# **Chapter 2** **REVIEW OF RELATED LITERATURE AND STUDIES**

## **The Benefits of Continuing Education**

**Status of Continuing Education as a Whole**

Studying never ends after graduation. Meaning, those people who are professionals or to those who are working in the field of their expertise never stops studying, learning or adapting new skills and knowledge relating to their profession. Others may see it as a waste of time, or unnecessary, but continuing education as a professional is important, particularly to those professionals who needs to adapt to the new trends of their profession, and also to those professionals who need post-license in order to give services and to continue their profession.

Continuing education, according to Ramachandran (2016), continuing education is any extension of openings for reading, learning and training to professionals that are currently following their completion of or withdrawal from full time schooling. He also emphasized that continuing education is important so that the job aspirants are updated to the current trends of the technology, as the innovation for it is rapidly going off the charts. Also, he said that the continuing education is significant to those professionals that are in the field of fast changing industries.

Based on the news article by South University (2012), industries are continuously shifting, time by time, meaning, continuing education is important to those laborers who are required to stay with the current latest developments, skills, and new technologies in their respective fields. Also, it is said that some professions require continuing education to comply with laws and regulations, to remain licensed or certified, or to maintain membership in an association or licensing body. In general, continuing education is an alternative way for professionals to keep updated of their fields of expertise so they are not left behind (www.southuniversity.edu, 2012).

There are many benefits in continuing education. It makes the professional more qualified, it is because of undergoing in a schooling while working makes the professional more well-equipped with the knowledge of his/her field of expertise. Making more money is easier with this, but continuing education is an investment, meaning, a professional must spend a costly payment for it, before getting the fruits of labor. The professional will have more confidence, because continuing education promotes higher intelligence, meaning higher competitive edge among the others, giving the professional a look and picture of success. Continuing education also gives a better secured future and a better lifestyle, it is because of the higher experience, higher education, and higher salary gained from work. It also improves social and business network. Taking advantages of meeting people among educational meetings and scientific forums during the activities of continuing education can help the professional to produce more connections through communication with others, make peers and friends. Lastly, it improves one’s professional’s discipline, not only terms of work and education, but also as a person (www.chcp.edu 2014).

**Status of Continuing Education in the Philippines**

Continuing education in the Philippines can also be described as the other countries describes it, that for every country wants their locally produced professionals to be well-knowledgeable and equipped with the right skills and learnings in relation to their specific filed of expertise, so they help within the community, for their country, and to be globally competitive. But still, there is a difference of acceptance within the group of professionals in the Philippines, in terms of agreeing with the concept of continuing education.

San Luis (2017) mentioned that employers nowadays require, or if not really, prefer professionals that has specific skill set and has qualification to a specific body of knowledge institutions. For example, a project manager who are certified by PMPs.

But in order to achieve this kind of certifications, Filipino professionals must invest for it, meaning, they should pay the price that will deserve the certification. Continuing education is not really an issue for the Filipino professionals, but since mostly of the CPD programs are expensive, it lacks the interest of the professionals to continue education.

“If you’re a licensed professional in the Philippines, you must have gone through many hours of mandatory trainings and seminars just to earn continuing professional development (CPD) units to renew your license. While some of the seminars and workshops may be useful, many professionals have found them time-consuming, costly and even a waste of time, especially if they happen to have attended uninteresting or useless lectures.”

Regalado points out the word “mandatory”, because there is law, or a Republic Act that requires licensed professionals to undergo CPD programs to get the require units, for them to be able to renew their licenses.

As stated in the article by Hapal (2018),

*“The seminars and trainings under the Continuing Professional Development are expensive and are not easily accessible to busy professionals”.*

The highlighted topic of his article is that Filipino professionals are mostly bread-winners, meaning, they do not have the resources to spend for continuing education, also, they do not have the enough time to still undergo in such programs, that is why, he points out that the CPD programs are not that accessible to every professional. In Hapal’s article, OFWs are also affected in this, particularly those who practices their professions abroad, and still needed the licensure of the PRC in the Philippines. For them, it is really expensive and inappropriate in way that it is very hassle, time consuming, and expensive.

