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# Mapping the Current Capacities of Higher Educational Institutions and the Labour Market Needs of the Financial Services Industry in the Philippines

Project Number: 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

## A National Benchmarking Report

November 2020



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## Table of Contents

Abstract	iii
List of Figures	iv
List of Tables	v
I] Introduction	1
1. The TRUST project	2
2. The Philippines Fintech at a Glance	3
3. Overview of the Higher Educational Institutions in the Philippines	5
4. Gaps and Growth Areas	7
II] The Methodology	7
1. Data Collection from Fintech Industry	9
2. Data Collection from HEIs	9
III] Results and Discussion	10
1. The FinTech Industry Labour Needs	10
a. The Participating Companies and Profile	10
b. The Challenges of the Fintech and Related companies	13
c. Data Assessment by Fintech Association of the Philippines	14
2. The Current Competencies of HEIs to Supply Talents to Fintech Industry in the Philippines-	17
a. The Pedagogical Needs and Challenges	24
3. The Secondary Data Assessment	27
4. The Pedagogy of Master in Fintech and Digital Innovation	28
a. Program Educational Objectives	28
b. Program Outcomes	28
c. Potential Positions/Designation in Various Companies	28
5. The Minimum Academic Requirements	29
IV] Summary, Conclusion and Proposal	32
VII] Appendices	34
A. Interview Questions Guide for Industry	
B. Questionnaire for Higher Educational Institutions	



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## ABSTRACT

This Work Package 1 (WP1) Report of the TRUST project elaborates the results of the mapping of the current capacities of the higher educational institutions (HEIs) and the labour market needs of the financial services industry in the Philippines. TRUST is an acronym for “Financial Technology and Digital Innovation to Modernise and Develop Curricula of Vietnamese and Philippines Universities. This is a consortium of three European HEIs and one enterprise, three Vietnamese HEIs, three HEIs and one fintech organization from the Philippines. TRUST is project that is co-funded by the European Union Erasmus Plus Programme with project number 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP. This scoping study aimed at assessing the professors and the universities’ staff training needs on fintech and digital innovation, as well as the fintech market labour needs in the country. Employing both the descriptive and qualitative research design, utilizing two types of survey instruments and online google survey platform, the Philippine team was able to analyse data from 24 fintech and related companies and 73 respondents from 50 HEIs. Results showed hard core fintech companies need Talents who are adaptable to technology with financial background, and prefer Talents with experiences than having the degree. In addition, record showed that the Philippines HEIs needs retooling of their faculty members and restructuring of some academic programs. Details are further elaborated in Section III of this WP1 Report.



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## List of Tables

No	Description	Page No
1	Names and Location of Higher Educational Institutions Participated in the Survey	17
2	Average General Profile of the HEI Respondents	21
3	The Level of Motivations of Various HEIs to Offer the Master in Fintech and Digital Innovation	21
4	HEI's Capability on Technology Preparedness and Student Support Aspects	24
5	The Teaching Approach Modality	25
6	The Identified Courses and the Preparedness of the Current Faculty Members	26
7	Mapping of Courses and its Clusters	30



## List of Figures

No	Description	Page No
1	The Republic of the Philippines composed of three major groups (Luzon-Northern Philippines, Visayas – Central Philippines and Mindanao – Southern Philippines)	1
2	The growing fintech industry in the Philippines	4
3	Types and distribution of HEIs (including SUC's Satellite Campuses) in the Philippines	5
4	Enrollees by discipline during the academic calendar 2019-2020	6
5	Conceptual framework for the mapping of HEI current competency and the fintech industry training needs	8
6	Types of fintech related industry respondent	11
7	The industry respondents and their number of employees	12
8	Personnel profile of respondents from the Philippines	13
9	The Fintech Philippines Association Members	15
10	Partner HEIs contribution with respect to the number of respondents	19
11	The category and number of respondents from HEIs	20
12	Highest educational attainment of respondents	20



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Project Number: 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

13	Response of HEIs on the motivation to offer MFDI	22
14	Factors considered by the prospective students to enroll in MFDI program	23
15	Preferences for the mode of delivery for MFDI	25
16	Preparedness of faculty members to teach technical courses for MFDI	32



## I. Introduction

The Republic of the Philippines (Figure 1) composed of 7,641 islands, the 2,000 of which are inhabited, are called home to about 110 Million Filipinos<sup>1</sup>. Due to the geographical nature of the country and the current COVID-19 pandemic situation, people are striving, and trying to cope with the shift of socio-economic and technological demands, and keep abreast with the neighboring countries in terms of financial technology trends. In this fast changing world, knowledge in fintech and digital innovation becomes a necessity.



Figure 1. The Republic of the Philippines composed of three major groups (Luzon-Northern Philippines, Visayas-Central Philippines and Mindanao-Southern Philippines)<sup>2</sup>

Fintech means a combination of finance and technology. It describes new technology with the objective of enhancing, securing, and automating the delivery of financial services. The Fintech industry is a fast growing market outgrowing the current market talents. Hence, a consortium was formed in January 2020 involving three European Higher Educational

<sup>1</sup> Worldometer, (2020). Philippines Population in 2020. Available at <https://www.worldometers.info/world-population/philippines-population/> on October 31, 2020

<sup>2</sup> Touropia, (2020). Eight Most Beautiful Regions in the Philippines. Available at <https://www.touropia.com/regions-in-the-philippines-map/> on October 27, 2020.



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Institutions (HEIs), one European enterprise, three HEIs from Vietnam, three HEIs and one Fintech organization from the Philippines. This consortium was created with project number 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP titled “Financial Technology and Digital Innovation to Modernise and Develop Curricula of Vietnamese and Philippines Universities (TRUST) co-funded by the European Erasmus Plus (EU E+) Programme. This is under the Call for Proposals 2019 – EAC/AO3/2018 Key Action 2 – Cooperation for Innovation and the Exchange of Good Practices – Capacity Building in the Field of Higher Education (CBHE). This initiative is expected to develop new masters program consist of *innovative pedagogy and hands-on experience* to better prepare graduates in a fast evolving industry that requires competence in finance, business management equipped with tools of new technology for faster service with accuracy, and apply a new mode of thinking<sup>3</sup>. The TRUST project is composed of seven (7) work packages; however, this report focuses on Work Package 1 (WP1) only. The WP1 is the mapping of current capacities of the HEIs, and the labour market needs of the financial services industry in the Philippines and Vietnam. This document elaborates the relevant scenarios in the Philippines.

Financial education is a paramount challenge in the Philippines. Based on the rating of Standard and Poor’s (S&P), there were only 25% of Filipinos who were financially literate and less than 1% who has knowledge in investing. This situation posed threats to the living standards of Filipino families. Based on the initial information of Fintech Philippines Association, the Fintech industry needs are as follows: *improved digital infrastructure, finding the right technology talent, and improved foundational education in mathematics/engineering*. Hence, according to the Commission on Higher Education (CHED), collaboration between industries and higher education stakeholders will strengthen an education sandbox infrastructure, a working directory or a test server. Having written the above, it is seen that master program with financial technology will strengthen the financial competency/literacy among Filipinos. With the integration of digital innovation such as business analytics in the program would facilitate a more efficient way in solving analytical problems in the financial sector. HEIs would be better prepared to produce Talents who could provide the required services of Fintech industry.

### 1.1 The TRUST Project

The TRUST Project represents a curriculum development initiative that is geared towards developing a new Master’s degree programme in information technology (IT)-related finance alongside the refinements of existing Master in Business Administration (MBA). It aims to improve the quality of the higher education in Vietnam and Philippines in financial technology and digital innovation to answer to the emergent workforce need of the financial services industry. The specific objectives are to: (1) design and develop a master academic program in financial technology and digital innovation in Vietnam and Philippines; (2) modernize relevant existing masters academic program in business and economics with specific contents on financial technology. This academic program was envisioned to prepare

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<sup>3</sup> McCarthy Earls E., (2019). Preparing Students for a Future in Fintech: The Role of Massachusetts Public Universities. Pioneer Institute, Public Policy Research, White Paper No. 194, march 2019.





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students in the financial services that require complicated use of technology. It targets to have graduates who would be active in participating to online banking platforms, investments and business. In addition, the master program would produce graduates who are encourage to create business start-ups using technological innovations that allow them to reach through broader market, and can cope with the rapid development of financial technology. Furthermore, the master/s program shall enable graduates to remain competitive in the information technology career and in the business.

The main target output of TRUST project in the Philippines is the offering of Master in Financial Technology and Digital Innovation (MFTDI) started in three partner universities; i.e., Mapua University, Saint Louis University, and University of Cebu by 2022. The curriculum of MFTDI is expected to be delivered in blended modality to include both workshops and distance learning to at least 120 students. Apart from the target new MFTDI program, it is expected that the three HEI partners would improve its existing relevant or related academic programs by updating its modules and include both workshops and online learning in its contents. Hence, scoping study was carried out to contribute vital information for institutional planning for the development of the MFTDI program. The result of the scoping study will help the Philippines figure out on what courses shall be included, tools to be used, and modality of delivery to produce academic program that has the capability and competency in providing human resources who are technologically competent to support financial services industry.

## *1.2 The Philippines Fintech at a Glance*

The Philippines through its “Build, Build, Build” program has increased infrastructure spending forcing to surge foreign investment in digital transformation. The Bangko Sentral ng Pilipinas (BSP – the Central Bank of the Philippines) pursues three (3) strategic thrusts to harness digital technology for greater financial inclusion in the country<sup>4</sup>. These three strategies are (a) building an inclusive digital finance ecosystem, (b) creating compelling use of cases for financial inclusion, and (c) fostering financial literacy and trust in the financial system through consumer protection. Among the 110 million Filipinos as potential Fintech user, 47% were coming from urban areas, 29% share of adults with a bank account, 12 finance access points per 10,000 adults, 2.0 ATMs per 10,000 adult, 67% internet penetration, 65% smartphone penetration, 150% mobile subscription, 54% internet users using mobile banking, 1.2 branches per 10,000 adults, 2% credit card ownership, 335 share of adults with outstanding loans, and 9% share of MSME (micro, small and medium enterprises) loan to total business loan<sup>5</sup>. In addition and in the Global Fintech Index, Manila was ranked 66 out of 238 cities, and Philippines ranked 46 out of 65 countries<sup>6</sup>. This scenario illustrates a big fintech market potential in the Philippines. Further, the Philippines is a regional hotspot for Fintech in payments, alternative lending, digital banking, and supporting enterprises. There are over 100

<sup>4</sup> Konig, C., (2020). *The Philippines Fintech Report 2020*. Fintech News Network, Fintech Alliance. PH.

<sup>5</sup> Philippine Statistics Authority, (2020). *We are Social 2020 Digital Report*, Global Findex World Bank, Bangko Sentral ng Pilipinas.

<sup>6</sup> The Global Fintech Index (2019): *The Global Fintech Index City Ranking Report*, Findexable Limited ([www.findexable.com](http://www.findexable.com)), December 2019.



Fintech companies in Manila ranging from payment start-ups, blockchain players and established banks launching their own neobank platforms. Currently, there are about 197 Fintech companies in the Philippines with 14 categories such as Lending (24%), Payments (21%), Wallets (12%), Remittance (12%), Blockchain/Crypto (8%), Crowdfunding (4%), Comparison (4%), Neobanks (3%), E-commerce (3%), Credit Scoring (3%), Marketplace/Investment (3%), Insurtech (2%), KYC/Security/RegTech (2%), and AI/Big Data (0.5%) [3]. According to the Founder of Fintech News Network, Christian König, that Manila was named in 2019 as one of the friendliest cities in the world for FinTech startups. Hence, the industry is expected to increase by 84% in 2022 from its 2018 record. This is further forecasted to increase beyond double from its 2018 record due to the COVID-19 pandemic by which people were forced to use digital platforms during lockdown. The Asia-Pacific FinTech market is expected to have an average annual growth rate of 72.5% for the period of 2019-2025<sup>7</sup> just before the declaration of pandemic. The market segmentations by service are: payments, personal finance, loans, insurance, fund transfer, wealth management, and among others. The segmentations by application are: banking, insurance, trading, taxation, and related others. Figure 2 (below) shows the growing fintech industry in the Philippines especially in the areas of mobile banking, credit cards and ATMs (automated teller machines), internet and smartphone penetration which are few of the Launchpad in which consumer-based fintech can grow.

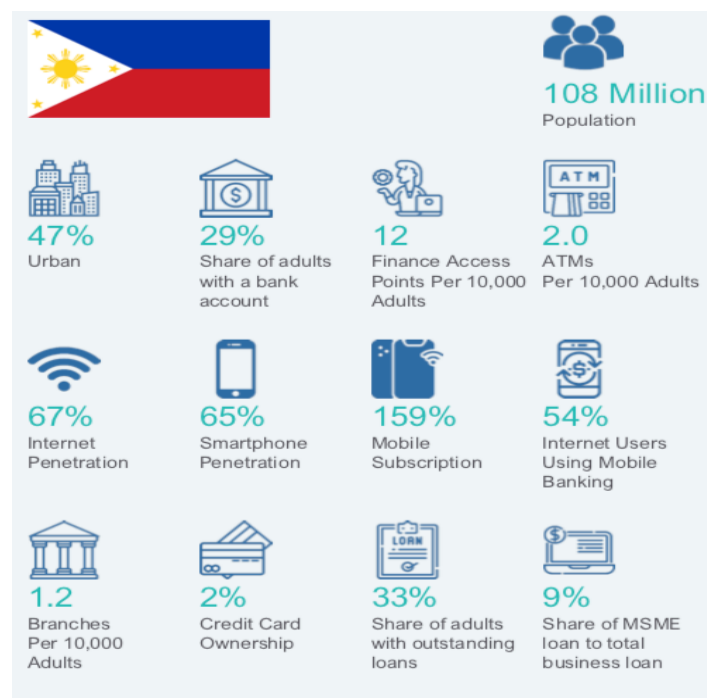


Figure 2. The growing fintech industry in the Philippines<sup>4</sup>

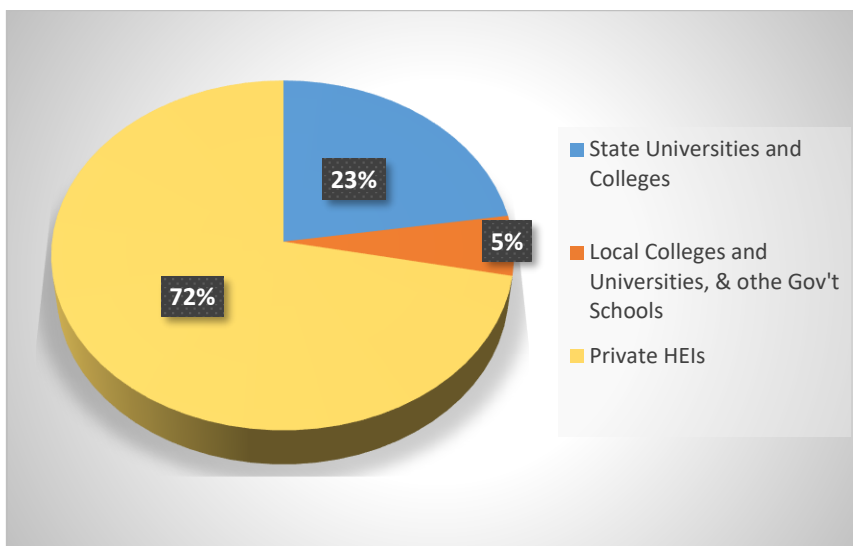
<sup>7</sup> APAC, (2020). APAC Fintech Market Size & Growth (2020-2025). Market Data Forecast. Available at <https://www.marketdataforecast.com/market-reports/apac-fintech-market> on 18 October 2020.



