: The field of study significantly impacts the overall KT process satisfaction of students of HEIs in the UAE.	K–W Chi-Squared value: 3.94 P-Value: 0.04699	Since the P-value is statistically significant (<0.5), the null hypothesis (H0) is rejected. Thus, the field of study has a considerable effect on the complete satisfaction of students at the knowledge transfer activities of higher education institutions in the UAE.
H4: The option of the KT method during COVID-19 pandemic has a significant impact on the overall satisfaction levels of the student community.	K–W Chi-Squared value: 5.0557 P-Value: 0.02454	Since the P-value is statistically significant (<0.5), the null hypothesis (H0) is rejected. Thus, the preference of the KT method during Covid-19 has a striking impression on the overall satisfaction levels of the student community.
H5: The impact of the online KT method(s) has a significant impact on the satisfaction among students in the UAE.	K–W Chi-Squared value: 15.456 P-Value: $8.46*e^{-5}$	Since the P-value is statistically significant (<0.5), the null hypothesis (H0) is rejected. Thus, the impact of the KT method (s) has shown a remarkable impression and satisfaction among students in the UAE, both regular and Covid-19 conditions.
H6: The diversity of elements in the KT process to be improved has a significant impact on the satisfaction of students.	K–W Chi-Squared value: 8.44 P-Value: 0.0366	Since the P-value is statistically significant (<0.5), the null hypothesis (H0) is rejected. Thus, the diverse elements in the KT process to be improved have a significant impact on the satisfaction of students.
H7: Problems in the KT system significantly affect the overall satisfaction of the learning community.	K–W Chi-Squared value: 7.4988 P-Value: 0.00617	Since the P-value is statistically significant (<0.5), the null hypothesis (H0) is rejected. Thus, different problems in the KT system significantly affect the absolute satisfaction of the learning community.

Although the respondents have mentioned some challenges the KT during COVID -19 pandemic, including internet related problem, time related problem, lack of human touch, lack of direct supervision Another perspective used to conclude this hypothesis was about the kind of knowledge transferred using online medium. As per the views of Sciences and engineering community, the post COVID online or blended mode of knowledge transfer lacks transferring the practical and diagnostic skills of study because of the extensive knowledge transformation through practical, experimentations, and laboratory sessions. The basic sciences and engineering learning community strongly uttered with a statement "learners cannot learn surgery by watching and listening" which means demanding outrightly practical lab oriented experiments, and workshop-based teaching is a must to enhance the learning experience among learners. In contrast, the situation is quite different in the social sciences and business courses knowledge transfer. Even the students from these basic sciences and engineering fields of study also stated a similar opinion. Thus, the field of study has a significant impact on the overall satisfaction levels of instructors and students on the knowledge transmission process of the UAE. The same has been supported with hypotheses 1 and 3 with appropriate values. Whether the students are studying undergraduate or postgraduate programs, education does not have a substantial influence on the satisfaction levels of students on the knowledge transfer method of an institution, which proved with hypothesis two. Because of the terrifying situation spread in the society with Covid-19 pandemic, current knowledge transfer modes has led to a striking impression on the overall satisfaction levels of the student community in the country that has proved with hypothesis 4. The introduced mode of the KT process during the current situation has forced the learning community to stay at home with safety and led to maintain social distancing automatically reduced the coronavirus effect on the learning community. The learning community of the UAE has selected in-class and online/blended mode of the KT in regular and Covid-19 situations, respectively. The same has been proved in hypothesis 5. Both students and instructors of higher learning institutions in the UAE have identified issues and challenges to be addressed, improved, modified, and changed based on the hectic online and blended mode of knowledge transfer, which significantly impacts the satisfaction of the learning community. Table III stated that hypotheses 6 and 7 proved the same with appropriate values. In conclusion, about 92 percent of students and instructors' outrightly reacted with a positive frame of mind and articulated their satisfaction towards the knowledge transfer method (s) introduced by the higher education institutions (HEIs) in the UAE both in regular and the current Covid-19 situations.

V. Practical Implications

The research results are valuable for Emirati and foreign higher education institutions, which are functioning in the UAE clearly understanding the knowledge transfer modes, elements, and challenges identified through this research to promote their academic programs in their respective markets during and after the Covid-19 pandemic. More or less, similar kind of spread in the entire middle-east region for which the research outcomes also beneficial. The web-based knowledge transfer tool companies like Blackboard, Canvas, Moodle, and others have an opportunity to identify their market spread and reassess their marketing plans, programs, policies, strategies, and budgets to penetrate the entire UAE with their aggressive, and modified marketing strategies.

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