Reviewing the past articles, it can be seen that most of the Filipino professionals disagrees to the mandatory continuing professional development law, or also known as R.A. 10912, so some people wants to abolish it. CPD law requires all licensed professionals to undergo expensive CPD programs that will complete their required units, in order to renew their licenses. The House Bill 7171, which is filed by ACT Teachers Party-list Representatives Antonio Tinio and France Castro, proposing the repeal of the CPD Law, because they think that the law is anti-professional and unnecessary. To justify the proposed bill to revoke the CPD Law, the party-list representatives argue that the law,

*“forces professionals to spend thousands of pesos, take unpaid leaves from work, endure long queues, and go through other hardships. The law even effectively endangers the security of occupation of public-school teachers and other government employees…”*

as the proponents argued (www.pinoymoneytalk.com, 2018).

Despite of the bill proposal, the CPD law still exist and stands on its mandate, requiring every licensed professional in the Philippines to undergo continuing professional development programs, in order to be called a “qualified and certified professional”.

**Republic Act 10912 or Continuing Professional Development Act**

The Republic Act 10912, or also known as the *“Continuing Professional Development Act of 2016”* is an act that mandates and strengthens the continuing professional development program for all regulated professionals, the creation of continuing professional development council, and to appropriating funds and to its other related purposes. This act is created in purpose to promote and improve the practice of the regulated professions in the country, as stated in the article one, section two.

In the Article 1,Section 3, the terms used in the republic act is well defined, as it is needed in order to understand the meaning of the said act. It includes the definition of being a professional, being accredited and qualified, the kinds of learnings, and on how the CPD, or the Continuing Professional Development works in the country.

Republic Act 10912 Article 1, section 3, states that:

*“Continuing Professional Development refers to the inculcation of advanced knowledge, skills, and ethical values in a post-licensure specialization or in an inter-multidisciplinary field of study, for assimilation into professional practice, self-directed research and/or lifelong learning;”*

Meaning, the PRC, or the Professional Regulatory Commission mandates or requires every professional that needs license to operate or to take service, must undergo any CPD programs, in order to accumulate the units they needed, so they can re-new their licenses and to continue on their profession. PRC programs are seminars, workshops, technical lectures, scientific meetings and tours, that are accredited by the CPD Council – a group or a governing body that endorses and ensures continuous development of professionals in agreement with the set standards in regional, national, or international standards of practice.

In the Article 2, Section 4 of the Republic Act 10912, it is stated that Filipino professionals must be well-equipped by their knowledge, to be able to compete globally. The CPD act of 2016 must ensure that the professionals must continuously learn and train in accordance to their specific field of work and study, to assure the quality of services, given by the Filipino professionals around the nation and around the world.

As stated in the Article 2, Section 5, professionals shall undergo to the following activities in order to be accredited and qualified, and it includes formal learning, non-formal, informal, self-directed, online learning activities and professional work experience, but according to the Republic Act, they are not limited to those activities, meaning, it can be more than that.

In the Article 2, Section 6, 7, 8 and 9, only explains on how the PRC and the CPD council will work in order to enforce and accomplish the objectives of the said act. In the article three, it explains the implementation and monitoring of the CPD programs, in accordance to the recognition of credit units and the career progression of a certain professional, and also, on how the role of the government agencies and private sectors will affect the implementation, and on how they will help in monitoring the said act.

And lastly, according to the Article 4 of the RA 10912, it highlights the effectivity and funding of the said act, and the dissemination of its implementing rules and regulations to the public within 6 months of effectivity.

**Implementing Rules and Regulations of Republic Act 10912**

In pursuant to Section 15 of Article 4 of the Republic Act 10912, the implementing rules and regulations are promogulated by the PRC and PRB, in consultation with the CPD council to execute and monitor the said law. The implementing rules and regulations of RA 10912 main purpose is to guide the governing body of continuing professionals on the implementation of the said law. The IRR of RA 10912 contains the outlined and specific details of the RA 10912 ways of its implementation, procedures, and its rules and other regulations.

As stated in the Rule 1 of the IRR of RA 10912, it details the definition of terms to be used across the document, so that any reader would understand the association or words used in the document. In the Rule 2, it details the objectives of the CPD Programs, the CPD council and the secretariat’s job in terms of implementing the said law. In Section 8 of Rule 2, the powers, functions and responsibilities of the CPD Council are breakdown into several sub sections in order to classify and specify the limitations and capabilities of a CPD accreditor and providers.