Another promising area in fintech is business loan to MSME as mentioned above. Loan out to this sector is a tiny fraction compared to the overall loan part of the reasons is the financial system formalities in terms of access to finance which financial technology can offer a good alternative in terms of lending practices. In terms of payment transactions by value ATM remains as the main payment platform with 72%, another big potential for fintech considering that eventually portion of this market will detach itself from this traditional payment platforms available, ATMs included. Another few avenues that have big potential include Insurtech, Blockchain and Cryptocurrencies which will eventually gain the confidence and acceptance by the mainstream market in few years. Hence, the Philippines is expected to keep abreast with its neighboring countries in terms of fintech and digital innovation.

### *1.3 Overview of the Higher Educational Institutions in the Philippines*

The Philippines with about 110 Million people, has 541 state universities and colleges (SUCs), 132 local colleges and other government schools (LCUs), and 1,721 private higher educational institutions (PHEIs) as of August 08, 2019<sup>8</sup>. A total of 2,392 HEIs in the Philippines including SUCs satellite campuses. Seventy two percent (72%) of the total HEIs in the Philippines are private institutions. These Philippine HEIs are composed of stock and non-stock capital type of institution. Figure 3 clearly describes the Philippines HEIs scenario that is dominated by privately owned HEIs.



**Figure 3.** Types and distribution of HEIs (including SUCs Satellite Campuses) in the Philippines

<sup>8</sup> Commission on Higher Education, 2019. Distribution of Higher Educational Institutions by Institution Type: AY 2018-2019. Available at <https://ched.gov.ph/distribution-of-higher-education-institutions-by-institution-type-ay-2018-19/> on October 25, 2020.



Currently in the Philippines HEIs are abiding by the latest Memorandum Orders issued in 2017 by the country's regulatory agency, the Commission on Higher Education (CHED). One of the specializations being recognized in these CHED orders is Business Administration major in Financial Management the only specialization related to finance and banking outside specializations in Accountancy education. Engineering and Tech as well as Information Technology education are covered by another memorandum orders with listed courses that are understandably focused on core competencies in their respective disciplines. At present, there is no specific memorandum order to offer financial technology program for HEIs in the Philippines

In academic year 2019-2020, higher education enrollees in the Philippines totaled 3,408,425 of that figure 48.79% are in Business, IT, Engineering and Tech (Figure 4). Specifically, 878,661 (25.77%) are enrolled in Business Administration and related fields, 324,696 (10.05 %) are enrolled in IT-related disciplines, while Engineering and Tech has 442,064 (12.97%). With the current shortage of high-value skills in the areas of Engineering, Information Technology, Business and other related field, there are two apparent things that need to be addressed. First is the need on the part of the academe to re-orient and create a crosspoint offering where traditional business, IT, engineering and tech courses can max out its their common potentials. Another thing worth noting is the fact that this current scenario of talent shortage beams on the presence of a promising market gap that this hybrid course offering in fintech can fill in both from the academic as well as in the industry standpoint.

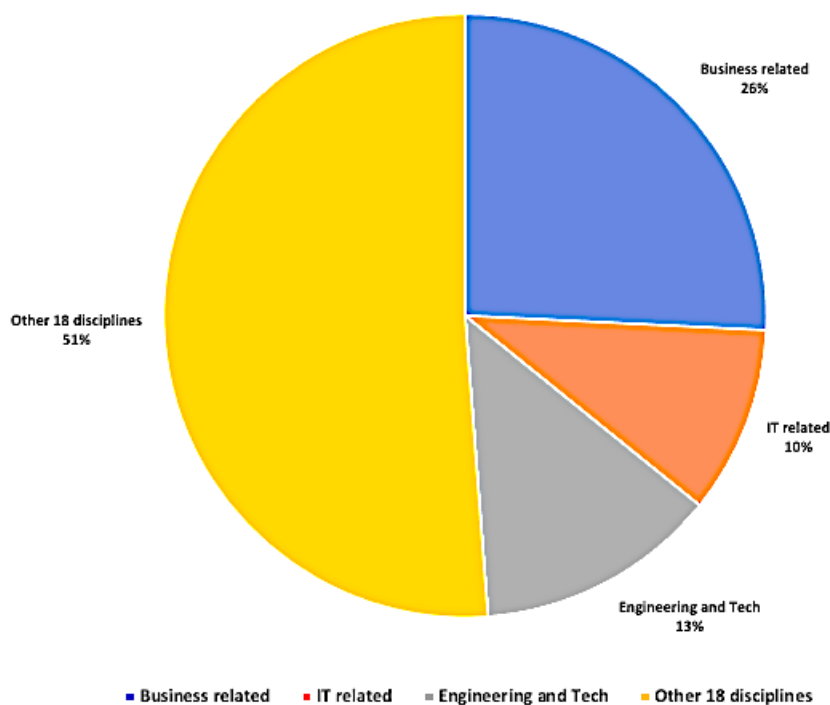


Figure 4. Enrollees by discipline during the academic calendar 2019-2020<sup>8</sup>



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The Philippines, through the Republic Act 10533 – Enhanced Education Act of 2013, has implemented its K-12 basic education program. This program accelerates mutual recognition of Filipino graduates and professionals in other countries. This provides every Filipino the education he/she needs to compete in the global community. Hence, the CHED aims at giving Filipino students the skills, concepts and deep knowledge to compete in the global arena.

#### *1.4 Gaps and Growth Areas*

One of the most recent and noticeable developments in business transactions is the acceptance and confidence by consumer in online and mobile banking, electronic payments, money transfers and electronic settlements. The good technological indications are the exploration of institutions and startups on other areas such as Blockchain technology, artificial intelligence, cryptocurrencies and other advanced technologies in the financial services sector. These movements in the financial sector demand a new generation of workforce with new set of skills. Hence, HEIs shall act fast to produce human capital and support the labour needs of the rapid growth of fintech industry. Fintech education could be a good precursor to a more technologically laden business atmosphere that liberates market participants from going through the rigorous formal financial market system. At the grassroots level, Fintech, in substance, promotes inclusiveness considering the fact that 99% of all businesses in the Philippines are composed of MSMEs. Many of these businesses are into the formal financial sector however 71% (51.2 million) of Filipino adults do not have bank accounts. This 51.2 million are consumers who would easily prefer convenience over financial formalities in their daily transactions. Advancement and access to financial technology by this market speeds up transactions, increases business volume and output averages which in turn improve business conditions and will eventually redound to the benefit of the overall economy.

## II. Methodology

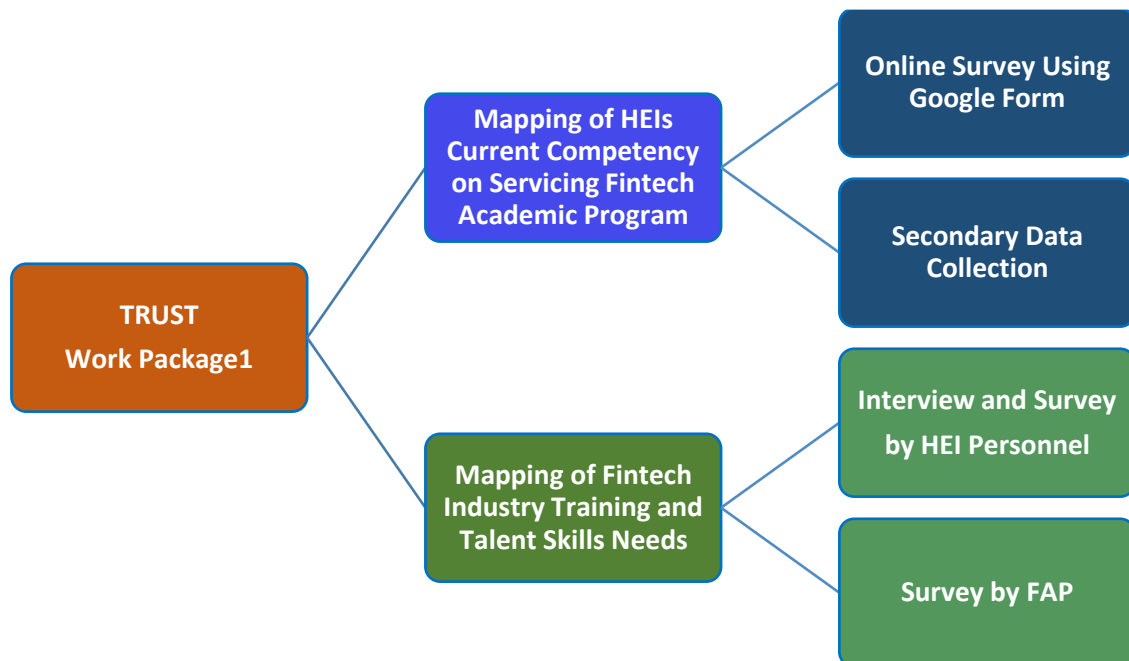
The scoping study was conducted in the Philippines which aimed to assess professors and the universities' staff training needs on fintech and digital innovation. This was carried out by Mapua University (Manila), Saint Louis University (Baguio), University of Cebu (Cebu), and the Fintech Association of the Philippines - FAP (Makati). The study utilized the descriptive, and qualitative research design. The descriptive method describes the characteristics of the population being studied. This methodology focuses more on the 'what' of the research subject than the 'why'. It describes the nature of a demographic segment, without focusing on 'why' a particular phenomenon occurs.

On the other hand, qualitative research involves collecting and analyzing non-numerical data to understand concepts, opinions, or experiences. It was used to gather in-depth insights into a problem or generate new ideas for research. Two types of survey instruments were utilized in this research. One focused on the mapping of Philippine HEIs in terms its capability to deliver the courses, the choices of the respondents on the kind of teaching modality at their convenience. This is due to most master students are working. The other survey



instrument involved the FAP. Hence, two sectors were involved in the study as shown in **Figure 5**. This figure illustrates the conceptual framework of the study.

The research instruments that were employed for this research contained both close and open ended questions. The HEI survey target respondents were the senior university managers and faculty members. The other set of questions yielded quantitative data were tested and analyzed using frequency counts, percentages and one of the measures of central tendency which is median. Frequency is simply counting the number of observed values. Percentage, on the other hand, is a descriptive analysis demonstrating the comparison between sizes of the population and sample in a particular area. While median is the value which occupies the middle position when all the observations are arranged in an ascending/descending order. Median was used to treat the data since it is not affected by outliers; hence, giving more meaning to the described data. Data gathering was done during May to September 2020.



**Figure 5.** Conceptual framework for the mapping of HEI current competency and the fintech industry training needs

As mentioned above, scope of the study covers the whole country with a minimum target of 50 respondents from HEIs, and 10 interviews from Fintech industry. This is to address the minimum sample size requirement of 99% confidence level for data assessment. The scoping study included the following steps: (a) identifying relevant studies; (b) study selection; (c) data collection; (d) data curation (i.e., data tabulation, summarizing), (e) creation of figures; (f) interpretation, and (g) analysis. Some modalities were applied to gather the data.





## II.1 Data Collection from Fintech Industry

The industry data collection was administered to fintech and related companies operating in the Philippines. This was to determine the current and future manpower needs to support their current operation and future needs. Structured questions and questions guide (Annex A) were developed by all partners. The survey was conducted using the following mode: interview with permitted recording, and through email using an instrument with structures questions guide. The interview questions guide covered the following: (a) company background, (b) personnel skills at entry level; (c) personnel current competency, the challenges, and training needs, (d) technological tools and services currently used by the company, and (e) skills of talents necessary to support the near future needs of the Fintech industry. The interview guide included open-ended questions about the company background, personnel competencies and challenges, and the technological tools and services. Some enumerators conducted a one-on-one interview, then transcribed the answers on the instrument, and later asked the respondents to read through the transcription and confirm whether the inputs were properly captured. Respondents were assured that their remarks would be reported accurately, but not attributed specifically in the publication without specific permission.

The Fintech Association of the Philippines (FAP) conducted an internal survey and was able to collect data in the first quarter of 2020. These data were considered secondary data for this TRUST Work Package 1. In addition to these data, the FAP conducted reviews from related studies, i.e., within this year and immediate past couple years. Data from this mode of assessment were also considered secondary data.

