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Comparative Study on Educational Technology Curriculum for Master Degree

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ABSTRACT

Educational technology has become a branch of science that is growing rapidly in recent times. The need for a disruptive learning model due to information technology rapid development is one of the triggers for increasing enthusiasts on this field of study. Master's education in the field of educational technology is one of the programs that invite a good number of scholars to excel their knowledge and capabilities. Every university in a country has its own focus of study in this field. This article attempts to describe the results of an analysis of a number of the world's leading campuses on five continents that hold master's programs in the field of educational technology. The text analysis method is used to study the tendency of the pressure exerted on the field of study in question. The results of this study can be used for those who wish to continue their studies or conduct research in accordance with the focus of their studies.

Keywords: Covid-19, framework, learning, teaching

Introduction

Educational technology is developing so rapidly. One of the causes of its accelerated development is advances in information and communication technology. The industrial revolution 4.0 shows how technologies such as augmented reality, virtual reality, big data, internet of things, and artificial intelligence color the modern education model (Baslandze, n.d.; Deloitte, 2018). The pandemic conditions that have occurred recently have increasingly popularized the science of educational technology, especially those related to distance

education approaches. History shows how the science of educational technology developed from time to time. Educational technology which is based on instructional design is defined by AECT (The Association for Educational Communications and Technology) as "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" (AECT, 2004). Meanwhile, the Encyclopedia of Educational Technology formulates it as "Educational technology is a systematic, iterative process for designing instruction or training used to improve performance" (Januszewski & Molenda, 2001; Luppicini, 2005). Michael Spector firmly and clearly argues that educational technology is "the disciplined application of knowledge for the purpose of improving learning, instruction and/or performance (Editors, n.d.; Natividad et al., 2018; Savelyeva, 2015). A number of these definitions show the wide spectrum of the scope of educational technology studies.

Besides that, it can also be seen that educational technology is not in a vacuum, but is part of the broader educational ecosystem (Luppicini, 2005). Every university in the world has its own uniqueness and focus in the field of educational technology. This focus is the basis for curriculum development in each university (Jenkinson, 2009). This study aims to study the trends in the focus of studies on campuses on five continents in the field of educational technology. It is hoped that this investigation will provide a number of benefits. First, prospective students who wish to continue their studies at the master's level can choose the right college according to their study interests. Second, all scientists who want to carry out research easily can seek colleges of study. Third, complementary cooperation between universities can be created well. In addition, the intended focus map will assist various institutions in developing new programs that have never been held before.

Research Method

This research was conducted by studying the master program curriculum at a number of universities. A number of content that describes the profile of the master program in the field of educational technology is collected for review using a text analysis approach (Banks et al., 2018; Humphreys & Wang, 2018; Raj Arokiasamy et al., 2016). The results of content mapping in the form of text crowd (Adams, 2015) will show a picture of the trend of focus of study programs in each continent.

Picture 1: Sample of Educational Technology Program in Five Continenents

This study used 120 universities around the world with the following details:

- Fifty universities in the United States in 2018-2019 that hold master's programs in educational technology;
- Fifty universities in the United States in 2018-2019 that provide master programs in educational technology in virtual (distance education);
- Seven campuses in Europe that provide master programs in educational technology;
- Ten campuses in Asia that provide master programs in educational technology; and
- Three campuses in Africa that provide master programs in educational technology.

Sampling was taken randomly based on the availability of complete and detailed secondary data. Data availability is very important because the study was conducted using text analysis methods (Tessem et al., 2015; Welbers et al., 2017).

The following are a number of tables containing a list of the names of universities that were used as sampling in this study. Table 1 lists colleges in the United States that provide on-campus master programs. Meanwhile, Table 2 contains tertiary institutions that hold master programs by distance education. Table 3 shows a list of universities in four continents apart from the United States.