As stated in the Rule 3, Section 10 or the CPD implementation and monitoring,

*“The CPD is hereby made as a mandatory requirement renewal of the PICs of all registered and licensed professionals under the regulation of PRC”.*

In this section, it details the rules and regulations on how should a professional gets his/her credit units. And lastly in the Rule 4, rules and regulations about funding, operational guidelines, frauds, separability, repealing and effectivity are stated.

The promulgation of the IRR of RA 10912 is important because it will serve as guide and basis for enforcement. not only to the governing bodies of the professionals, like the Professional Regulatory Commission, Professional Regulatory Board, and the CPD council, but also, to those licensed professionals, aspiring job seekers, and to those people who still continuing their education.

**Other Related Supporting Technologies**

PRC Government Agency (2018), the online system approved this year named as the Continuing Professional Development Accreditation System (CPDAS) which the professionals can submit the application form and the approval of CPD providers and seminars. This will also allow the providers to submit their seminar attendances and can track the status of the application through this system website and updated via email.

Based on the study by Razak R. et. al (2015), the Electronic Continuous Professional Development (E-CPD) for teachers is a Turkish Online Journal of Educational Technology which provide training for primary school teachers through online. E-CPD goal is to identify the activities that happen at every level of Bloom Taxonomy with the Zone Proximal Development activity in E-CPD. The system can monitor the teacher’s status and helps the teachers to apply their learning to reliable workplace situations to develop on-the-job performance.

The Air Technology System (ATA) is a website application system that provide accredited training, events and workshop that suitable for CPD professionals. The CPD Certification Services module offers CPD training courses, e-learning programs, events, workshops, seminars, and conference are formally accredited and available. It supports the CPD policies of institutional and professional organizations on a progressively global basis. The system can request CPD Certificate and can search the CPD member directory for industry experts and accredited providers from across the sectors.

The Royal Institution of Chartered Surveyors (RICS) is an online system that accredits professionals inside the property, construction, land and infrastructure sectors worldwide. It is upholding the professional standards, offers training and events, search qualified professionals and give an assessment status of their applicant. RICS helps professionals to constantly improve their skills and knowledge in order to stay their professionally competent.

Render from the sources of EU-CME site, the Continuing Medical Education (CME) system has the same purpose with Continuing Professional Development (CPD) which to keep physicians updated in their medical practice and having a learning commitment to their patients and society. The system designed to deliver information that is both applicable and essential to medical services. CME programs followed on the current educational principles that help the acquisition of knowledge while promoting professional integrity, high ethical standards and efficiency.

Rider S. (2018), the use of new and modern technologies that comply by the law has offered the opportunity for educating the professionals to manage their time, resources and money if they are well informed of the technologies that exist to support the daily operations and processes. The use of technology is use for evidence, creating and managing digital practice, the ease to use and monitoring the status.

Mather (2017), governing mobile technology for continuing professional development (CPD) in the Australian nursing profession helps nurses to be guide and gives direction regarding professional standards to support mobile technology for mobile learning. It also allows the nursing profession to be leaders in establishing mobile technology in healthcare environments globally and nationally.

## **Issues and Concerns on the Implementation of Republic Act 10912**

**In terms of Affordability**

Based on the Philippine Inquiry News (2017), the implemented rules and regulations show some issues and concerns of the professionals especially those who are unemployed, underemployed or who receive low wages and contractual employees or casual may not be able to afford the seminars, courses or trainings that is needed to obtain continuing professional development units for the renewal of their professional identification card.

In this situation of the underemployed, contractual or casual employees, they are still having opportunities to earn free CPD units, like seminars and in-house trainings. The Professional Regulation Commission (PRC) was coordinated to all government agencies, GOCCS and SUCs to apply as Continuing Professional Development (CPD) providers. In exchange for offering free seminars and training to their employees, the Professional Regulation Commission will surrender their registration fee as well as the accreditation fee for their Continuing Professional Development programs. The PRC will ask the AIPOs and APOs to giving free trainings and seminars to their members as part of their social responsibility.

Last, in case the professional is unable to comply with the 30% required CPD units from July – December 2017, they will be permitted to renew their PIC upon completing complete the required CPD units for the compliance period.

Bernal H. (2018) as a professional teacher, he said that the process of renewal of Professional Teacher’s License is a corruption and unjust because of the expensive CPD units’ programs and seminars, there are also renewal fees and other documents such as the certified copy of Transcript of Records (TOR) and diploma which had a processing lead time of 60 days. In this procedure, Bernal complaint and fell that the process system of PRC for renewing the license of professionals is inhuman, corrupted and slow process procedures. This complaint was viral on Facebook that quickly answered by the PRC.