## II. 2 Data Collection from HEIs

Online survey to HEIs using google forms were structured questions. The survey questions (Annex B) to HEIs were composed of the following: (a) information about the affiliation of respondent; (b) perception to the planned master financial technology academic program; (c) fintech related academic program/s currently offered by their university/college; (d) important factors for prospective students of master in financial technology and digital innovation program, (e) use of information technology, software and obstacles for the implementation of master fintech, (f) the pedagogical practices, (g) fintech related research areas, (h) potential academic courses for master in fintech, and (i) prepared and competency of lecturers/professors.

Some enumerators sent the survey instruments through email and respondents were kindly asked to fill out the survey questionnaire by providing information on behalf of their institutions. However, majority of the enumerators responded to the questionnaire using the google form. The instruments for HEIs and industry were developed by the consortium members. The three (3) HEI partners in the Philippines submitted the list of its target respondents to the International Coordinator in Italy. This is to avoid conflict and duplication of respondents. Networks and connections through Facebook, and several university group chat were also used as strategy for the survey as the scoping study was carried out during the COVID-19 pandemic period.



### III. Results and Discussion

Subsequent sections below elaborate the results of the mapping study carried out in the Philippines by Philippine TRUST four partners in the Philippines. First subsection discusses the mapping of the labour skills and training needs from the fintech industry followed the current competency and related academic program offerings of the HEIs in the Philippines. Results yielded both qualitative and quantitative data and information.

#### *III.1 The Fintech Industry Labour Needs*

Based on record, twenty four (24) FinTech and related companies, shown as [Figure 6](#) operating in the Philippines, responded to the interviews and survey. The highest respondents came from the insurance sector with 10 respondents (42%), followed by the software industry with 3 respondents (13%) and then 2 respondents (8%) each from the bank and manufacturing industries. The rest of the respondents came from analytics, ERP, leasing & financing, media, real-estate, regulatory and telecommunication. The respondents of the survey were employees of the company whose designation is in the middle to top level management. The survey was administered to companies with different number of employees ([Figure 7](#)). The questions yielded quantitative as well as qualitative data that were analyzed using frequency ranking counts, tabulated percentages and descriptive analysis of responses.

##### *III.1.a The Participating Companies and Profile*

Seven companies (29%) have less than 100 employees, 4 companies (17%) with employees between 101 to 500, 1 company (4%) with 501-1000 employees and 1 company (4%) with 1001-2000 employees. Other companies that responded to the survey have employees ranging from 2001 to more than 10,000, which are mostly from the insurance industry. The first question asked was on the growth trend of their company in the next 3 years. Nineteen (19) or 79% responded that they expect their company to have a continuous growth in the next 3 years. Fintech companies expected a 100% growth per year for the next 3 years. On the other hand, 4 or 17% responded otherwise while 4% company was not sure on what will be the growth trend of their company in the next 3 years. Another, the companies were asked if they have a dedicated research, development and innovation (RDI) office. Out of the 24 respondents, 13 (54%) responded that they have a dedicated RDI office, 7 (29%) responded that they don't have, and 4 (17%) had no idea on the existence of RDI office in their company. When respondents were asked on how much of the budget was allocated to RDI office, only 5 respondents were able to provide the percentage budget allocation to RDI office. This budget range from 5% to as high as 40% of their income. Eight respondents (33%) answered that they do not have budget for RDI while 11 companies (46%) have no idea on percentage share of their budget to RDI office. These data were associated to the research system in the Philippines that is not matured yet.

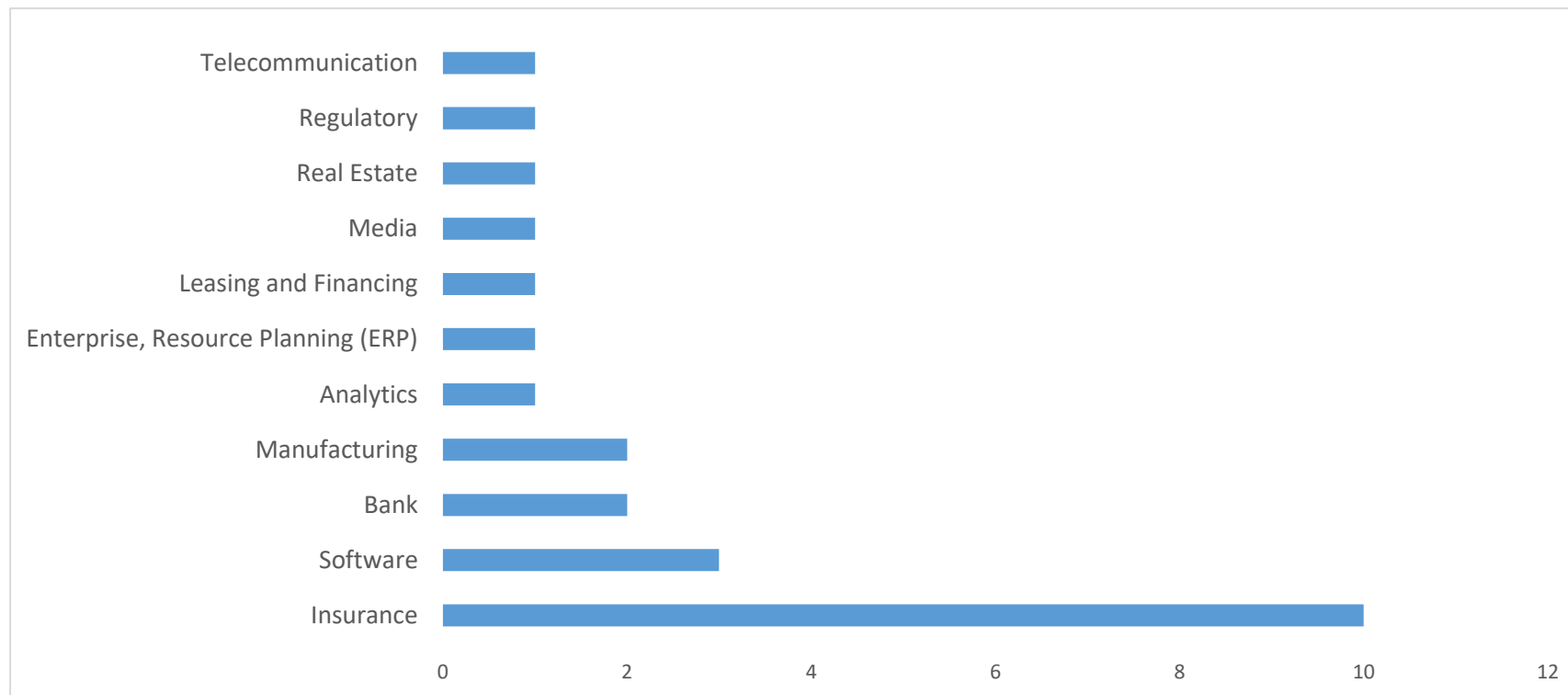




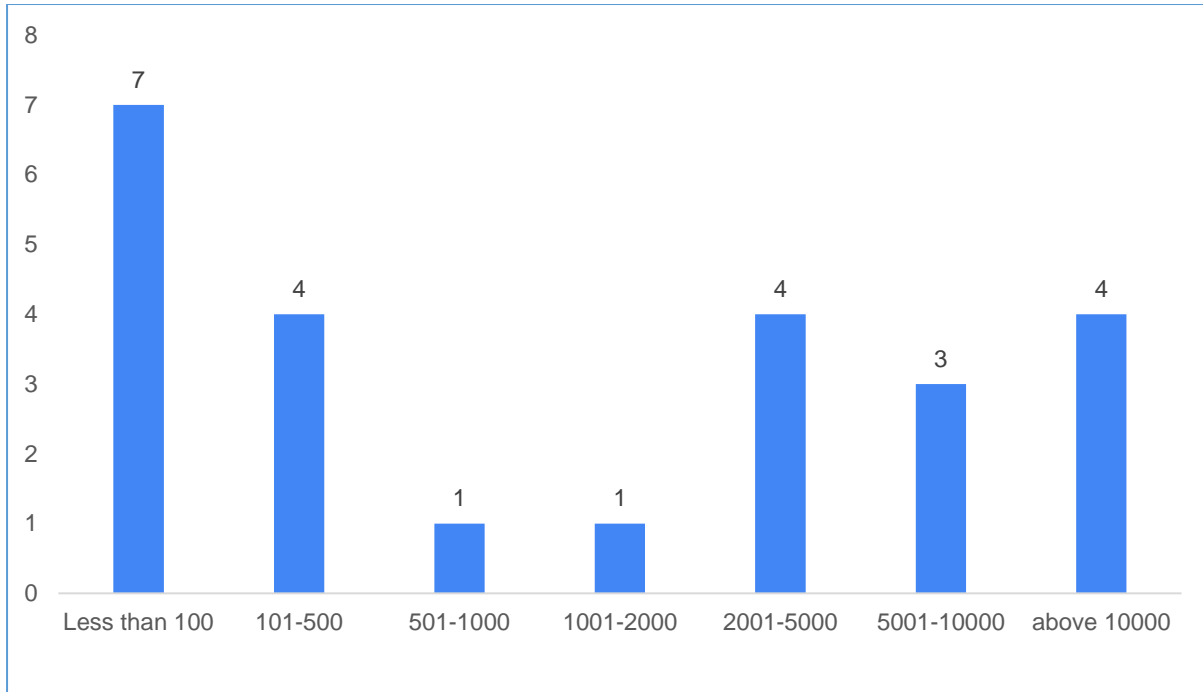
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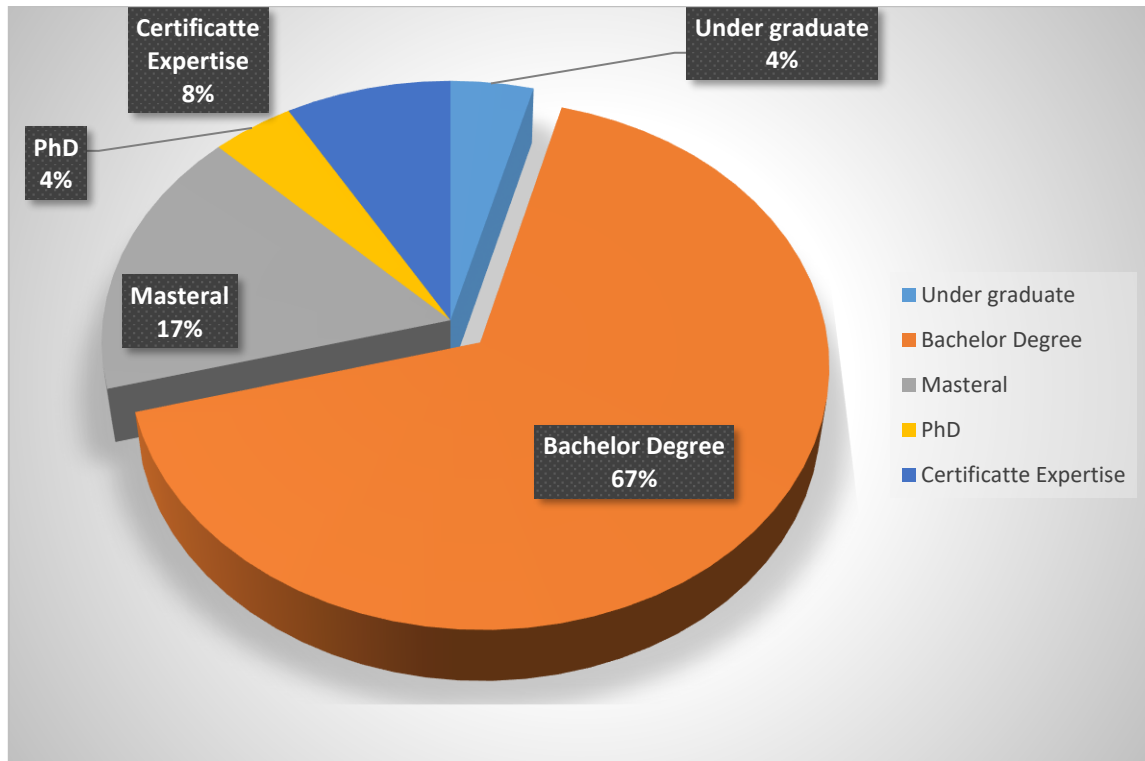


**Figure 6.** Types of fintech related industry respondents



**Figure 7.** The industry respondents and their number of employees

On the industry perception about the planned MFTDI, in which the target is to provide talents to industry who possess skills needed by the industry, information about entry level skills requirements are important. Hence, the industry was asked on the requirements for the **entry level skills of potential personnel**. Result showed that the communication skill emerged as the top skills (38%), followed by business/financial skills (24%). Other entry level skills are analytical, problem solving and selling skills which obtained similar percentage of 10%. Design thinking and information technology skills are the least priority skills with only 5% share. This result is associated to the majority type of respondents who were from insurance sector. The interview results to people who are affiliated to payment infrastructure company mentioned that they need people with (a) business and operations, and (b) product and engineering background or skills. Interview results to people whose company is a small to medium size addressing capital needs through crowdfunding mentioned that they need people who are adaptable to technology with financial background. That, the technical background they refer are management engineering, management information systems, and courses in the in the areas of programming languages, database, infrastructure, server maintenance, mobile App development, UI (user interface) and UX (user experience) design. In addition, it was recorded that majority of the personnel has Bachelor degree with few personnel with master degree. [Figure 8](#) shows the current profile of the respondents from fintech and fintech related industry personnel.



**Figure 8.** Personnel Profile of Respondents from the Philippines

### *III.1.b The Challenges of the Fintech and Related Companies*

Based on the surveys and interviews, the current pandemic emerged as the top challenge of the fintech industry. Forty two percent (42%) or ten (10) companies responded that COVID-19 pandemic is the leading challenge in their operations. However, another fintech company that focuses on crowdfunding sees the pandemic as an opportunity as there are lots of SMEs that needs financing, and people are going and/or forced to go into digital and online transactions. Another fintech company said that sensitivity to specific culture is another challenge. However, it is something small companies (like most fintech companies are) need to embrace and use it as a strength or “selling point”. Next to ‘pandemic’ as leading challenge to fintech companies is the ‘uncertainty in the market’. Twenty nine percent (29%) voted that uncertainty in the market is another challenge. Other challenges identified were digital readiness (4 companies; 17%) and lack of innovation (3 companies; 13%).