Table 1: The Educational Technology Master's Degree Program in United States

1.Florida State University	11.Drexel University	21.Concordia University Chicago	31.Waynesburg University	41.Virginia Commonwealth University
2.Ohio State University	12.Virginia Polytechnic Institute and State University	22.Concordia University Saint Paul	32.Texas State University	42.University of North Carolina Wilmington
3.Arizona State University	13.Iowa State University	23.SUNY Buffalo State College	33.University of Northern Iowa	43.University of Central Missouri
4.Auburn University	14.Kansas State University	24.University of Houston	34.University of Massachusetts-Amherst	44.Eastern Michigan University
5.Indiana University Bloomington	15.SUNY at Albany	25.University of Da	35.New York Institue of Technology	45.Western Kentucky University
6.University of Georgia	16.Ball State University	26.University of South Carolina Columbia	36.Webster University	46.University of North Carolina at Greensboro
7.Teacher College Columbia University	17.St.Cloud State University	27.University of Oklahoma	37.East Tennessee State University	47.University of Minnesota Twin Cities
8.Minnesota State University	18.Emporia State University	28.The University of Tennessee Knoxville	38.SUNY College at Potsdam	48.University of North Dakota
9.University of Florida	19.Appalachian State University	29.Concordia University Wisconsin	39.University of Cincinnati	49.University of Central Arkansas
10.Boise State University	20.Robert Morris University Illinois	30.Kent State University	40.Valdosta State University	50.Westerm Michigan University

Table 2: The Online Educational Technology Master's Degree Program 2018

1.University of Florida	11.Florida State University	21.University of Connecticut	31.University of Arkansas	41.University of North Carolina Wilmington
2.John Hopkins University	12.Brandeis University	22.University at Buffalo	32.University of South Carolina Columbia	42.California State University San Bernardino

3.North Carolina State University at Raleigh	13.California State University Fullerton	23.The University of West Florida	33.University of Oklahoma Norman	43.University of Hawaii at Manoa
4.University of Virginia	14.Michigan State University	24.SUNY at Albany	34.Virginia Polytechnic Institute and State University	44.Concordia University Chicago
5.University of Georgia	15.East Carolina University	25.University of Northern Iowa	35.Azusa Pacific University	45.Antioch University New England
6.University of Central Florida	16.California State University Long Beach	26.The University of Texas Rio Grande Valley	36.Ohio State University	46.Texas A&M University Commerce
7.Texas A&M University College Station	17.Webster University	27.Indiana University Bloomington	37.University of Alabama at Birmingham	47.Mississippi State University
8.University of Houston Clear Lake	18.Pepperdine University	28. University of North Carolina at Charlotte	38Saint Joseph's University	48.Concordia University Saint Paul
9.University of Illinois at Urbana Champaign	19.Appalachian State University	29.Liberty University	39.Oklahoma State University	49.Iowa State University
10.George Washington University	20.Brandman University	30.Texas Tech University	40.University of Dayton	50.University of North Texas

Table 3: The Educational Technology Master's Degree Program in Other Continenents

1.University of Oulu (Finland)	5.University of Geneva, Switzerland	9.Hanyang University (South Korea)	13.University Sains (Malaysia)	17.University of Wollongong (Australia)
2.Far Eastern Federal University (Russia)	6.Center for Research and Interdisciplinary (France)	10.The University of Tokyo (Japan)	14.Central China Normal University (China)	18.University of Cape Town (Africa)
3.University of the Laguna (Spain)	7.Northern Arctic Federal University (Russia)	11.National Institute of Education (Singapore)	15.NIIT University (India)	19.University of Witwaterstrand (Africa)
4.Viseu School of Education (Portugal)	8.EWHA Womans University (South Korea)	12.Open University (Malaysia)	16. Jakarta State University (Indonesia)	20.University of Nairobi (Africa)

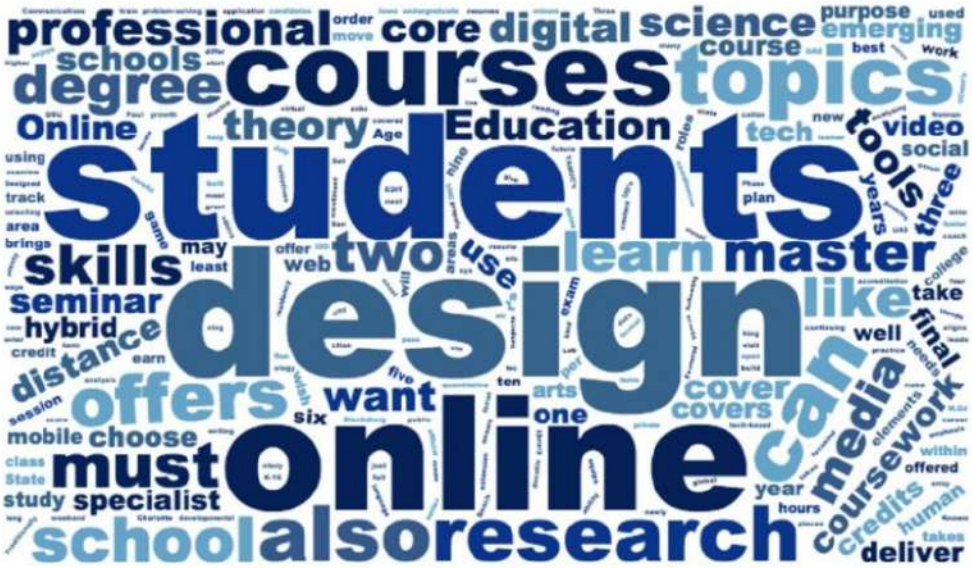
The data used as a source of knowledge in study studies comes from a number of secondary documents that can be obtained from a number of sources. The first document is a university profile, in which it briefly describes the objectives of the study program, the focus of the learning process, and the degree awarded. Meanwhile, the next document is a curriculum in which there is a list of courses taught for each learning period. A number of other documents that are used as additional content and other information are related to: collective campus research focus, laboratory facilities, student profiles, products produced by universities, and services offered to the surrounding community.