One of the news published on August 2017 entitled *“Professionals need not spend to comply with CPD – PRC”* by Medenilla S. caught an attention to all the professionals as the PRC explained that the professionals could comply with the CPD requirement without spending a single peso through the employers.

Summit Express (2018), since the viral issues receiving over 50,000 reactions and 60,000 shares online happened on social media against in implementation of Continuing Professional Development as a requirement for the renewal of PRC license the PRC breaks the silence on CPD Law issues and said this is a fake news. The PRC denounced the complaint of the complainant on social media and explained that no professional applying for renewal of his professional ID was rejected especially if it was incomplete or inadequate in CPD units and the process of renewal of license was followed based under on CPD Law.

Pasion (2017), said to have a professional license renewed under the new rules here in the Philippines professionals would have to shell out thousand’s worth of extra cash every 3 years. The units will be acquired through development programs such as online courses, graduate studies, seminars and etc. They come with costs, of course. This issue was pushed all the professionals to have a petition and more than 50,000 professionals have signed an online petition to please review of the law.

**In terms of Accessibility**

Trillanes (2017) explained about the issues of the professionals assigned in far areas have less contact to PRC especially for accredited institutions and are compelled to travel to major cities just to process their requests and finish the needed CPD units. As for professionals working in overseas and remote areas, the PRC will persuade CPD providers to suggest trainings, seminars and online courses with the essential valuation instruments. Mother chapters of AIPOs and APOs may also document seminars organized and distribute these materials to abroad chapters and remote local chapters. For the professionals employed overseas, a device is being prepared to identify their in-service trainings and seminars provided by their employers.

In addition, the percentage needed for each studying track require not be exactly obeyed if the entire number of required CPD units is matched. They may also take CPD-related courses and seminars from non-accredited institutions in their host country and have the CPD units accredited under the self-directed modality.

Medenilla (2017) review the PRC issues of CPD exemption guidelines, it is said that the professionals who work overseas or victims of calamities, can be temporarily exempted from submitting the CPD units for the renewal of the professional identification cards. This privilege to all professionals who may be unable to gain enough the CPD units on time due to have *“justifiable reasons”* that will determine by the Regional directors.

**Professional Regulatory Commission Accredited Continuing Professional Development Providers**

According to Trillanes (2017), The Professional Regulation Commission recognized CPD providers are restricted to current providers which are private institutions and the accredited integrated professional organizations (AIPOS) or accredited professional organizations (APOs), the training and seminars they provide remain costly and limited to few accredited training institutions. As the implementation of the CPD law is still in its early phases, certain professions have only a few CPD providers. This has controlled CPD providers to gain of the law of supply and demand. The PRC, done by the CPD councils, is therefore increase speed the processing of applications for CPD programs and providers.

The accusation by complainants, critics and some common online petitions that,

“the PRC does not recognize in-house training by government agencies such as the Department of Education (DepEd) and other companies, which are already instituted and free…”,

is untrue – said by Trillanes. The PRC has never made announcements to that effect. In fact, the PRC will recognize programs which may be credited under the self-directed modality even if not from an accredited provider if it is proven that they enhance professional development.

According to Hernandez, the OIC official of the PRC, according to the provisions of Republic Act No. 10912 of the CPD Law, which states that all private and government, must include the CPD as part of their human resource development program where the company must pay 5,000 pesos for accreditation within 3 years. Then their human resources could apply each of their seminar or programs for 1,000 pesos.

**Professional Regulatory Commission procedures on the evaluation of license renewal**

In general, issues and concerns against the implementation of RA 10912, as review from the Philippine Daily Inquirer’s article of its interview with Hon. Sen. Antonio Trillanes IV and P.S. Res. No. 441 of the Senate of the Philippines dated on 25th of July 2017, PRC procedures on evaluation of license renewal was not easy to pass.

Republic Act No. 10912 known as the *“Continuing Professional Development (CPD) Act of 2016”* is an act which requires CPD as the mandatory requirement for the renewal of professional identification card. The requirement of CPD units for the renewal of PIC has a general transitory period which is within 3 years of compiling which is expensive and difficult to achieve. This implementation of RA 10912 for the evaluation of license renewal was composed of three issues such as the affordability and accessibility in acquiring CPD units.