The technology tools used by, and number of Fintech and related companies were: (a) computer as the main technology hardware tool by 38% companies, (b) artificial intelligence (AI) and other similar technologies by 17% or 4 companies, (c) information and communication technologies (ICT) by 17% or 4 companies, (d) ERP by 13% or 3 companies, (e) POS (point of sale) by 8% or 2 companies, and (f) own banking/insurance system by 8% or 2 companies. Sixty seven percent (67%) of these companies have internal software



development team and twenty five percent (25%) said that they don't have. Whereas, eight percent (8) said the they don't have idea if their company has internal development team. This last answer indicates either the respondent is a "newbee", a lower ranking personnel, simply don't want to answer the question, or indicates the incompetency of the personnel. The typical software used by the responding companies are Java (GoLink), C++, SAP (Systems, and Applications and Products).

An overwhelming majority (87.5%) expressed interest to enroll in a Fintech related master program. However, Fintech companies mentioned that they prefer experiences than degree. This is because the evolvement of new technology is always faster than the people acquiring the relevant degree, and the trend is "adaptation to technology". Therefore, a master program that is equipped with academic courses, and blended with hands-on experiences on software used in fintech companies, and emersion in fintech or related companies would produce graduates/talents who can support the manpower needs of the fintech industry. International immersion would expose students to various socio-economic cultures which would be helpful to talents before they enter into the, submit themselves to work for, and contribute to the success of fintech industry.

### *III.1.c Data Assessment by Fintech Association of the Philippines*

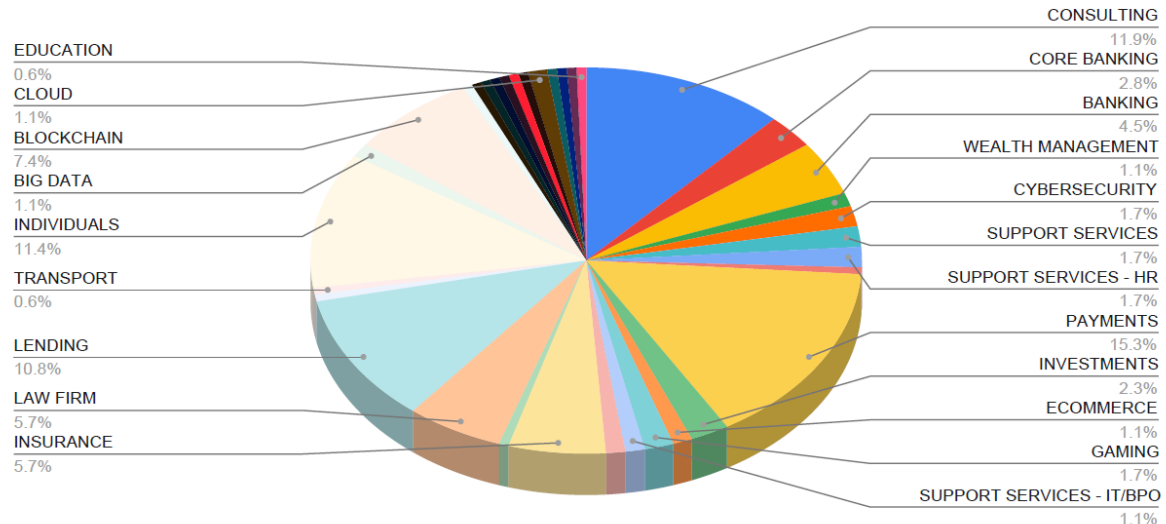
In the internal survey among 175 members of the FAP and some guests conducted in May 2020, it was found out that the current competencies of their personnel are traditional functional roles such as sales, marketing, finance, human resource and among related others. The membership breakdown of this FAP members is shown as [Figure 9](#) showing diverse sector groups in the fintech industry. These results of the internal survey translate to competencies defined for decades by the human resources team based on experience and skills patterned after traditional industries such as banking and insurance.

The result of the internal survey, plus the current pandemic situation, points to the direction of talents' skills that are shifting from traditional functional roles to technology-oriented solutions and business models in light of the post-pandemic economy. This means that fintech industry is in need of talents/manpower who have the following six (6) skills:

1. digital sales and marketing,
2. basic computer or software troubleshooting,
3. use of online tools and teleconferencing,
4. data analysis and insight,
5. managing cloud-based operations through Software-as-a-Service (SaaS),
6. utilizing logistics and e-commerce platforms.



### Fintech Philippines Association - Membership Breakdown



**Figure 9.** The Fintech Philippines Association Members

Based on the current manpower competencies and the industry needs, the following trainings, listed below, are considered critical. The set skills necessary shall be a combination of traditional functional skills with technology-based tools competencies as enumerated above.

1. Science, technology, engineering and math (STEM) advanced literacy
2. Advanced communication and social media skills
3. Critical thinking skills
4. Innovation and growth hacking
5. Project management and supervisory skills
6. High-quality software engineering/programming skills in emerging technologies
7. Blockchain, big data, and artificial intelligence/machine learning know-how
8. Cloud, internet of things (IoT), and edge computing engineering capabilities
9. Entrepreneurial management
10. Cybersecurity
11. Laws and Regulations

The Philippines financial sector is gradually moving toward open banking, cloud outsourcing, use of quick response (QR) codes, and central bank-issued digital currencies. This was attributed to the Findexable report, in which the Philippines was considered a *Watcher*. This means that Philippines was one of the 10 countries which are “fast-growing fintech destinations, and picked for their combination of local entrepreneurial success, regulatory foresight and the early signs of a growing local Fintech ecosystem” [6]. This demonstrates the Philippines' potential as a regional fintech hub. Currently with over 200 fintechs and growing, the Philippine fintech ecosystem can grow further to produce successful technology enterprises that serve the country and Southeast Asia. In addition, the Philippine Central Bank or the



Bangko Sentral ng Pilipinas (BSP)<sup>9</sup> has also crafted regulations conducive to the development of the fintech industry. All these have accelerated during the Covid-19 pandemic, which encouraged fintech adoption in financial services and pushed the country as an up-and-coming fintech hub in Asia. These regulations are:

- a. the establishment of the National Retail Payment System (NRPS),
- b. support for Virtual Currency Exchanges (VCE),
- c. issuing soon-to-be-released regulations creating a new Digital Bank category, and
- d. studying rules for an Open Banking regime

In order to keep abreast with neighboring countries and internationally, the FPA extended its research not only to Asian scenario but into the western countries. It was found out that the shift of customers practices and market needs in the Philippines was also observed in other countries. Hence, public and private universities are aligning its relevant academic program curricula to the emerging fintech market demand and global economy. It was observed that the Massachusetts public universities [3] are preparing their students for fintech by recommending the following actions to be carried out by the states. These recommended actions are as follows:

1. expand coursework and related electives to include fintech topics in machine learning, data analysis, and fintech in traditional business/finance disciplines;
2. establish professional certification programs for individuals wishing to continue their education and adapt to the changing role of fintech in finance and business;
3. create new tracks within established business and computer finance degree programs to integrate fintech topics and skills into students' educational experience;
4. plan opportunities for interdisciplinary experiences for business, computer science, engineering, and other degree candidates to develop a robust set of skills needed for fintech-related jobs.

Another, universities in Southeast Asia are also aligning their relevant academic program to the needs of fintech industry. The aligned program shall provide their students to acquire knowledge in the following topics/areas listed below and incorporate case studies in the fintech related curriculum<sup>10,11</sup>. The program is delivered through the combination of video lectures, discussion boards, assignments, quizzes, and playbook.

1. Fintech innovation

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<sup>9</sup> Diokno, B. E., (2020). Governor of Bangko Sentral ng Pilipinas (BSP, the central bank of the Philippines), Citibank's Perspectives Event, Manila, 16 September 2020. Accessed at <https://www.bis.org/review/r201005b.htm>, 17 October 2020.

<sup>10</sup> MSc in Financial Technology, (2020). The Hongkong University of Science and Technology. Available at [www.msconfintech.ust.hk/program/curriculum](http://www.msconfintech.ust.hk/program/curriculum) on 27 October 2020.

<sup>11</sup> NUS Business School, (2020). Fintech: Innovation and Transformation in Financial Services. Available at <https://programs.emeritus.org/nus-fintech/index> on October 27, 2020. National University of Singapore.



2. money and payment, digital finance and alternative finance;
3. major technology trends including cryptocurrencies, smart contracts, blockchain, AI, and big data;
4. fintech regulation and regulatory technologies: compliance ;
5. fundamental role of data and security in data-driven finance;
6. business and regulatory implications of technology for the financial industry;
7. how regulations and regulatory technologies are applied;
8. ways to analyze and evaluate what is driving technology innovation in finance;
9. how new technology impacts economies, markets, companies and individuals: risks and challenges.

Further, it was recorded that designations of manpower that Fintech industry normally hired are “manager, developer, and engineer”<sup>12</sup>. This information provide insights to educators on curriculum development or enhancement, and reflections to learners on career development.

### *III.2 The Current Competency of the HEIs to Supply Talents to Fintech Industry in the Philippines*

A total of 73 respondents from 50 HEIs over the country (Philippines) participated to the survey. This is about 21% of the 2,392 HEIs in the country. The Philippines has Luzon as the biggest island of the country. The HEIs located in Luzon are described as Northern, Central and Southern Luzon, and CALABARZON. The CALABARZON is composed of five provinces (Cavite, Laguna, Batangas, Rizal and Quezon) outskirt of National Capital Region (NCR). The NCR is also located in Luzon, too. This is where the country’s prime university belt located. Luzon island is located at the northern part of the Philippines. In addition, another area off Luzon is termed as MIMAROPA which is composed of five island provinces such as Mindoro (Occidental and Oriental), Marinduque, Romblon and Palawan. Other parts of the country are termed as ‘Central Philippines, and Southern Philippines’ for Visayas and Mindanao areas, respectively. [Table 1](#) enumerates the names and location of the participated HEIs. Based on record, there were 63% (46) and 37% (27) respondents from private and public universities, respectively.

**Table 1.** Names and Location of Higher Educational Institutions Participated in the Survey

No.	Name of HEI	Location	No.	Name of HEI	Location
1	Asian College of Technology – International	Central Philippines	26	Malayan Colleges Mindanao – A Mapua School	Southern Philippines

<sup>12</sup> Sung A., Leong K., Sironi P., O’Reilly T., McMillan A., (2019). An exploratory study of the FinTech (Financial Technology) education and retraining in UK. *Journal of Work-Applied Management*. Emerald Publishing Limited.





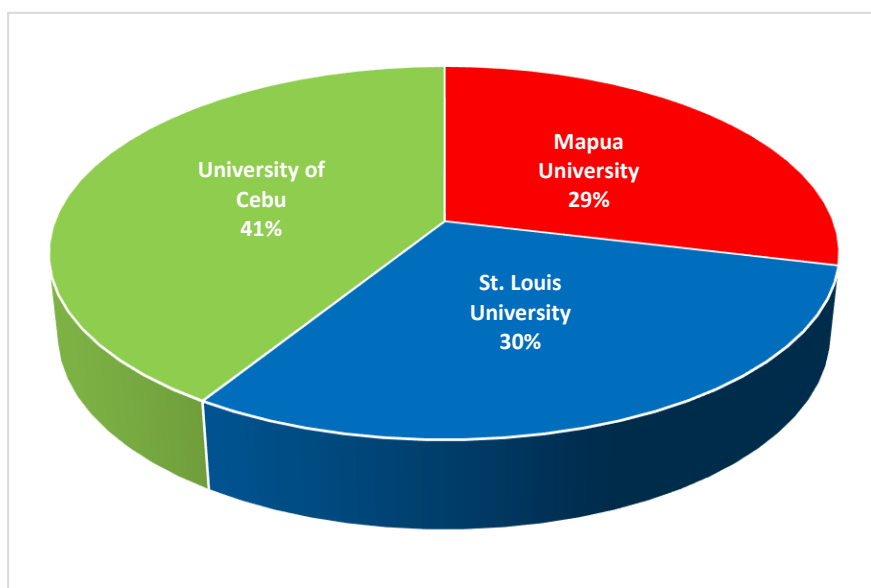
	Educational Foundation				
2	Agusan Del Sur State College of Agriculture and Technology	Southern Philippines	27	Mapua University	NCR
3	Aklan State University	Central Philippines	28	Marinduque State College	MIMAROPA
4	Apayao State College	Northern Philippines	29	Miriam College	NCR
5	Ateneo de Naga University	Southern Luzon	30	Mountain Province State Polytechnic College	Northern Philippines
6	Ateneo Graduate School of Business	NCR	31	Mindanao State University – Iligan Institute of Technology	Southern Philippines
7	Baliwag Polytechnic College	Central Luzon	32	Pangasinan State University	Central Philippines
8	Bicol State College of Applied Sciences and Technology	Southern Luzon	33	Philippine Normal University	NCR
9	Bicol University Polangui Campus	Southern Luzon	34	Romblon State University	MIMAROPA
10	Biliran Province State University	Central Philippines	35	Saint Louis College – La Union	Northern Philippines
11	Bohol Island State University	Central Philippines	36	Saint Louis University – Baguio	Northern Philippines
12	Bohol Island State University - Candijay	Central Philippines	37	Saint Mary's Angel College of Pampanga	Central Luzon
13	Camarines Sur Polytechnic College	Southern Luzon	38	Saint Mary's University	NCR
14	Cavite State University	CALABARZON	39	Samar State University	Central Philippines
15	Cebu Technological University	Central Philippines	40	St. Paul University Philippines	NCR
16	City College of Angeles	Central Luzon	41	STI West Negros University	Central Philippines
17	Central Mindanao University	Southern Philippines	42	Surigao State College of Technology	Southern Philippines
18	Colegio De Dagupan	Central Luzon	43	Tarlac Agricultural University	Central Luzon