Results and Discussion

The first study was carried out on the 50 best universities in the United States that organize master programs in educational technology. Analysis of the text crowd mosaic shows that the pressure of educational technology studies focused on elements of design and development (design and development). The design and development referred to here is related to instructional design or techniques and the art of planning the learning process. Furthermore, it can also be seen how the design process involves the concept of multimedia in it by utilizing online media. The next thing that is interesting to see is how this program also involves research activities in it. Meanwhile, other content that is also studied as periphery relates to basic theory, evaluation process, communication strategy, performance measurement, and educator competence. The emphasis on planning and developing the learning process is understandable given the large number of theories and concepts in this field introduced by scientists from the United States (Alamin et al., 2015; Bond et al., 2020). The presence of online and multimedia concepts also illustrates how universities there have started to develop research on e-learning, which is a development of the concept of distance learning.

Picture 2: Text Crowd of the Educational Technology Program in United States

Subsequent studies were carried out on 50 tertiary institutions that held virtual educational technology programs in the United States. It can be seen that the focus of study on these campuses lies in designing online courses that focus on students. Because it focuses on the use of information and communication technology, the content that is studied next in the study program includes: digital science, learning theory, distance education, and multimedia. The emphasis of the study on the student component, courses, design, and online shows how the concept of student center learning becomes the focus of the online learning model (Khan, 2007; Sharpe et al., 2006).



Picture 3: Text Crowd of the Online Educational Technology Program in United States

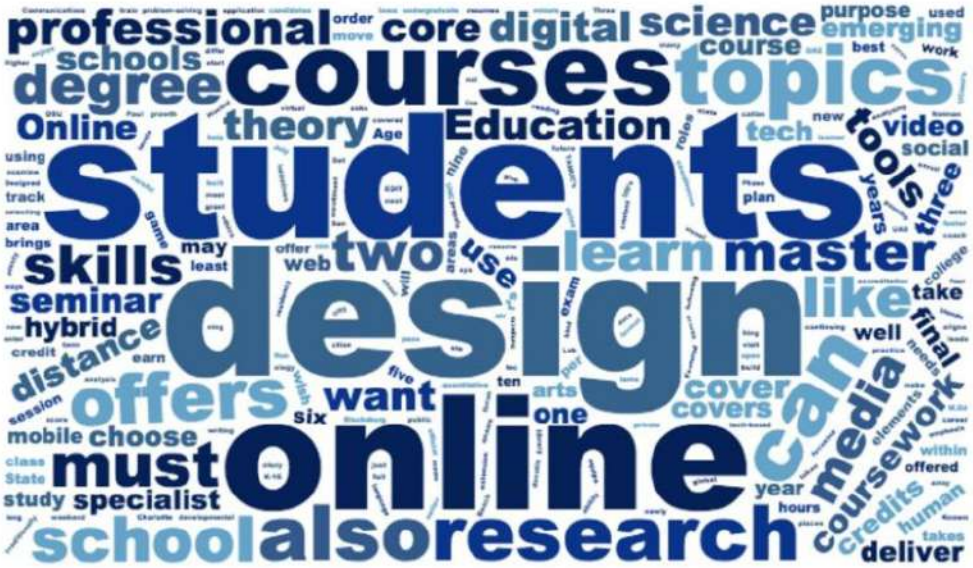
An interesting analysis was generated when trying to study educational technology programs in continental Europe. Mozaik text crowd shows how education based on information and communication technology (ICT = Information and Communication Technologies) has become the center of study for most universities. In addition to the use of technology to facilitate the learning process, there are also a number of interesting keywords to observe, such

as: knowledge, training, expertise, innovation, digital, and projects/programs. There are also the words design and development as in conventional programs, it's just that in this context what it means is designing and developing learning models based on information and communication technology (Ipek & Ziatdinov, 2017; Wasson & Kirschner, 2020).