The professionals especially those who are unemployed, underemployed or who receive low wages and contractual employees or casual may not be able to afford the seminars, courses or trainings that is needed to obtain continuing professional development units for the renewal of their professional identification card. Also, the professionals who are in remote areas and overseas have less access to PRC-accredited institutions and are compelled to travel to major cities just to process their applications and complete the required CPD units.

Medenilla (2018) explained that PRC was undertake a review of CPD law’s operational guidelines amid complaints especially of the issues on the procedures for renewing PRC license. It issued the clarification after an “inaccurate and misleading” stories claiming the CPD Law has already been abolished by Sen. Antonio F. Trillanes IV spread in social media last month.

“In a recent Senate hearing, Sen. Antonio Trillanes IV never made declare of stopping the CPD Law, but in fact, directed PRC and the CPD Councils to continue public hearings and consultations with stakeholders to develop implementation processes…”,

based on the statement by the PRC.

Based on the article of Pasion (2017), to have a professional license renewed under the new rules here in the Philippines professionals would have to shell out thousand’s worth of extra cash every 3 years. The units will be acquired through development programs such as online courses, graduate studies, seminars and etc. They come with costs, of course. This issue was pushed all the professionals to have a petition and more than 50,000 professionals have signed an online petition to please review of the law.

## **Automated Continuing Professional Development monitoring systems in the issuance of licenses/renewal**

**Practices and Procedures of other countries**

In a study funded by the European Union (2013), CPD is being mandated across European Union and European Free Trade Association (EU/EFTA). Mandatory CPD systems are implemented across European countries, since mandatory CPD became the “most common model” for most of the professions, in most of the EU/EFTA countries. Precisely, five professions are for mandatory CPD in 13 out of 31 countries, such as Austria, Croatia, Czech Republic, Finland, France, Hungary, Italy, Latvia, Lithuania, Romania, Slovakia, Slovenia, and the United Kingdom, although it is not mandatory for Denmark, Estonia and Sweden. The implementation of mandatory CPD is usually enforced by national law.

CPD requirements, however, differ for professionals, which involve their history of employment. Some professionals have the responsibility to undertake additional hours (depending on what profession they are practicing) to renew their licenses. This is the case for Lithuania. In France, CPD activities are contingent on the duration of mandatory CPD for doctors, in which it is agreed upon, and varies according to medical specialty.

In Colombia, professions are rigorously regulated and is only approved by a professional council (for a corresponding profession) for professionals to practice within the vicinity of Colombian territory.

On the other hand, the North Carolina state of the US is made available online for counselors who are applying for licensure renewals. They are obliged to pass requirements such as the renewal form, Ethics Attestation Statement, Professional Disclosure Statement, Jurisprudence Exam Certificate of Completion, and a renewal fee of $200, if they are not selected for audit. In addition to that, forty (40) contact hours of continuing counselor education, a minimum of three (3) contact hours of ethics, and credits earned between July 1st and the second June 30th unless the applicants are new licensees (North Carolina Board of Licensed Professional Counselors, 2017).

In Asia, CPD requirements to be complied for health professions varies on each country. Brunei Darussalam regulates their CPD on a point basis, which is a minimum of 30 points before professionals can be subject to renewal of registration and certificate, which is done annually. Furthermore, Brunei has ten (10) categories of CNE/CPD Education activities where CPD activities can be classified. Cambodia, however, follows a different approach in the equivalence of CPD points (in this case, Cambodia refers to CPD points as credits). Value of credits depends on the category of CNE/CPD education activities; for example, for attending courses like training, workshops, seminars, conventions, etc., a professional earns one (1) credit for eight (8) hours of attendance. Thus, a nurse applying for relicense in Cambodia must accumulate 12 credits per 3 years to be able to grant a renewal of license.

Pointing system is the unit of measure for Indonesia in allotting credits for renewal of license for nurses. A nurse who has done speakership acquires 3-5 points. Some who are administrators obtain 2-3 points, and a participant accumulates 1-13 points. With this, the professionals are subject for renewal of registration and certificate, with 25 points valid for 5 years.

**Systems with similar operations/features**

The Actuarial Society of South Africa offers a different continuing professional development output-based system, which is currently being adapted to replace the current time-based system. Its features include building a development portfolio over time, keeping own records, and thus, help the professionals focus on learning and development than counting the hours needed to complete the CPD.