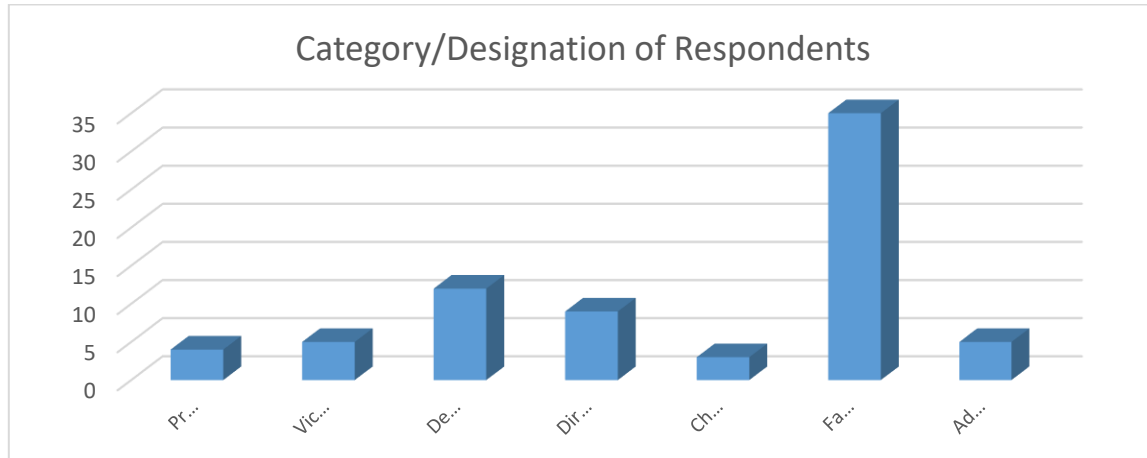


19	De La Salle University	National Capital Region	44	Technological Institute of the Philippines	NCR
20	Divine Word College of Calapan	MIMAROPA	45	University of Cebu Main Campus	Central Philippines
21	Don Mariano Marcos Memorial State University	Northern Philippines	46	University of Baguio	Northern Luzon
22	Eastern Visayas State University	Central Philippines	47	University of Cebu - Banilad	Central Philippines
23	Isabela State University	Northern Philippines	48	University of Santo Tomas	NCR
24	Lyceum of the Philippines University-Batangas	CALABARZON	49	University of St. La Salle	Central Philippines
25	Malayan Colleges Laguna	CALABARZON	50	University of Cordilleras	Northern Luzon

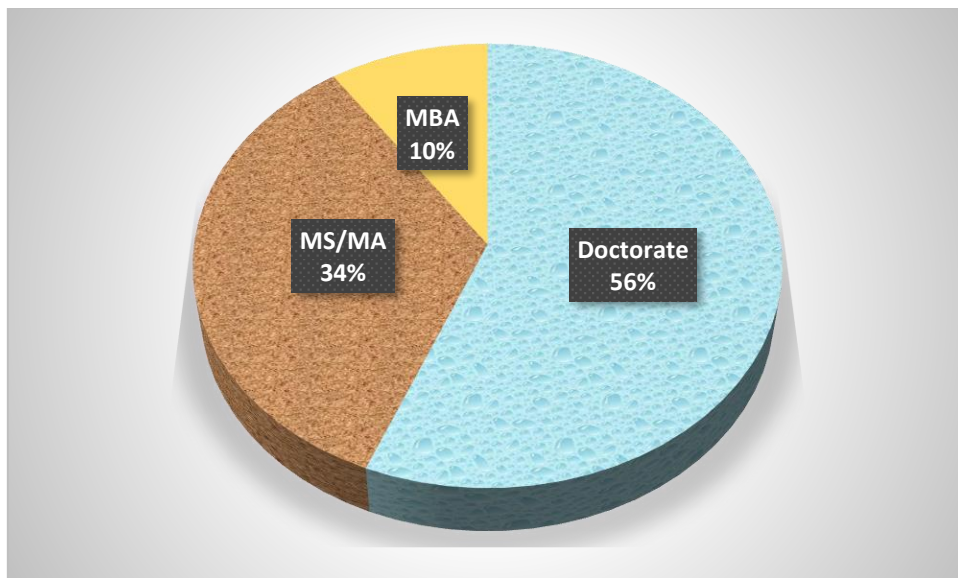
The details of contribution of each partner HEIs through the 73 total number of respondents are illustrated as [Figure 10](#). It shows that 29, 30, and 41% of the responses contributed by Mapua University, Saint Louis University and University of Cebu, respectively. The designation category of various respondents and the competency are presented as [Figure 11 and 12](#). The responses constitute the competency of the respondents, e.g., 56, 34 and 10% have doctorate, MS/MA and MBA degree. These competencies describe the reliability of collected data. In addition, the responses/information show a wide range of ideas coming from lower to higher level of academic organization.



**Figure 10.** Partner HEIs contribution with respect to the number of respondents



**Figure 11.** The category and number of respondents from HEIs



**Figure 12.** Highest Educational Attainment of Respondents

Based on the 50 HEI respondents, [Table 2](#) elaborates the general profile of these institutions in terms of the average number of academic programs offered, the average number of students per level, and the average number of faculty members. It showed that most students see the bachelor degree as necessity. Also, significant number of people who are undergraduate degree holder proceeded to seek master degree. In addition, Table 2 illustrates the faculty-student ratio of 1:34, 1:13; 1:29 and 1:4 for undergraduate, certificate/diploma, masteral and doctorate level, respectively. Further, it was recorded that only one HEI has been offering



Master in Financial Technology in the whole country; 45% (33 HEIs) did not have plan to offer, 54% plan to offer the Master program in financial technology and digital innovation.

**Table 2.** Average General Profile of the HEI Respondents

Program Level	Average No. of Program	Average Number of Students	Average Number of Faculty Members
BA/BS (undergraduate)	18	4,825	142
Certificate/ Diploma	4	368	29
MA/MS/MBA	7	1,171	41
Doctorate	3	64	18

Among the favorable responses of offering master in financial technology and digital innovation, some HEIs perceived that this master program could be offered within the next 2-5 years due to the following potential factors listed below. In addition, the motivations of the universities and colleges vary significantly as shown on [Table 3](#) and illustrated further as [Figure 13](#). However, the data illustrate that majority of the respondents see the Master in Fintech and Digital Innovation as very important for career considerations and market demand as well as for new learning. Significant number of HEIs are under autonomous status by which program could be offered upon submission of complete requirements to the Commission on Higher Education (CHED);

- (1) Dependent on how the TRUST project progresses
- (2) The need for the program to produce talents for the Fintech industry
- (3) The internal approval process of each HEI
- (4) Fund to support the Master program in Fintech and Digital Innovation

**Table 3.** The Level of Motivations of Various HEIs to Offer the Master in Fintech and Digital Innovation

Motivations	% Level of Importance				
	Not Important	Minimally Important	Somewhat Important	Important	Very Important
Demand for New Learning Career Considerations/ Market Demand	4	10	4	36	47
	5	8	7	27	52

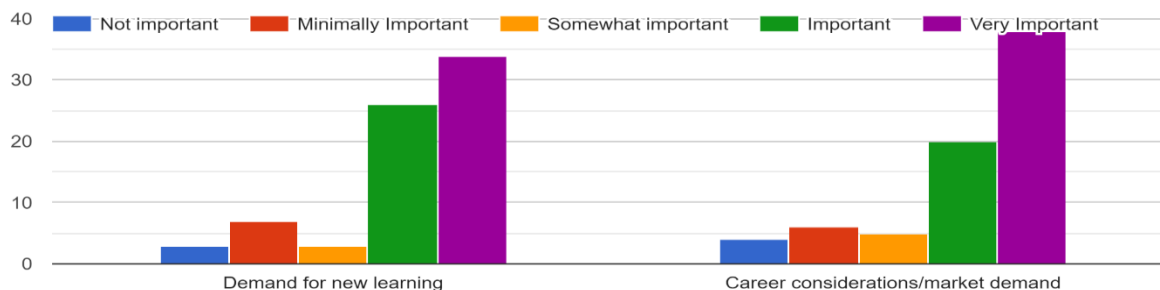
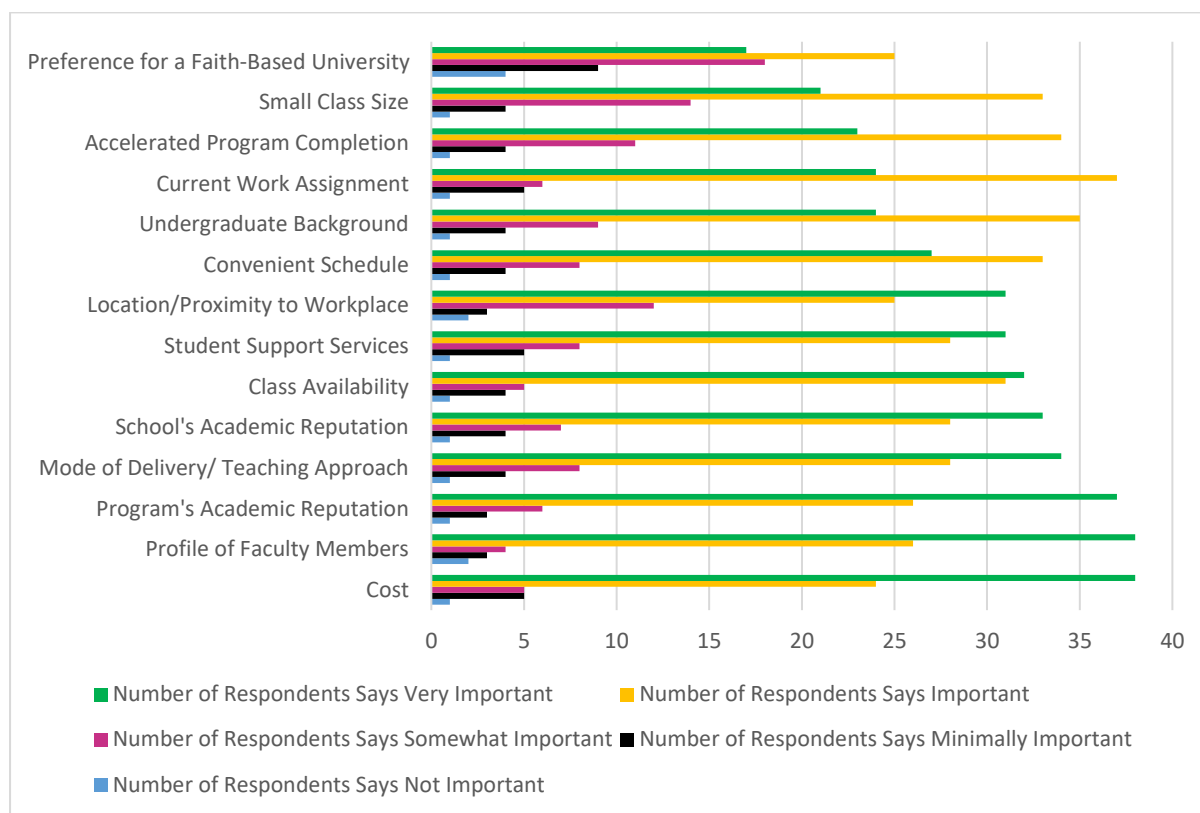


Figure 13. Response of HEIs on the Motivation to Offer MFDI

Other related programs being offered by the respondent HEIs are shown as follows: Master in Business Administration major in Financial Management, Master in Business Analytics, Master in Information Technology, Master in Financial Engineering, Master in Finance, Master in Computational Finance, Master in Business Administration, Master in Data Analytics, and master I Education Technology. Among these relevant graduate programs, it is the Master in Information Technology that is being offered most by the responding HEIs.

The factors that are considered by the prospective students to enroll in the Master program in Financial Technology and Digital Innovation, as shown in Figure 14, are (1) schools' academic reputation, (2) program's academic reputation, (3) preference for a faith-based university, (4) convenient schedule, (5) cost, (6) student support services, (7) small class size, (8) class availability, (9) accelerated program completion, (10) mode of delivery/teaching approach (interactive/workshops versus traditional academic approach) (11) profile of faculty members, (12) location/proximity to workplace, (13) undergraduate background, and (14) current work assignment. Among the factors, the number (2), (5) and (11) are the very important factors to prospective students.



**Figure 14.** Factors Considered by the Prospective Students to Enroll in MFDI Program

Among the factors that would primarily influence the decision of prospective students to enroll in MFTDI, in descending order, are shown below. In terms of HEIs capability preparedness, [Table 4](#) describes the HEIs' competency in offering fintech related master program. It describes that majority of the HEIs need minor development.

1. the cost;
2. profile of faculty members;
3. program academic reputation;
4. current work assignment
5. undergraduate background;
6. mode of delivery;
7. accelerated program completion;
8. school's academic reputation;
9. small class size;
10. class availability;
11. convenient schedule;
12. location/proximity to workplace;
13. student support service;
14. preference for a faith-based university



**Table 4.** HEIs' Capability on Technological Preparedness and Student Support Aspects

Technological Aspect	Development Needed	Percentage of HEIs, %		
		Challenging & Substantial	Developed with Some Minor Needed Development	Fully Developed
Access to computers (desktop or laptop)	7	18	44	32
Access to internet connection (at least 3 mbps)	7	25	38	30
Access to licensed software (software required by the course)	10	27	38	25
Technical competency of lecturer or professor for use of learning technologies and software	7	29	41	23

### III.2.a The Pedagogical Needs and Challenges

The respondents were asked to choose on six (6) types of program delivery. These six types were (a) fully face to face (F2F), (b) fully online, (c) hybrid format – 50% F2F, 50% online, (d) 75% F2F, 25% online, (e) 25% F2F, 75% online, and (f) NA – whichever type of delivery mode. Majority of the respondents preferred “hybrid format” or the blended delivery mode as shown as [Figure 15](#). It shall be noted that the survey was carried out during the period of COVID-19 pandemic and all academic institutions were struggling to convert the learning methods into online. In addition to the delivery mode preferences, teaching approaches preferences were also mapped out. It was recorded that the combination of traditional and interactive approaches were the most chosen modality. This is the approach of *‘teachers provides course syllabus and reading materials with activities for students to carry out for the whole period. Then, students get certificates per module.’* The second preferred modality is the *“flexible with discussion, and tiered. Teacher provides course syllabus & reading materials with activities for students to carry out for the whole period. Students get certificates per module”*. [Table 5](#) elaborates the results showing the preferences of the respondents for clearer vision. The mapping activity showed that immersion and internship activity shall be included in the program. It recorded that 51 and 32% of the respondents agreed that these two activities are important in the MFTDI and the preferred period shall be 3 – 6 months. Only 17% voted for thesis to be included as a course or student activity. The HEI responded that they have fintech related publications which give the possibility of a lifelong learning activity to be included in the program. These publications are in the areas of financial management, business analytics, data mining, artificial intelligence, statistical analysis, operations research, human-computer interaction, electronics, and application system development. Publications in



statistical analysis lead among other topics. This result is attributed to the love of numbers of the respondents. Other publications are in multi-disciplinary journals, education, flora and fauna, engineering and environmental science.