Picture 4: Text Crowd of the Best Online Educational Technology Program in Europe

Further analysis was carried out on campuses in Asia and Australia. An interesting phenomenon can be seen here where the focus of the study emphasizes the aspects of learning or "learning" in education or "education". This means that learning is emphasized on learning strategies and principles that must be applied in an educational environment. Other keywords such as policy, academic, program, management, school, and learning show that study programs in the Asia-Australia region are for those who want to design curriculum and learning models in formal education units, especially schools (Hedberg & McNamara, 2002; Krishna,

2019; Tsai & Hwang, 2013). The emphasis on the concept of learning shows how campuses in Asia and Australia try to further explore this phenomenon, due to the diversity of populations that exist in one country.



Picture 5: Text Crowd of the Best Online Educational Technology Program in Asia-Australia

Meanwhile, other results can be seen when studying study programs on campuses on the African continent. A cursory analysis of the text crowd mosaic shows that there is no single focus on a particular subject, but rather a balanced or even portfolio of content studies. The topics that are studied are balanced in relation to aspects around: technology, education, programs, learning, knowledge, integration, research, expertise, and teaching materials. Other things that are also minorly studied in the study program are related to pedagogy, psychology, sociology, and so on. This is interesting to observe because it will bring a new understanding of the scope of educational technology in the modern era. The meaning of educational technology tends to expand with the various phenomena of progress in the field of information and communication technology. Another reason could also be due to the condition of the African continent which is relatively left behind with other continents so that all components

that make up the educational technology ecosystem are important factors that must be considered carefully ("Educational Unsustainability in Sub-Saharan Africa: In Search of Counter-Narratives to Policy Pressures and Exponential Tech Growth," 2019; Hart & Laher, 2015).

Picture 6: Text Crowd of the Best Online Educational Technology Program in Africa

Research shows that each continent has its own study trends. Based on the results of the text analysis, a mapping process was carried out to compare the situation between continents. The following table shows the different focus of the study among the countries in question. The letter H (High) is used to show the main focus of the curriculum and topics of discussion in the study of educational technology on a continent. Meanwhile the letters M (Medium) and L (Low) follow it as a discussion with a lower intensity.

Table 4: Perbandingan Fokus Studi Perguruan Tinggi antar Benua

	Amerika (offline)	Amerika (online)	Eropa	Asia-Australia	Afrika
Education	L	L	H	H	H
Instructional	L	L	M	H	H
Design	H	H	H	H	L
Development	H	L	L	L	M
Research	H	H	L	H	L
Training	L	L	H	L	H
Program/Project	L	L	L	L	H
Technology	H	H	H	H	H
Multimedia	H	M	L	L	L
Pedagogy	H	H	L	H	M
Sociology	L	L	L	M	M
Psychology	L	L	L	M	M
Policy	L	L	L	L	L
Curriculum	M	L	L	L	L
Management	L	L	L	M	M
Course	L	H	L	L	L
Educator	H	L	M	L	L
Student	L	H	L	L	L
Materials	L	M	L	L	L
Innovation	L	L	H	L	L
Performance	M	L	L	L	L
Evaluation	M	L	L	L	L
School	M	L	L	M	L
Class	M	L	L	M	L

Conclusion

The results show that as a science, educational technology has a number of important components that become the focus of its studies. Each country has its own uniqueness and specificity in carrying out its master program. The on-campus program in the United States focuses more on the concept of designing and developing the learning process, while the online program emphasizes the implementation of student-centered learning based on distance learning. Meanwhile, on the continent of Europe the focus shifts to how the use of information and communication technology in carrying out a modern education model. Another case in the Asia-Australia continent, which focuses on the meaning of the learning process in the various life of the community, especially schools and other educational units. As for the African continent, it seems that it does not have one priority focus because all components in the educational technology ecosystem have a similar level of importance. Thus, scientists or

researchers who wish to conduct an in-depth study of the aspects of educational technology can choose the right country according to the focus of their study.

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