On the other hand, Agylia CPD management software allows its users to keep track of their learning activities and formal learning resources. A personal development tracking, to be precise. Furthermore, uploading of certificates of completion, results certificates, or other documents supporting their independent learning is made possible with Agylia, to validate their CPD activities. Agylia allocates CPD points with its rules engine, based on numerous and varying learning activities, results, and behaviors. Also, it enables users to assign tasks to people or groups which must be completed to meet the CPD goals requirements. Agylia also has mobile learning applications, which have notifications, send timed communications and reminders, and CPD reports for monitoring progress and completions, all to minimize the managers and administrators’ workloads. Lastly, Agylia capacitates users to award personalized certificates, automate and send reminders (or escalation emails) to individuals (and managers) who have completed CPD activities.

Arlo Professional Development (CPD) Management software provides its users with CPD courses and events features, such as taking online registrations, payment, reporting of CPD points, and sending achievement certificates to CPD regulating bodies. One of its highlights is the online registration feature made available to professionals. Basically, Arlo CPDMS includes all the tools that can aid its users, right from accepting and managing registrations online, payments, and invoicing their continuing professional development courses and events, with a customizable registration form. Users can make copies of their invoices to their accounting systems.

On the other hand, CPDplus is a continuing professional development management system that focuses on the earning, and tracking of CPD points, while being a learning management system at the same time. It includes a progress bar which shows the users their current tracks with their CPD points in preparation with their training plan total requirements in a year. The interface displays the CPD point acquired, and the time used by the professional, and also, the remaining points that are still required and the days left for the professionals to accomplish earning their CPD points.

Me Learning, however, focuses on continuous professional development tracking of activities than learning management systems. This particular CPD system helps professionals to keep a record of their CPD activities and manage them. This makes its users save time and effort in tracking their CPD progress and accomplishing their CPD learning requirements. Me Learning CPD tracking system provides the users with a similar interface with that of CPDplus, only with Me Learning displays a chart-like graphical representation of the user’s progress, with accomplished CPD hours highlighted in green, and the total required hours colored in red.

Furthermore, Med-Bay.com offers a CPD management system, however, it is hosted online. This system puts emphasis on storing certificates online to users’ personal profiles by allowing them to upload their certifications and achievement credentials until they are required for audit.

JobStreet.com, although not a CPD system, has a similar concept when it comes to recommender algorithms. It suggests job training postings or job openings to users by matching its preferred specializations, educational background, and skills with the nature of the work being opened by companies.

Eventbrite, an event management (and ticketing) website which is based in the United States, also uses a behavior-based recommendation system to suggest events to users who have their own preferences in attending events. On March 7, 2016, according to Eventbrite’s blog post, it is said that they were building

“An Elastic search-powered, content- and behavior-based recommendation system to match users with events they are sure to enjoy.”

## **Algorithms used to match professionals with available accredited trainings**

**Similar algorithms and their unique differences**

Based on the gathered data, the matched technique needed to use is the topic modeling. Topic modeling is a powerful approach for analysis of a large collection of documents. According to Barde et al. (2017), it is used for finding hidden structure from the collection of a document. A topic contains a group of words that often occurs together. Topic modeling can differentiate across the uses of words with dissimilar meanings and link words with the same context. There are 4 methods of topic modeling which includes Latent Semantic Indexing (LSI), Vector Space Model (VSM), Probabilistic Latent Semantic Analysis (PLSA) and Latent Dirichlet Allocation (LDA).

Selivanov (2017) explained the topic modeling as a technique to obtain conceptualize topics from a collection of documents. He discussed the features between the Latent Semantic Analysis and the Latent Dirichlet Allocation. The Latent Semantic Analysis is easy to train, tune and usually work fine in downstream task such as regression, classification, similarity-search and clusterization in a small collection of documents while the Latent Dirichlet Allocation can be quite fast to train in a very large collection of documents.

Nair (2016), the topic modeling helps in determining unknown topical patterns that are existing through the collection, annotating documents according to the given topics and applying the annotations to search, summarize texts and organize. It is supposed as a form of text mining in a way to find repeated patterns of words in textual material. He explained the 2 effective techniques in how they work of topic modeling, the Latent Dirichlet Allocation and TextRank. He said that the Latent Dirichlet Allocation reach a steady where topic assignments are pretty good while the TextRank is a method allows to obtain relevant keyphrases for every document in the collection.