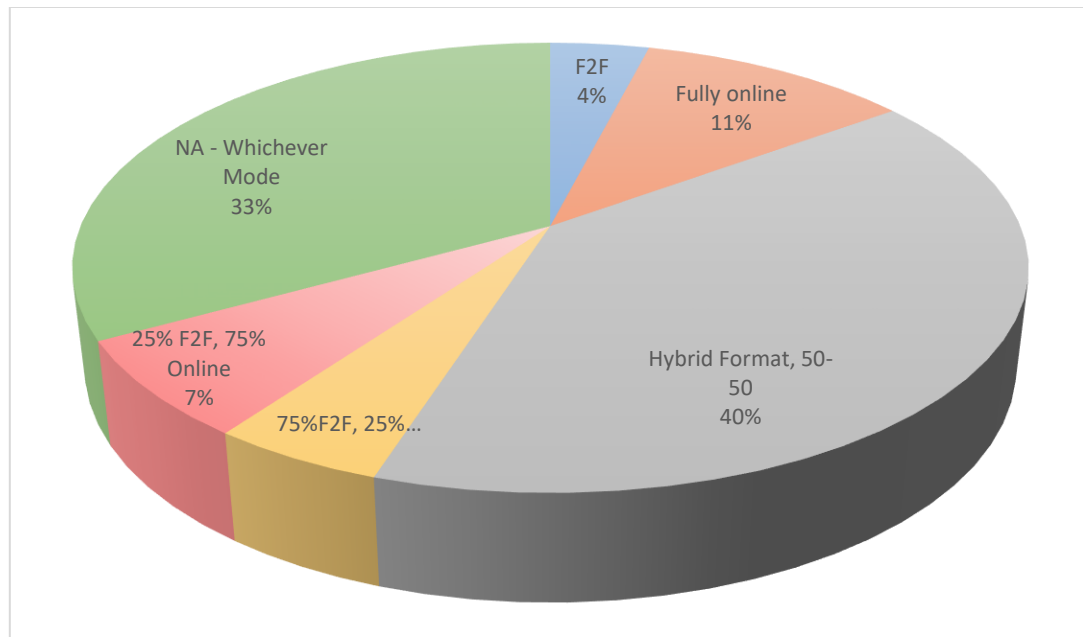


Figure 15. Preferences for the mode of delivery for MFDI

Table 5. The Teaching Approach Modality

No.	Teaching Approach Modality	%	Number
1	Traditional: Teacher is the one leading the lesson (input based)	3	2
2	Traditional with workshops, group assignments, seminar: Teacher conducts lecture and workshop with group assignments; sends students or organize seminars inviting resource person/s	3	2
3	Interactive: Teacher submits all materials with case studies to students before classes start. Then, students discuss with teacher together on academic topics and business cases.	5	4
4	Combination of traditional and interactive; teacher delivers lecture, students engage in discussion, workshops, business case studies.	47	34
5	Flexible with discussion, and tiered. Teacher provides course syllabus & reading materials with activities for students to carry out for the whole period. Students get certificates per module	26	19
6	N/A	16	12





The academic courses of the master program in the Philippines normally range in 24 – 30 credit units which are about 8 – 10 courses. Hence, the top 10 courses selected were identified. The first three top courses were: *(A) design and innovation thinking, technical solutions and financial application, and financial and risk analysis. The next top three courses selected were: (B) quantitative methods in finance, principles of finance and risk management, and data management and business intelligence. Then the next four courses were: (C) operations research, entrepreneurship principles and business planning, project and program management, Fintech ecosystem and innovation.* On the top 10 identified courses, the scoping activity analyzed the preparedness of the current faculty members. Table 6 showed that the faculty members of the Philippine HEIs need reinforcement to teach the abovementioned courses. Also, the Table 4 above showed that many of the HEIs are not prepared to offer MFTDI in terms of hard and soft infrastructure. Hence, given these data, both HEIs' infrastructure and human capital need to be retooled and reskilled.

**Table 6.** The Identified Courses and the Preparedness of the Current Faculty Members

No.	Name of Courses	Not at All	Responses, %		
			Quite Well	Very Well	Extremely Well
1	Design and Innovation Thinking	30	23	36	11
2	Technical Solutions and Financial Applications	29	38	21	12
3	Financial and Risk Analysis	27	27	33	13
4	Quantitative Methods in Finance	19	40	25	16
5	Principles of Finance and Risk Management	18	40	25	17
6	Data Management and Business Intelligence	25	32	32	11
7	Operations Research	21	34	25	20
8	Entrepreneurship Principles and Business Planning	11	30	38	21
9	Project and Program Management	15	30	34	21
10	Fintech Ecosystem and Innovation	37	40	15	8





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### III.3 The Secondary Data Assessment

Results on the secondary data assessment showed that among the 2,392 of HEIs in the Philippines, only two universities have academic program directly related to master in fintech and digital innovation. De La Salle University offers Master of Science in Computational Finance, Master of Science in Financial Engineering, and Diploma in Financial Engineering. Whereas, Mapua University is offering Master in Business Analytics. The University of the Philippines offers Master of Science in Finance, and other HEIs offer Master in Financial Management.

In the case of Mapua University, it (now) requires all engineering programs to include 'Data Science' course in the curriculum. This is to expose their students on the use of scientific methods, algorithms and systems to extract insights from structures and un-structured data. These are among the skills required by fintech industry from their potential manpower needs. Saint Louis University and University of Cebu have instituted hackathons, mentorship programs and incubators. These three TRUST HEI partners (Mapua, SLU, and UC) establish accelerator programs to enhance the fintech-related skills of their students. Apart from these strategies installed in HEIs' infrastructure, it was noted that nine technologies or technology-enabling trends that, individual or collectively, facilitates current and future fintech innovations<sup>13</sup>. These are the following:

1. cloud technology
2. process and service externalization
3. robotic process automation (RPA)
4. advanced analytics
5. digital transformation
6. blockchain
7. smart contracts
8. artificial intelligence (AI)
9. internet of things (IoT)

The above mentioned technologies, described by Ernest and Young (2016), have not been fully introduced or applied by companies, and not fully focused in HEIs except for the AI, IoT, and analytics. Hence, there is a need to incorporate these technologies or technology-enabling trends into the existing academic curriculum of fintech related undergraduate and

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<sup>13</sup> Ernest and Young, (2016). Capital Markets: Innovation and the Fintech landscape. Available at [http://www.ey.com/Publication/vwLUAssets/EY-capital-markets-innovation-and-the-fintech-landscape/\\$FILE/EY-capital-markets-innovation-and-the-fintech-landscape.pdf](http://www.ey.com/Publication/vwLUAssets/EY-capital-markets-innovation-and-the-fintech-landscape/$FILE/EY-capital-markets-innovation-and-the-fintech-landscape.pdf) October 26, 2020.



graduate programs, or offer a new graduate program such as master in financial technology and digital innovation.

Another set of data which the HEIs were able to collect, that are important to the development of MFTDI, was the Philippines statistics of the financial services industry in the context of digital technology. Among the about 110 Million population size<sup>1</sup> only 31%<sup>14</sup> have bank account, 4% did online bill payments/transactions, average internet speed of only 15.19 mbps, mobile penetration of 58% and connectivity score of 61.60/100. These data are associated with the weak use of digital technology. Hence, refocusing people into the use of digital technology for financial services and investments is important to the country's economic stature.

Furthermore, there is a need for companies to expand their technology tools, aside from computers, on the use of fintech innovative tools. Establishment of RDI offices, or strengthening of RDIs in the university and utilize by industries, would act as catalyst in pursuing the near future needs of the fintech industry and the appropriate strategies of the HEIs on their related academic curricula.

### III.4 The Pedagogy of Master in Fintech and Digital Innovation

Based on the information elaborated in Sections I, II and III, the suggested program educational objectives (PEO) and program outcomes (PO) are listed under subsection A and B, respectively. Potential positions or designations are listed under subsection C. Results of the mapping of courses anchored with the industry needs and market trends (Table 7) illustrates the prospective clusters of courses and the prospective software.

#### A] Program Educational Objectives

- 1. produce graduates equipped with holistic financial technological skills, cross-functional perspective, entrepreneurial mindset and lifelong learning;*
- 2. graduates who will be able to engage in the design, development and implementation of innovative technologies and adaptation to emerging software applications.*

#### B] Program Outcomes

- 1. demonstrate skills and knowledge capable of creating fintech and/or fintech related start-ups;*
- 2. capable of, prompt recognition to financial technology trends, and early identification of financial risks through the use of emerging technologies.*

#### C] Potential Positions/Designation in Various Companies

- 1. Account Manager, Product Manager*
- 2. Compliance Head; Data Analytics Head;*

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<sup>14</sup> World Bank, (2018). We are social 2018



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3. *Fintech Software Development Head;*
4. *Fintech and Trading Consultant;*
5. *Software Developer,*
6. *Finance and Data Analyst*
7. *Entrepreneurs*

### III.5 The Minimum Academic Requirements

The total program credits may be in the range of 24 - 36 units with interactive teaching approach and workshop. The cluster of courses shall be core or the required courses, the major or professional courses, and the electives. The university offering a degree may offer more than 36 units for the program, and may include several courses as elective courses. The credit units written on the second column from the left of Table 7 are minimum credit units. The teaching modality preferred by the respondents were blended such as 50% online and 50% F2F. The degree giver university has the option to align the PEOs and POs with their existing institutional PEOs and POs. Based on the courses, we search for the software applications that are being used on those courses and are described through the links provided on the right most column of Table 7.



Table 7. Mapping of Courses and its Clusters

Prospective Course Cluster	Proposed Course Units/ Credits	Courses  Legend: R = required I = interactive (with workshop &/or Laboratory) E = Electives M = Major	Science, technology, engineering and math (STEM) advanced literacy	Advanced communication and social media skills	Critical thinking skills	Innovation and growth hacking	Project management and supervisory skills	High-quality software engineering/ programming skills in emerging	Blockchain, big data, and AI/machine learning know-how	Cloud, internet of things (IoT), & edge computing engineering capabilities	Entrepreneurial management	Cybersecurity	Laws and Regulations	Fintech Tools/ Software
			Skills of Talents that Fintech Industry Needs											
Core (R)	2 (I)	Design and Innovation Thinking	x	x	x	x								Sprintbase Open Design Kit
Major	3	Technical Solutions and Financial Application	x	x	x	x		x	x	x				
Major	2 (I)	Financial and Risk Analysis	x		x	x								<a href="https://www.capterra.com/financial-risk-management-software/?pricing_options=%5B8%5D&amp;sortOrder=sponsored">https://www.capterra.com/financial-risk-management-software/?pricing_options=%5B8%5D&amp;sortOrder=sponsored</a>
Elective		Quantitative Methods in Finance	x		x									Excel
Core (R)	2	Principles of Finance and Risk Management	x		x	x								<a href="https://www.capterra.com/financial-risk-management-software/?pricing_options=%5B8%5D&amp;sortOrder=sponsored">https://www.capterra.com/financial-risk-management-software/?pricing_options=%5B8%5D&amp;sortOrder=sponsored</a>



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Major	3 (I)	Data Management and Business Intelligence	x		x	x		x	x	x				<a href="https://research.aimultiple.com/data-management-tools/">https://research.aimultiple.com/data-management-tools/</a>
Major	2 (I)	Operations Research	x		x									
Major	3	Entrepreneurship Principles and Business Planning	x		x		x				x			
Major	2	Project and Program Management	x		x		x							
Core (R)	3	Fintech Ecosystem and Innovation	x		x	x								<a href="https://sea.pcmag.com/old-project-management/6231/the-best-project-management-software-for-2020">https://sea.pcmag.com/old-project-management/6231/the-best-project-management-software-for-2020</a>
Core (R)	2	Cybersecurity and Regulations										x	x	
(R)	3	Capstone/Immersion	x	x	x	x	x	x	x	x	x	x	x	

Other courses that may be included depending on the offering HEI are: algorithmic trading and robo-advisors, python programming, advanced natural language processing and deep learning, probability and statistics, data management and business intelligence, information retrieval and analysis, anti-financial crime and compliance, time series analysis, data mining, applied cryptography, cloud technology; process and service externalization, robotic process automation (RPA); advanced analytics, digital transformation, smart contracts, hardware troubleshooting, marketing and communication effectiveness, people management, negotiation principles, venture creation and start up. The educators were then assessed and evaluated on their preparedness to teach the hard core and emerging technical courses. Results showed that majority of the faculty respondents are not prepared to teach majority of the technical courses as illustrated by Figure 16. Therefore, educators need for trainings in these courses and/or import professors from neighboring countries.