Formed on Li’s (2018) article, the Latent Dirichlet Allocation is one of the popular topic models and used to categorize text in a document to a specific topic. It constructs topic per document model and words per topic model. Topic modeling is a kind of statistical modeling for determining the abstract ideas that happen in a collection of documents.

Alghamdi et al. (n.d.) discussed the descriptions of high-level view of some topics that relates to topic modeling in text mining. He explained the differences of the 4 methods in terms of theoretical backgrounds, characteristics and their limitations. Also, it has been mentioned that each of these four methods has improved and modified over the previous one. Model topics without taking into account ‘time’ will confound the topic discovery.

**Theory and Application of Big Data**

Zerhari (2015), big data is typically described by three features called 3Vs (Volume, Velocity and Variety). It concerns to data that are too big, dynamic and difficult. In this framework, data are hard to manage, capture, store and evaluate using old-fashioned data management tools. Therefore, the new conditions executed by Big Data present important tests at different level, comprising data clustering.

Satell (2013) discussed why big data matters to all of us. According to him, big data can generate big brainstorms and very important because it will change how we manage our business. Nowadays, millennials business leaders trusted on *“scientific”* studies and *“statistical significance”* to conclude what data could believe. Currently, technology is creating those expectations obsolete and the practice of an organization will never be the similar.

**Use of the selected algorithm in Big Data**

The selected technique in topic modeling for Big Data is the Latent Dirichlet Allocation that can generate statistical model matched to use in this research. According to Ha-Thuc and Srinivasan (n.d.) Latent Dirichlet Allocation has been highly discovered, especially for finding a topic from a corpus. His study made a relevance-based language model from the said method by estimating the

The study of Shakeel et. al (2018) created a framework named URDU language topic modeling using the Latent Dirichlet Allocation method. Because of some standard of LDA and it’s appropriate to make a framework for topic modeling, they named the new model as Urdu Latent Dirichlet Allocation (ULDA). The experimental results show the dominance of the proposed ULDA models as compared to existing systems. The work is carried out for the first time in Urdu Language.

Discussed on the research of Maier et. al. (2018), their research goal is to make Latent Dirichlet Allocation topic modelling more available to communication researchers and to guarantee agreement into disciplinary standards. According to them, using LDA to textual data, researchers require to undertake four major challenges that modify these conditions: (a) adequate selection of model parameters, including the number of topics to be generated (b) appropriate pre-processing of the text collection (c) the process of validly interpreting the resulting topics and (d) evaluation of the model’s reliability.

Accumulated from the study conducted by Nikolenko et. al. (2014), the study entitled “Measuring Topic Quality in Latent Dirichlet Allocation” explained that Latent Dirichlet Allocation is the modern model of choice for topic modeling. It is an approach to text classification as one document belong to one topic. It also a probabilistic model that can extracts topics from the corpus of documents and the quality of LDA shows better.

## **Meta Data Search**

Gregory et. Al (2017) explained that searching data is a criticism of observational data recovery practices in particular disciplines. A cross-disciplinary test of the user behaviors concerned in seeking and assessing data is surprisingly lacking from the research data analysis. This study searches the data retrieval literature to recognize unities in how users search for and assess observational research data in chosen disciplines. Two analytical frameworks searched in information retrieval, science and technology studies are expended to recognize key similarities in practices as a primary step toward elaborating a model defining data retrieval.

Yang L. and Perrin J. (2017), Digital repositories and digital collections have enlarged in recent decades in research libraries and academics. As digital items are place into digital repositories in organize to be learned by search engines, related metadata records must be efficiently set up for external indexing. This special problem aims to study these approaches and suggest insight into the current literature discussion digital collection metadata and its discoverability through Internet, thereby suggesting a platform for researchers to deliberate metadata strategies, digital repositories, digital formats, search engine indexing, and Internet discovery. This article is entitled, *“Introduction to the Special Issue of Digital Collection Metadata and Internet Discovery”.*

Venlet J., Farrell K., and Kim T. the metadata is depends on the end users and the needs of metadata practitioners. The OCLC Research Library Partnership Web Archiving Metadata Working Group was developed to recommend descriptive metadata best follows for archived web content that would meet end-user needs, improve discovery and enhance metadata uniformity. This review describes types of end users, the need for support services, discovery interfaces, their research methodologies, barriers to use and outreach. The review of practitioner literatures tackles the need for accessible practices, the standards and shared practices currently in use, the outcomes of a variety of case studies and other methods to metadata.