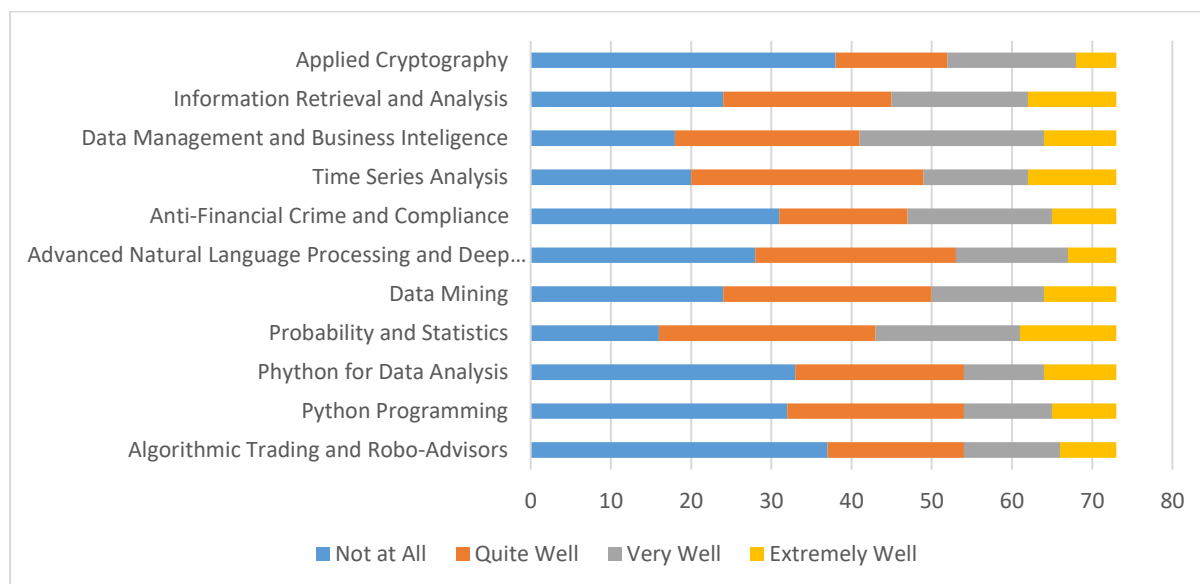


Figure 16. Preparedness of faculty members to teach technical courses for MFDI

#### IV. Summary, Conclusion and Proposal

The Philippines has a total of 2,392 HEIs and over 200 fintech companies. Seventy three from HEIs and twenty four fintech and related companies participated in the scoping study. It was recorded that the entry level skills required by the fintech and related companies are communication and business/finance skills with knowledge in analytics, problem solving, selling, design thinking, information technology, business and operation, product and engineering. The hard core fintech companies need Talents who are adaptable to technology with financial background. The technical competencies of the Talents which fintech industry needs are management engineering, management information system, programming languages, database, infrastructure, server maintenance, mobile App development, UI, and UX design. According to fintech industry, they prefer experiences than degree. Based on the internal survey of FAP, the skills which the industry need are: digital sales and marketing, basic computer or software troubleshooting, use of online tools and teleconference, data analysis and insights, managing cloud-based operations through SaaS, and utilizing logistics and e-commerce platforms. The technologies and/or technology-enabling trends are: cloud technology, process and service externalization, robotic process automation, advanced analytics, digital transformation, blockchain, smart contracts, artificial intelligence, and internet of things. The tools used are computer, AI, ICT, ERP, POS, and own banking/insurance system. The software that are commonly used are Java, C++, and SAP.

On the challenges that were recorded, the COVID-19 pandemic was recorded the most challenging concern in both the industry and HEIs. Uncertainty in the market was also



recorded. Also, culture was mentioned but this shall be embraced as selling point. Another are the lack of digital readiness and innovation skill of the available human capital.

Given the abovementioned necessary skills that the fintech industry needs, majority of the respondents from HEIs 50 HEIs wrote that they are not prepared to teach these tools/ technologies. Hence, it is not only a master degree program shall be developed but also specialized short term courses for faculty members who need retooling. In addition, existing fintech relevant programs shall be reinforced with the financial technology-enabling trends courses. The program shall incorporate workshop/s, immersion related activities as teaching modality, and various fintech courses including capstone course. The program could include the developed BEEHIVE MOOC on entrepreneurship. It is proposed that the capstone course shall compose of two courses, i.e., Capstone 1 and 2 with the following student outcomes:

1. Capstone Course 1
  - a. Acquire the technoentrepreneurial mind set;
  - b. Able to prepare business model;
  - c. Capability to deliver pitching activity
2. Capstone Course 2
  - a. Students capable to implement start-up activity
  - b. Students acquire domestic trade industry (DTI) registration

Competency requirements by the industry are leaning towards technological capacity building of the existing manpower, the restructuring of the existing relevant academic programs and the retooling of the educators who are in the finance, business and information technology programs shall be carried out by all means. The courses and the tools for faculty members competency upgrading are as shown below. We can call these as the “Critical 12”.

1. Advanced analytics
2. AI
3. Blockchain
4. Cloud technology
5. Digital transformation
6. ERP
7. Java
8. POS
9. Process and service externalization
10. Python
11. RPA
12. SaaS

The Philippines financial system is like a wholesale digital transformation and Fintech is an upswing industry sector, its job market and likewise the skills requirements. Therefore, the offering of MFTDI and relevant/related short term course is currently critical.





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## INTERVIEW GUIDE QUESTIONS

This interview is administered in the Philippines and Vietnam to determine the current and future manpower needs to support the financial services industry in the Philippines and Vietnam. This activity is part of the TRUST project co-funded by the European Union Erasmus Plus Programme. TRUST project is a consortium of four European institutions (i.e., two from Italy, one from the United Kingdom and one from Serbia), three from Vietnam and four in Philippines which aim to develop a master degree program on financial technology and digital innovation.

This interview will take about 15-20 minutes of your time. The information from this interview will provide vital information for institutional planning for the development of the academic program. Your participation is completely voluntary, and your responses will be held in strict confidentiality. TRUST project will help Vietnam and Philippines improve its capability and competency in providing human resources who are technologically competent to support financial services industry.

*With the submission of the information, I authorize the processing of personal data for archiving purposes in the TRUST scientific research having regard to Article 156 of the Regulation 2016/679/EU of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC ("GDPR").*

### **A] General Knowledge: Company Background**

1. Can you describe your company to us in terms of core business, mission, vision, and values?
2. What are the services of your company offer? What makes your company different from others?
3. Who are your competitors and what is your position in the market with regards to the market share and potential future growth?
4. How many personnel currently do you have? And, what makes your personnel stay with your company?

#### **[Should there is time and participant is willing to answer more question/s.]**

5. What do you expect would be the growth trend in the next 3 years?
6. Do you have a dedicated internal office covering research, development and innovation (RDI)?
7. How much of the total budget does the company allocate to RDI in terms of %?





### ***B] Personnel Competency and Challenges***

1. Based on the services your company offer, can you describe the minimum manpower entry level skills do you need to support the services you offer?
2. Can you describe the manpower skills do you need to advance your company from your competitors, and to support future needs?
3. Can you describe the types of academic degree/competencies and skills do your current personnel have?
4. What challenges does your company are currently encountering?
5. Can you describe the kind of academic degree/competencies and preparation your personnel shall have to address the current and future challenges?

### ***C] Technological Tools and Services***

1. What are the main technology tools used in the company? Why?
2. Do you have an internal software development team? Which language is the most used?
3. Can you make additional inputs into the list of financial technology tools which various higher educational institutions provide students with general knowledge on blockchain, python, probability and statistics, language processing, scorm, sandboxing?
4. What can you say about letting your personnel go to master program in financial technology and digital innovation? This master program will produce people who would have literacy in finance, technology, regulations, and innovation.
5. What do you expect from your employee/personnel after graduation from the program?



## APPENDIX

### A] Some Relevant Academic Course

Courses	
Introduction to Fintech	Operations Research
Fintech Ecosystem and Innovations	Time Series Analysis
Principles of Finance and Risk Management	Data Management and Business Intelligence
Algorithmic Trading and Robo-Advisors	Information Retrieval and Analysis
Blockchain Systems: Concepts and Principles	Applied Cryptography
Python Programming	Design and Innovation Thinking
Python for Data Analysis	Entrepreneurship Principles and Business Planning
Probability and Statistics	Project and Program Management
Data Mining	People Management
Advanced Natural Language Processing and Deep Learning	Negotiation Principles
Quantitative Methods in Finance	Marketing and Communication Effectiveness
Regulatory Technology	Venture Creation and Startup
Anti-Financial Crime and Compliance	Technical Solutions and Finance Applications
Financial and Risk Analytics	

### B] Some Related Products and Services

Products and Services	
Digitalization and Data driven operations	Money Transfers
New Technology platform	Alternative Data and credit Services
Blockchain	Updated lending Platforms
APIs	Payment Provider and Remittances
Mobile Apps	Ease of Doing Business
eKYC	Online Insurance selling
Events and Partnerships	Data Privacy
Mobile wallet	Taxation and Incentives
Digital Banking Services	Cybersecurity
New Insurance Platform and Products	Open Banking
Payroll Services	Others



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## Master's Program in Financial Technology Interest Survey

This survey is being administered in the Philippines and Vietnam which aims to assess professors and universities' staff training needs on Financial Technology (FinTech) and Digital Innovation. This activity is part of the TRUST project co-funded by the European Union Erasmus Plus Programme. TRUST project is a consortium of four European institutions (two from Italy, one from the United Kingdom and one from Serbia), three from Vietnam and four in Philippines.

This questionnaire should take about 5-7 minutes and will provide vital information for institutional planning. Your participation is completely voluntary and your responses will be held in strict confidentiality. TRUST project will help Vietnam and Philippines higher educational institutions improve its professors/lecturers' capability and competency in teaching and providing human resources who are technologically competent to support financial services industry. Kindly put an "X" on the relevant spaces provided below.

The questionnaire asks about information on:

- The financial technology program or any related program offered in your university
- Important factors for prospective students of Master in Financial Technology program
- The use of information technology, software and the obstacles in this area
- Pedagogical practices
- Fintech Preparedness – Course Offerings

### *I] About the University and Respondent*

Name of the University: \_\_\_\_\_

Site Address: \_\_\_\_\_

Type of University (Public/Private): \_\_\_\_\_

Profile of the University:

	No. of Programs	No. of Students	No. of Faculty
BA/BS			
Certificate/Diploma			
MA/MS			
PhD			

Respondent: \_\_\_\_\_

Position: \_\_\_\_\_

Highest Education: \_\_\_\_\_

Email: \_\_\_\_\_

Telephone Number: \_\_\_\_\_



*II] About the Master in Financial Technology program*

1. Does your university offer a Master's program in Financial Technology and Digital Innovation?
- a. Yes                      b. No

If yes, fill up below table. You may add table should you have more than one active program. If No, go to question 2; also on page 4, omit question V.7 and proceed to V.8

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Duration (in years and hours)	
N° of students	

2. Does your university have a plan to offer a Master's program in Financial Technology and Digital Innovation?
- a. Yes                      b. No

If yes, when do you plan to offer the program

Next semester	Next year	In 2 or 3 years	In 4 or 5 years

3. What do you think is the motivation of your university to offer the Master's program in Financial Technology and Digital Innovation? Or motivation to offer this graduate program in the future?

	Not important	Minimally important	Somewhat important	Important	Very important
Demand for new learning					
Career considerations/market demand					



4. What graduate program/s does your university currently offer that is/are related to Financial Technology and Digital Innovation?

Graduate Program	Year Offered; (Put X if not being offered)
MBA major in Financial Management	
Master in Business Analytics	
Master in Information Technology	
Master in Financial Engineering	
Master in Finance	
Master in Computational Finance	
Other (Pls specify)	

*III] Important factors for prospective students of Master in Financial Technology and Digital Innovation program*

5. How important are the following factors for prospective students of Master in Financial Technology and Digital Innovation program?

	Not important	Minimally important	Somewhat important	Important	Very important
School's academic reputation					
Program's academic reputation					
Preference for a faith-based university					
Convenient schedule					
Cost					
Student support services					
Small class size					
Class availability					
Accelerated program completion					
Mode of delivery/Teaching Approach (interactive/ workshops versus traditional academic approach)					
Profile of faculty members					
Location/Proximity to workplace					
Undergraduate background					
Current work assignment					



*IV] The use of information technology, software and obstacles in these areas*

6. In your opinion, how developed is your university capability for the following technological aspects?

	Development Needed	Challenging and Substantial	Developed with Some Minor Development Needed	Fully Developed
Access to computer (desktop or laptop)				
Access to internet connection (at least 3Mbps)				
Access to licensed software (software required by the course)				
Technical competency of lecturer or professor for use of learning technologies and software.				

*V] Pedagogical practices*

7. A] What is the current delivery mode of your Master in Financial Technology and Digital Innovation program? Or your proposed delivery mode in the future?

Fully face-to-face (F2F in-class) program	Fully on-line program	Hybrid format (50% F2F, 50% online)	75% F2F, 25% online	25% F2F, 75% online

8. Do you think the teaching approach (style and modality of delivery) is also relevant component for the student decision on the Master program?

If YES, what do you think would be the best teaching approach/modality to adopt for the Master program effectiveness? Please mark X on the space provided on the table below. If answer is NO, please mark N/A and proceed to question 9.



Traditional: Teacher is the one leading the lesson (input based)	Traditional with workshops, group assignments, seminar: Teacher conducts lecture and workshop with group assignments; sends students or organize seminars inviting resource person/s.	Interactive: Teacher submits all materials with case studies to students before classes start. Then, students discuss with teacher together on academic topics and business cases.	Combination of traditional and interactive: teacher delivers lecture, students engage in discussion, workshops, business case studies.	Flexible with discussion, and tiered: Teacher provides course syllabus & reading materials with activities for students to carry out for the whole period. Students get certificates per module.

9. Which course/activity you think shall be included in the Master Program for Financial Technology and Digital Innovation?

Internship	Immersion	Thesis

10. How long shall be the internship or immersion should you think is necessary to Master in Financial and Digital Innovation program?

< 3 Months	3 – 6 Months	> 6 Months

#### VI] FinTech-related researches

11. Does your university have FinTech-related publications (ISI or Scopus)?  
(Financial Management, Business Analytics, Data Mining, etc)

Research Area	No. of publications
Financial Management	
Business Analytics	
Data Mining	
Artificial Intelligence	
Statistical Analysis	
Operations Research	
Other (pls specify)	





## VII] Fintech Preparedness – Course Offerings

12. How important are following courses for a competitive future oriented Master in Financial Technology and Digital Innovation?

Courses	Not at all	Important	Very Important	Extremely Important
Introduction to Fintech				
Fintech Ecosystem and Innovations				
Principles of Finance and Risk Management				
Algorithmic Trading and Robo-Advisors				
Blockchain Systems: Concepts and Principles				
Python Programming				
Python for Data Analysis				
Probability and Statistics				
Data Mining				
Advanced Natural Language Processing and Deep Learning				
Quantitative Methods in Finance				
Regulatory Technology				
Anti-Financial Crime and Compliance				
Financial and Risk Analytics				
Operations Research				
Time Series Analysis				
Data Management and Business Intelligence				
Information Retrieval and Analysis				
Applied Cryptography				
Design and Innovation Thinking				
Entrepreneurship Principles and Business Planning				
Project and Program Management				
People Management				
Negotiation Principles				
Marketing and Communication Effectiveness				
Venture Creation and Startup				
Technical Solutions and Finance Applications				



13. How well are you prepared to deliver/teach the following courses?

Courses	Not at all	Quite Well	Very Well	Extremely Well
Introduction to Fintech				
Fintech Ecosystem and Innovations				
Principles of Finance and Risk Management				
Algorithmic Trading and Robo-Advisors				
Blockchain Systems: Concepts and Principles				
Python Programming				
Python for Data Analysis				
Probability and Statistics				
Data Mining				
Advanced Natural Language Processing and Deep Learning				
Quantitative Methods in Finance				
Regulatory Technology				
Anti-Financial Crime and Compliance				
Financial and Risk Analytics				
Operations Research				
Time Series Analysis				
Data Management and Business Intelligence				
Information Retrieval and Analysis				
Applied Cryptography				
Design and Innovation Thinking				
Entrepreneurship Principles and Business Planning				
Project and Program Management				
People Management				
Negotiation Principles				
Marketing and Communication Effectiveness				
Venture Creation and Startup				
Technical Solutions and Finance Applications				



## APPENDIX COURSE DESCRIPTION

### I] Core Courses

#### 1. Introduction to Fintech (Source: Nanyang Technological University)

This course gives an overview of all the changes, which are happening now in the financial industry and discusses how some of the FinTech processes are being constructed. Each FinTech disruption concept is based on a mathematical or behaviour concept, which is backed by data, analysis and technology. This course goes into detail into some of these processes, so give an understanding as to what is the business model, skill, and future of FinTech in the financial services industry. It will also cover the recent progresses on FinTech development and applications. Although the topics may vary in order to keep pace with the FinTech development, they mainly involve case studies, practical challenges, trends, and opportunities in a FinTech career.

#### 2. Fintech Ecosystem and Innovations (Source: Nanyang Technological University)

This course discusses the existing and future landscapes of FinTech in Singapore, from incumbent financial firms to FinTech startups. Both traditional and new players are working with policy-makers to define the ecosystem, to encourage innovation, adoption while maintaining regulatory oversight.

#### 3. Algorithmic Trading and Robo-Advisors (Source: Nanyang Technological University)

This course covers the quantitative methods to construct computer-based algorithms for automatic trading and asset management. A number of notable algorithmic trading strategies are discussed. This course also emphasizes the rationale behind the winning strategies, backtesting, automated execution and how to build robots for trading and asset management with specific goals. Moreover, the course provides a hands-on experience of implementing the financial solutions with real market data.

#### 4. Blockchain Systems : Concepts and Principles (Source: Nanyang Technological University)

This is an introductory course that attempts to answer the following questions: What is blockchain? What does blockchain aim to achieve? What are the useful properties of blockchains? What are the building blocks of blockchain? What are the design principles underlying the building blocks of blockchain? What are the use cases for blockchains? What is cryptoasset and cryptocurrency? How to evaluate cryptoasset/cryptocurrency? What is Bitcoin? What is the relationship between Bitcoin and blockchain?



## 5. Python Programming (Source: Nanyang Technological University)

Python is an easy to learn higher level scripting language that can be used across many different platforms. As such, it is a common choice to code for FinTech products. This course will train the student for programming in python, with particular focus in FinTech applications.

## 6. Python for Data Analysis (Source: Nanyang Technological University)

This course builds upon the Python basics, covered in MH8811 Python Programming, to understand a more comprehensive use of Python with its famous libraries, such as Numpy, Pandas, Matplotlib, Seaborn, and Scikit-learn. This course will train the students for Python programming skills for data analysis.

## 7. Probability and Statistics (Source: Nanyang Technological University)

Probability, conditional probability; random variables, joint distributions, conditional distributions and independence; probability laws, multivariate normal distribution; order statistics; convergence concepts, the law of large numbers, central limit theorem. Estimation, Bayes estimators, interval estimation including confidence intervals, prediction intervals, Bayesian interval estimation; Hypothesis testing, likelihood ratio tests; Bayesian tests; Nonparametric methods, bootstrap.

## 8. Data Mining (Source: Nanyang Technological University)

The knowledge discovery process. Data preparation including data cleaning, outlier analysis and transformation. Statistical techniques: regression modelling, multivariate statistics, statistical inference. Supervised and unsupervised learning techniques including decision tree induction, nearest neighbour categorisation, cluster analysis, association analysis, support vector machines, Bayesian learning and neural networks. Data mining software and tools. Applications of data mining to complex data types.

## II] Elective Courses

### A] Artificial Intelligence Elective Courses (Source: Nanyang Technological University)

#### 1. Advanced Natural Language Processing with Deep Learning (Source: Nanyang Technological University)

In this course, students will learn state-of-the-art deep learning methods for Natural language processing (NLP). Through lectures, practical assignments and projects, students will learn the necessary tricks for making their deep learning models work on practical problems. They will learn to implement, and possibly to invent their own deep learning models using available deep learning libraries.



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## 2. Quantitative Methods in Finance (Source: Nanyang Technological University)

This course covers basic and essential quantitative methods in finance. A number of mathematical and statistical techniques are introduced. This course emphasizes the applications of the quantitative methods in two important areas in finance: asset management and derivative pricing.

## 3. Blockchain Systems II : Development and Engineering (Source: Nanyang Technological University)

This course builds upon the basic blockchain knowledge discussed in the introductory course to understand the most popular blockchain networks: Ethereum. It covers the mechanics of Ethereum and how it aims to become a global computer through its artifact smart contracts. We will learn one of the languages for smart contract: Solidity and use this to code smart contracts. With these tools, we explore the processes and principles of building decentralized apps on the Ethereum platform.

## B] Operations and Compliance Elective Courses (Source: Nanyang Technological University)

### 1. Regulatory Technology (Source: Nanyang Technological University)

Regulations are essential to ensure good governance in the finance industry. FinTech aiming to replace existing financial services will be subject to the same regulations. RegTech, short for regulatory technology, aims to simplify the compliance process, providing large savings in face of rising compliance costs. This course introduces the myriad of financial regulations, both for traditional financial services as well as new regulations introduced to cover novel FinTech services. The potential of RegTech for cost reduction will also be discussed.

### 2. Anti-Financial Crime and Compliance (Source: Nanyang Technological University)

Financial Crime Compliance and Regulatory Compliance are probably at the top of nearly every financial institution's risk review process and have become the key strategic imperatives for all board members. This course provides a robust training in Know your customer (KYC) and Customer Due Diligence (CDD) processes by drawing on cutting-edge experience of what world's leading financial institutions are doing, have done, and must still do. In addition, this course covers the incorporation of the new technologies into the KYC and CDD processes.



### 3. Financial and Risk Analytics I (Source: Nanyang Technological University)

Techniques for measuring and managing the risk of trading and investment positions for positions in equities, credit, interest rates, foreign exchange, commodities, vanilla options, and exotic options; risk sensitivity reports, design of static and dynamic hedges, measure value-at-risk and stress tests; Monte Carlo simulations determining hedge effectiveness; case studies.

### CJ Other Elective Courses (Source: Nanyang Technological University)

#### 1. Operations Research (Source: Nanyang Technological University)

These courses introduce a number of optimization methods commonly used in operations research. Nonlinear optimization, discrete optimization, stochastic optimization, queuing theory, inventory theory, dynamic programming, simulation, applications.

#### 2. Time Series Analysis (Source: Nanyang Technological University)

Many of the business systems are dynamic systems in which their states change over time. This course introduces time series models and associated methods of data analysis and inference. Topics include auto regressive (AR), moving average (MA), ARMA, and ARIMA processes, stationary and non-stationary processes, seasonal processes, identification of models, estimation of parameters, diagnostic checking of fitted models, forecasting, and spectral analysis. Real-world applications for understanding characteristics of time series data in economics, finance, management and industries, and modelling and evaluating forecasts upon which decision-making would depend are emphasized with lab on using SAS.

#### 3. Data Management and Business Intelligence (Source: Nanyang Technological University)

This course explores management, organizational, and technological issues in the ways data are stored, managed and applied in businesses. Using a simulated business, the database module covers data concepts, structures, conceptual and physical design techniques, data administration and data mining. Theory and practice of database management systems are integrated through hands-on experience with the design and implementation of a business solution. By the end of the course, participants will gain critical IT skills in analysing business processes, improving these processes, developing business applications with an industry standard database and use data for business requirements.

#### 4. Information Retrieval and Analysis (Source: Nanyang Technological University)

Representation, storage, and access to very large digital document collections: issues, data structures and algorithms. Information retrieval models including Boolean, vector space and probabilistic models. Indexing and retrieval techniques. Evaluation of information retrieval systems. Text and Web mining: content, structure and usage mining. Web search: search





engines, spiders, link analysis, agents. Recommender systems and intelligent information retrieval. Information extraction and integration.

#### 5. Applied Cryptography (Source: Nanyang Technological University)

This course explores cryptographic primitives, and how these are used in building secure protocols. These include symmetric ciphers, cryptographic hashes, one-time pads, public key cryptography and pseudorandom number generators.

#### 6. Design and innovation thinking (Source: Deus Technology)

Design thinking is a powerful process of problem solving that begins with understanding unmet customer needs. That insight triggers a process for innovation that encloses development, applied creativity, prototyping, and experimentation. When design thinking approaches are applied to business, the success rate for innovation improves substantially. The overall goal of this design thinking course is to design better products, services, processes, strategies, spaces, architecture, and experiences.

The objective of the course will be to guide students on a path of understanding of the framework that modern companies, on the basis of their needs in terms of speed and scalability, uses to collaborate, align teams, define intent, solve users' problems and to improve customer experience. These principles include: solution-focused and action-oriented approach; focus on user results; shared responsibility; continuous reinventions.

#### 7. Entrepreneurship principles and business planning (Source: Deus Technology)

The course will expose the relevance of Entrepreneurship as a process creating value for a plurality of stakeholders, from the entrepreneur him/herself to employees, customers, partners and the surrounding community. It is therefore of key importance to provide student with a complete understanding of how and why the entrepreneurial process unfolds and what its effects are.

The course will address the following contents:

- what are the factors that facilitate company opportunity recognition;
- the notion of business model and frameworks to design it;
- the main tools to design compelling value proposition and targeting customer segments and business plans
- the start-up ecosystem: lean business model, funding options, the methodology to be employed by start-ups when planning their entrance in the market
- the business plan: the key dimensions for a detailed description of the business.





#### 8. Project and program management (Source: Deus Technology)

The course aims to provide students with fundamental concepts and main methods of Project Management and analyses all its typical processes.

The course will review the relevant techniques and tools used in project management providing student with the opportunity to interpret and process independent judgments on matters concerning planning, management, control and accounting; acquire a technical language that enables students to communicate effectively with C-levels typically involved in the projects thanks to advanced project management skills.

#### 9. People management (Source: Deus Technology)

The course explores, from an economic and managerial perspective, the main topics related to people's behaviour inside organisations. In particular, the course will define the main relational, managerial, and self-management skills requested by companies in the current socio-economic context, with a focus on change and innovation skills.

Contents: aspects of diversity management; intercultural competences and management, employees satisfaction and engagement; organizational change, group dynamics and processes; individual differences and personality management; individual performance determinants: motivation and skills, organizational culture, organizational change.

#### 10. Negotiation principles (Source: Deus Technology)

This course will have the aim to explore all the main aspects that characterize the negotiation processes that are generated within and out the organization.

The course could integrate the following modules: communicating within organisations; negotiation skills, organisational processes, power and influence tactics, power dynamics and leadership.

#### 11. Marketing and communication effectiveness (Source: Deus Technology)

The course addresses the theoretical issues and operational implications present in the marketing discipline applied to the FinTech sector.

The topics covered could be:

- marketing processes in B2B and B2C markets,
- communication in business marketing,
- analysis and management of the customer portfolio, segmentation and prices strategies
- the differentiation of the offer through product and technological choices,



- the financial sector within the retail services in terms of composition, evolution, trends, customer journey and customer experience

#### 10. Venture Creation and Startup (Source: University of Cebu)

The intent of this course is to develop capabilities needed to conceptualize, create, execute and sustain entrepreneurial endeavor. Introducing to students to the key elements of venture creation process is the main objective of this course. It is expected that students will acquire entrepreneurial knowledge and develop entrepreneurial behaviors needed to create and manage a financial technology related business solutions. The following are the specifics which students will explore on: identification and exploitation of opportunities, evaluation of possible entrepreneurial activities, strategy formulation, research and feasibility study, business planning and implementation. The end goal of this course is to provide students the necessary skills to commercialize financial technology innovations.

#### 11. Tech Solutions and Finance Apps (Source: University of Cebu)

This course covers fundamentals on mobile application development. Developing requirement, design considerations and data handling are few of the major topics in this course. Specifically, the students will be exposed on the following: identification of business and technical requirements, mobile platform and usability, app visuals, database creation, loading, data collection and integration. At the end of this course, it is expected that students will be presenting the visual concept and business model of the proposed App. Graduate students coming from technical background may opt on creating a prototype or a beta version of their proposed App.