Cronin P., Ryan F., and Coughlan M. (N.d.) was present a literature review in a step-by-step approach. It demands a complex range skill, such as acquiring skills of literature searching and retrieval, often within a limited time scale, learning to define topics for exploration and developing the ability to analyze and synthesize data as well as becoming adept at writing and reporting.

Based on the conducted study of Hemminger B. and Saelim, B. (N.d.), the researchers have usually used bibliographic files to seek out information. Today, the full-text of resources is progressively open for searching, and more researchers are presenting full-text searches. Meaningfully more articles were exposed via full-text searching; however, the accuracy of full-text searching also is pointedly lower than that of metadata searching. Specific features of articles connected with higher significance ratings. By using the number of hits of the search term in the full-text to rank the importance of the article, performance of full-text searching was improved so that both recall, and precision were as good as or better than that for metadata searching. This suggests that full-text searching alone may be sufficient, and that metadata searching as a surrogate is not necessary.

## **ISO 9126**

Djouab et al. (2016), the ISO 9126 is the most familiar and useful quality standard to identify and assess attributes of the software product. It is also extended with the particular characteristics of the e-learning software product. This extension was defined by the quality characteristics of the e-learning system and integration it to the ISO 9126 model. The appearance of the information and communication technology in university has contributed to the development of the e-learning systems.

Chua et al. (n.d.), regardless the extensive use of e-learning systems and the large investment in developing, there is no agreement on a typical framework for assessing system quality. This study proposes the ISO 9126 Quality Model as a helpful tool for evaluating such systems, particularly for professors, instructors and education administrators. It also discusses the validity of the model in a case study in which it applies to a commonly available e-learning system and show how it can be used to find design flaws.

From the gathered data by Alashqar et al. (2015), the ISO 9126 as a quality model evaluation was very important and essential issue in the development process because it helps to bring a competitive software product. This process is a considered multi-criterion of decision-making processes by selecting the best software based on quality attributes where there are interactions among criteria. It presents and develops quantitative evaluations by considering interactions among criteria in the multi-criterion of decision-making issues. The evaluation experiments are depending on real data collected from case studies.

Miguel et. al (2014) explained that software products were very in use nowadays and measuring and evaluating the quality of software product that indicates in ISO 9126 has become a critical task for many companies. There are several models have been proposed to support different types of users with a quality problem. It also said that the development techniques for building software influenced the creation of models to assess the quality. It introduced new concepts such as reusability, availability and configurability, better quality and lower cost.

According to Moumane et al. (2016) with the use of ISO 9126 – Software Quality Standard, it is very efficient to evaluate framework to develop such mobile applications. This study aims to evaluate mobile environments especially the usability and efficiency of characteristics.

Alves et al. (2010) discuss the methodology for assessment the database according to ISO 9126. Research Group on Sotware Engineering implement the design and test and also the instrument for quality inspection complying with the ISO 9126 standard. The main impacts were the invention and execution of indicators, supported on metrics, for a decision process, which are created on the construction of a quality assessment methodology for a software product, in a model of information system; and a prototype of an instrument for quality, which involves the approach measures in the definition of quantitative and qualitative metrics, by using of a Microsoft Excel spreadsheet.

## **Synthesis of Reviewed Literature and Studies**

The continuing education is important for those professionals that are still practicing their knowledge and practical skills, particularly to those in the fast-paced industries, meaning these professionals must cope with the rapid change and innovation in the workplace industries.

The current state of the Filipino professionals in terms of continuing their education seems to be declining, because of the expensive CPD programs that are offered to them. Meaning, some licensed professionals neglect to renew their licenses because acquiring units through CPD programs are time-consuming and expensive, which makes the PRC mandate to be ineffective and not interesting to the Filipino professionals.

There are different opinions from different countries in using automated systems for CPD purposes, like license application and renewal. There are many available applications, both web and mobile are available in some countries, with this, the licensed professionals that are in favor of this.

By analyzing the issues and after finding the information in relation to big data and the selected algorithm, the researcher formulated the relevance and importance of using this concept to improve the current system of automated CPD monitoring systems. With the help of meta-data, the number of results in data-mining can be more optimized and accurate, and at the same time, it will produce more results.

Lastly, the ISO 9126 will be a basis for the software development phase of the application system tool. This standard will guide the developers to produce a quality software that will give the satisfaction to its users, particularly, to those professionals that are continuing their education and professions.